Final
Environmental Impact Report/ Environmental Impact Statement

Southern California Edison's
Eldorado–Ivanpah Transmission Line Project

NOVEMBER 2010

VOLUME I

State of California
Public Utilities Commission

A.09-05-027
SCH #2009071091

Bureau of Land Management
Needles Field Office

FES-10-56

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STATE OF CALIFORNIA
PUBLIC UTILITIES COMMISSION
555 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

ARNOLD SCHWARZENEGGER, *GOVERNOR*

NOTICE OF AVAILABILITY

FINAL ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT
ELDORADO–IVANPAH TRANSMISSION PROJECT
PROPOSED BY SOUTHERN CALIFORNIA EDISON COMPANY
APPLICATION NO. 09-05-027

To: All Interested Parties
From: Monisha Gangopadhyay, California Public Utilites Commission, EIR Project Manager
Subject: Notice of Availability, Final Environmental Impact Report / Environmental Impact Statement for the Eldorado–Ivanpah Transmission Project
Date: November 5, 2010

The California Public Utilities Commission (CPUC) and the Bureau of Land Management (BLM) have prepared this Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for consideration of the Application (No. 09-05-027) filed by Southern California Edison (SCE) for the proposed 230-kV Eldorado–Ivanpah Transmission Project (EITP). The Final EIR/EIS has been prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) and incorporates changes resulting from comments submitted during the 45-day public comment period for the Draft EIR/EIS that was published April 30, 2010 which concluded on June 26, 2010. The original Application for a Certificate of Public Convenience and Necessity for the project was filed by SCE on May 28, 2009.

A. Description of the Proposed Project and Location

The EITP would upgrade approximately 35 miles of existing single-circuit 115-kV subtransmission line to double-circuit 230-kV transmission line between the Ivanpah Dry Lake area and the existing Eldorado Substation, construct a new substation (Ivanpah Substation), install upgrades within the existing Eldorado Substation, and install a redundant telecommunications path between the Ivanpah and Eldorado substations. The redundant telecommunications path would be strung along the existing 500-kV Eldorado—Lugo transmission line for approximately 25 miles before it would be installed in a new underground duct for approximately 5 miles along the northern edge of Nipton Road to a new microwave tower outside Nipton, California. The EITP would be located in Clark County, Nevada and San Bernardino County, California near Primm, Nevada.

B. Contents of the Final EIR

The Final EIR/EIS consists of two volumes completely reprinted from the Draft EIR/EIS. All appendices are available as a separate CD, Volume 3. Changes made to the Draft EIR/EIS are marked in Volumes 1 and 2; inserted text is underlined and deleted text is shown in ~~strikethrough~~. There were 15 comment letters received on the Draft EIR/EIS.

The Final EIR/EIS documents the evaluation of 19 alternatives, including the No Project/ No Action Alternative. Alternatives are described and screened for compliance with CEQA and NEPA in the Alternates Screening Report (ASR) in Appendix A, then summarized in the Final EIR/EIS in Section 2.3: Project Alternatives. Alternatives that meet the CEQA/NEPA criteria are analyzed along with the proposed project in 13 environmental issue areas in Chapter 3 of the EIR/EIS.

The EIR/EIS identifies feasible mitigation measures in each resource area analysis in Chapter 3 and in the Mitigation Monitoring Plan as defined in Section 9. These mitigation measures, if adopted, would avoid or minimize impacts of the proposed project and alternatives.

C. Changes Made to the Draft EIR/EIS

In response to comments on the Draft EIR/EIS, changes have been made to the project description. None of these changes led to an increase in the significance or severity of a CEQA or NEPA impact determination. Revised information is indicated below.

- **ISEGS Whole of the Action Description:** The ISEGS project description is now updated based on the recent CEC Final Decision and BLM FEIS and ROD. The ISEGS Mitigated Ivanpah 3 Alternative is now discussed in this document since this alternative replaced the original proposed project in the ISEGS CEQA and NEPA environmental review documents.
- **Clarifications on Grid Interconnection:** The ISEGS/EITP interconnection is now further described in response to comments and new information provided by the applicant.
- **Land Disturbance Values:** Corrections have been made to the land disturbance values presented for spur/access roads, helicopter staging areas and construction yards, undergrounding, and temporary disturbance from the 33-kV distribution line.
- **Microwave Site Listed in Project Description Summary:** The microwave communication site is now described as a telecommunication component in the project description summary. The microwave site was previously described and analyzed in the Draft EIR/EIS but had been left out of the summary.
- **Potential EITP Users Clarified:** Text is now included that clarifies that EITP may connect other sources of energy to the grid in the future and not just solar generation.
- **115-kV Subtransmission Line Clarification**: Text is now included that clarifies that a piece of the existing 115-kV transmission line from Mountain Pass will remain and will terminate at the Ivanpah Substation.
- **Underground Fiber-optic Cable Segment Lengths**: Adjustments have been made to the lengths (~2 miles in Nevada and 3 miles in California) reported for the fiber-optic cable segments.
- **Underground Alert Service**: Updated Underground Alert Service information is now provided for Nevada.
- **33-kV Distribution Circuitry Adjustments**:
  - The applicant revised the description of voltages of the EITP distribution lines (from 12-kV to 33-kV), and this information is now included in this document.
  - The lengths of new ducts and circuitry required are now updated (400 feet of new ducts, 1-mile segment of circuitry).
  - Underground/overhead line lengths are now updated: 5,200 feet underground and 5,900 feet overhead.

- **Access and Spur Roads Lengths Adjusted**: The applicant revised the description of the access roads and spur roads. The updated values are now incorporated: 1.7 miles of new spur roads (originally 1.2 miles) and 1.2 miles of new access roads.
- **Transformer banks at the Ivanpah Substation to reflect current CAISO recommendations**: The proposed Ivanpah Substation now includes two 280-MVA 230/115-kV transformer banks (originally three) and three 230-kV lines in the switchrack (originally five).
- **Transformer Installation:** The applicant now intends to install the transformers by truck (towing) instead of using cranes.
- **Helicopter staging areas**: The applicant revised the description of HS-1. The size of HS-1 has been adjusted from 3.6 to 5.0 acres.
- **Water usage:**
  - The applicant provided new information on water usage and water source:
    - Construction: water will be sourced from wells owned by Molycorp, Minerals, LLC.
    - Operations: no water will be used for routine line washing.
- **Erosion control**: An updated erosion-control description has been added.
- **SF_6 recovery procedures**: Additional information on SF_6 recovery procedures provided by the applicant has been added to the document.
- **Type of fuel to be used in emergency generator:** Additional information on fuels provided by the applicant has been added to the document.
- **Fuel truck use and spill containment procedures**: Additional information on fuel truck use provided by the applicant has been added to the document.
- **Area Transmission Lines:** Corrections to maps and references to transmission lines crossed by the proposed EITP route have been made.
- **Non-transmission Alternatives:** Expanded discussion of the in-basin generation and demand-side alternatives were included in response to public comments to the DEIR/EIS.

In two cases, new information provided by the applicant on the project after the publication of the DEIR/EIS led to a reduction in the significance or severity of an impact under CEQA and/or NEPA. These instances are described below.

IMPACT HYDRO-2: Lowering of Water Table of Interference with Aquifer Recharge.

IMPACT PUSVC-2: Project construction temporarily increases water use, and project operation contributes to increased long-term water consumption.

These impacts were determined to be significant in the DEIR/EIS. When the draft was published, the source of the water to be used for dust suppression during construction was unknown. The water supply in the proposed project area is limited, and therefore there was a possibility that the impact on groundwater supplies could be significant. After the DEIR/EIS was published, the applicant submitted information on water supply that included a designated source, wells owned by the Molycorp Mine. This information was incorporated into the hydrology and water quality analysis and the public services and utilities analysis. The updated CEQA determination is less than significant with mitigation for both of these impacts. The potential for lowering local groundwater levels during project construction would be negligible, localized, and short term.

D. Significant Adverse Environmental Impacts from the Proposed Project

The Final EIR/EIS has identified significant and unavoidable adverse impacts on biological resources and air quality that would result from construction, operation, and maintenance of the proposed project. Under NEPA, the proposed project would result in major, adverse and unavoidable impacts on aesthetics and visual resources for one of the eight KOPs analyzed; with mitigation, impacts on aesthetics and visual resources would be less than significant under CEQA. All other project impacts were determined to be less than significant, or can be reduced to a less-than-significant level with the implementation of the mitigations measures listed in the Final EIR/EIS. No portion of the EITP would be located on a hazardous materials site pursuant to Government Code Section 65962.5.

E. Environmentally Superior Alternative

Alternative 1, the No Project / No Action Alternative, would be environmentally superior to the project on the basis of the minimization or avoidance of physical environmental impacts. However, this alternative would not meet the proposed project objectives. Section 15126.6(e)(2) of the State CEQA Guidelines states that "the EIR shall also identify an environmentally superior alternative among the other alternatives." In terms of effects on the environment, it has been determined that the environmentally superior alternative is the proposed project as it would have less temporary and permanent land disturbance, less significant impacts on sensitive biological resources, and meet all of the project's objectives. The Whole of the Action, which includes the ISEGS project, does not impact this determination as the differences among EITP alternatives relate only to EITP and not to ISEGS. However, this alternative would still result in significant and unavoidable impacts to desert tortoise habitat and air quality, under CEQA. Taken together with ISEGS, this alternative would result in significant and unavoidable impacts on several sensitive plant species (biological resources) and visual resources. The two projects also contribute to significant and unavoidable cumulative impacts on land use.

F. CPUC Actions After Final EIR/EIS Publication

There is no comment period following issuance of the Final EIR. The CPUC will determine the adequacy of this Final EIR, and, if adequate, will certify the document as compliant with CEQA. After the December 2010 Public Participation Hearings (described below), Evidentiary Hearings will be held at the CPUC offices. The CPUC will issue a Decision on the proposed EITP, which will be announced and published concurrent with a scheduled CPUC Meeting. The final decision is expected in December 2010. Within 30 days after the Decision is issued by the CPUC, parties can apply for rehearing. For further information on the CPUC's decision-making process, call the CPUC Public Advisor at (415) 703-2074.

If the CPUC approves the project or an alternative, the CPUC will implement a Mitigation Monitoring, Reporting, and Compliance Program as defined in Section 9 of this EIR/EIS. This program will ensure that the approved route is constructed as defined, and that all adopted mitigation measures and Applicant-Proposed Measures are implemented in order that effects on the environment do not exceed those defined in this EIR/EIS.

G. BLM Actions after Final EIR/EIS is Made Public

BLM will not issue a decision on the EITP ROW application until at least 30 days from the date of publication of the Notice of Availability of the Final EIS in the Federal Register. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW authorization to SCE for the proposed EITP.

H. Availability of Final EIR/EIS

Copies of the Final EIR/EIS have also been mailed to parties to the General Proceeding and Federal, State, and local government agencies that commented on the Draft EIR/EIS, as well as some members of the public. The document is available on the CPUC's project website at: http://www.cpuc.ca.gov/Environment/info/ene/ivanpah/ivanpah.html and at the repository sites listed below. EIR-related documents, including the Scoping Report, the Draft EIR/EIS, and this Final EIR/EIS are available at these public locations:

List of Repositories for EITP Documents

Agency	Address	Phone Number
DOI, Bureau of Land Management		
BLM Needles Field Office	1303 South Highway 95 Needles, CA 92363-4428	(760) 326-7000
County and City Public Libraries		
Las Vegas Library	833 Las Vegas Blvd. North Las Vegas, NV 89101	(702) 507-3500
Searchlight Library	200 Michael Wendell Way Searchlight, NV 89046	(702) 297-1442
Barstow Library	304 Buena Vista St. Barstow, CA 92311	(760) 256-4850

Copies of the Final EIR/EIS on CD may be requested by phone at (415) 981-2811, by email at Ivanpah@ene.com, or by fax at (415) 981-0801. The CPUC also has a limited number of copies of the complete Final EIR/EIS document available to the public upon request at:

Eldorado–Ivanpah Transmission Project
130 Battery Street, 4th Floor
San Francisco, CA 94111

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Needles Field Office
1303 South U.S. Highway 95
Needles, CA 92363
www.ca.blm.gov/needles

November 1, 2010

In Reply Refer To:
2800/CACA49834

Dear Reader/Interested Party:

I am pleased to announce the availability of the Eldorado to Ivanpah Transmission Project (EITP) Final Environmental Impact Report/Final Environmental Impact Statement (Final EIR/EIS), which considers permitting of a right of way (ROW) to Southern California Edison (SCE) for a 230-kilovolt (kV) electric transmission line. This joint Final EIR/EIS has been prepared on behalf of the California Public Utilities Commission (CPUC) and Bureau of Land Management (BLM) to meet their respective obligations that cover electric transmission lines constructed on public lands in the State of California and the State of Nevada.

The EITP would upgrade approximately 35 miles of existing single-circuit 115-kV subtransmission line to double-circuit 230-kV transmission line between the Ivanpah Dry Lake area and the existing Eldorado Substation, construct a new substation (Ivanpah Substation), install upgrades within the existing Eldorado Substation, and install a redundant telecommunications path between the Ivanpah and Eldorado substations. The redundant telecommunications path would be strung along the existing 500-kV Eldorado—Lugo transmission line for approximately 25 miles before it would be installed in a new underground duct for approximately 5 miles along the northern edge of Nipton Road to a new microwave tower outside Nipton, California. The EITP would be located in Clark County, Nevada and San Bernardino County, California near Primm, Nevada.

The Final EIR/EIS has been prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) and incorporates changes resulting from comments submitted during the 45-day public comment period for the Draft EIR/EIS that was published April 30, 2010, and concluded on June 26, 2010. There were 15 comment letters received on the Draft EIR/EIS. The Final EIR/EIS consists of two volumes completely reprinted from the Draft EIR/EIS with all appendices available as a separate CD, Volume 3. Changes made to the Draft EIR/EIS are marked in Volumes 1 and 2; inserted text is underlined and deleted text is shown in ~~strikethrough~~.

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After publication of this joint Final EIR/EIS, the CPUC and the BLM will complete separate decisions for the EITP. There is no comment period following issuance of the Final EIR; however, the CPUC will determine the adequacy of this Final EIR, and, if adequate, will certify the document as compliant with CEQA. Public Participation Hearings and Evidentiary Hearings will be held at the CPUC offices in December 2010. The CPUC will issue a Decision on the proposed EITP, which will be announced and published concurrent with a scheduled CPUC Meeting. The final decision is expected in December 2010. Within 30 days after the Decision is issued by the CPUC, parties can apply for rehearing. If the CPUC approves the project or an alternative, the CPUC will implement a Mitigation Monitoring, Reporting, and Compliance Program as defined in Section 9 of this EIR/EIS. This program will ensure that the approved route is constructed as defined, and that all adopted mitigation measures and applicant-proposed measures are implemented in order that effects on the environment do not exceed those defined in this EIR/EIS.

BLM will not issue a decision on the EITP ROW application until at least 30 days from the date of publication of the Notice of Availability of the Final EIS in the Federal Register. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW authorization to SCE for the proposed EITP.

You may submit comments related to the EITP Final EIS to the BLM during the 30-day period mentioned above by any of the following methods:

- Web site: http://www.blm.gov/ca/st/en/fo/needles.html
- Email: caeitp@blm.gov subject line EITP
- Fax: (760) 326-7099
- Mail: George R. Meckfessel, Needles Field Office
  Bureau of Land Management, 1303 South U. S. Highway 95
  Needles, CA 92363-4228

Copies of the Final EIR/EIS have been mailed to parties of the General Proceeding and Federal, State, and local government agencies that commented on the Draft EIR/EIS, as well as some members of the public. The document is available on the CPUC's project website at: http://www.cpuc.ca.gov/Environment/info/ene/ivanpah/ivanpah.html and at the repository sites listed below. EIR-related documents, including the Scoping Report, the Draft EIR/EIS, and this Final EIR/EIS are available at these public locations:

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Eldorado–Ivanpah Transmission Project
130 Battery Street, 4th Floor
San Francisco, CA 94111

Thank you for your continued interest in the management of public lands in California and Nevada. The BLM appreciates your involvement in this FEIS.

Sincerely,

Raymond C. Lee
Field Manager

Environmental Impact Report / Environmental Impact Statement
For the Eldorado to Ivanpah Transmission Project
( ) Draft (X) Final
Lead Agencies: California Public Utilities Commission
and the United States Department of the Interior
Bureau of Land Management

Counties Directly Affected: San Bernardino, California and Clark County, Nevada

Environmental Impact Report Contact:
Monisha Gangopadhyay, CPUC
Phone: 415-703-5595

Environmental Impact Statement Contact:
Tom Hurshman, BLM
Phone: 970-240-5345

Date Final EIR/EIS filed with the U.S. Environmental Protection Agency: November 5, 2010

Abstract
The EITP would upgrade approximately 35 miles of existing single-circuit 115-kV subtransmission line to double-circuit 230-kV transmission line between the Ivanpah Dry Lake area and the existing Eldorado Substation, construct a new substation (Ivanpah Substation), install upgrades within the existing Eldorado Substation, and install a redundant telecommunications path between the Ivanpah and Eldorado substations. The redundant telecommunications path would be strung along the existing 500-kV Eldorado—Lugo transmission line for approximately 25 miles before it would be installed in a new underground duct for approximately 5 miles along the northern edge of Nipton Road to a new microwave tower outside Nipton, California. The EITP would be located in Clark County, Nevada and San Bernardino County, California near Primm, Nevada.

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Bureau of Land Management
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APPENDICES

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Figures

Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AAQS	ambient air quality standards
AB	Assembly Bill
AC	Alternating Current
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ACSR	Aluminum Conductor Steel Reinforced
AEP	Association of Environmental Professionals
ANCA	Airport Noise Compatibility Area
APM	Applicant Proposed Measure
AQCMM	Air Quality Construction Mitigation Manager
ARPA	Archaeological Resources Protection Act
ASTM	American Society for Testing Materials
ATC	Authority to Construct
BCC	Birds of Conservation Concern
BCCE	Boulder City Conservation Easement
BCI	Bat Conservation International
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
BVUSD	Baker Valley Unified School District
C	Celsius
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
cal BP	calibrated years before the present
Cal/EMA	California Emergency Management Agency
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California State Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCCP	Clark County Comprehensive Plan
CC-DAQEM	Clark County Department of Air Quality and Environmental Management
CCDOA	Clark County Department of Aviation
CCR	California Code of Regulations
CCSD	Clark County School District
CDCA	California Desert Conservation Area
CDE	Department of Education, California
CDF	California Department of Finance
CDFG	California Department of Fish and Game
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act

CERTS/EPG	Consortium for Electric Reliability Technology Solutions/Electric Power Group
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	Methane
CIPC	California Invasive Plant Council
CIWMB	California Integrated Waste Management Board
cm	Centimeter
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
COC	Condition of Certification
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
CREZ	California Renewable Energy Zone
CRHR	California Register of Historical Resources
CRS	Cultural Resources Specialist
CSC	California species of special concern
Cumulative dBA	Allowable Increase in Cumulative Noise Level
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dBA	A-weighted decibel
DEHS	Department of Environmental Health and Safety, San Bernardino County
DEIR	Draft Environmental Report
DESCP	Drainage, Erosion, and Sedimentation Control Plan
DHS	Department of Health Services, California
dm	Decimeters
DNL	Daytime-Nighttime Noise Level
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control, California
DWMA	Desert Wildlife Management Area
EAP	Energy Action Plan
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
EITP	Eldorado–Ivanpah Transmission Project
ELF	Extremely low frequency
EMF	electromagnetic field
EO	element occurrence
EPAct	Energy Policy Act
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
F	Fahrenheit
FAA	Federal Aviation Administration
FCR	Field Contact Representative
FEMA	Federal Emergency Management Agency

FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
FRP	Facility Response Plan
FSA/DEIS	Final Staff Assessment / Draft Environmental Impact Statement
FTA	Federal Transit Administration
g	acceleration of gravity
GHG	greenhouse gas
GO	General Order
GWP	global warming potential
H_2S	hydrogen sulfide
HAER	Historic American Engineering Record
HAPs	hazardous air pollutants
HAZMAT	hazardous materials
HCP	Habitat Conservation Plan
HMBP	Hazardous Materials Business Plan
hp	horsepower
HSC	Health and Safety Code
HSWA	Hazardous and Solid Waste Act
HWCL	Hazardous Waste Control Law, California
HWMP	Hazardous Waste Management Plan
Hz	Hertz
I-15	Interstate 15
IARC	International Agency for Research on Cancer
IBC	International Building Code
ICC	International Code Council
IEPR	Integrated Energy Policy Report
IMA	Intensively Managed Area
IMACS	Intermountain Archaeological Computer System
IPCC	Intergovernmental Panel on Climate Change
ISEGS	Ivanpah Solar Electric Generating System
kcmil	kilo circular mils
km	Kilometer
KOP	key observation point
kV	kilovolt
kV/m	kilovolts per meter
kW	kilowatt
LADWP	Los Angeles Department of Water and Power
L_{dn}	Daytime-Nighttime Noise Level
L_{eq}	equivalent sound pressure level
LGIP	Large Generator Interconnection Procedures
LIMA	Less Intensively Managed Area
LORS	Laws, Ordinance, Regulations, and Standards
LOS	Level of Service
LST	lattice steel tower
LVCVA	Las Vegas Convention and Visitors Authority
$\mu g/m^3$	micrograms per cubic meter
m	meter
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District

MEER	mechanical and electrical equipment room
mG	milliGauss
mgd	million gallons per day
MM	mitigation measure
MMP	mitigation and monitoring program
MMT	million metric tons
$MMTCO_2e$	million metric tons of CO_2 equivalents
MNP	Mojave National Preserve
MP	milepost
MRDS	Mineral Resource Data System
MSHCP	Multiple Species Habitat Conservation Plan
MUMA	Multiple Use Managed Area
MVA	megavolt ampere
MW	megawatt
mybp	million years before present
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAHC	Native American Heritage Commission
NAWS	Naval Air Weapons Station
NCCP	Natural Communities Conservation Plan
NCDC	National Climatic Data Center
NCP	National Contingency Plan
NDEP	Nevada Department of Environmental Protection
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEMO	Northern and Eastern Mojave
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFIP	National Flood Insurance Program
NGS	National Geographic Society
NHPA	National Historic Preservation Act
NHPC	National Historic Preservation Council
NIEHS	National Institute of Environmental Health Sciences
NNHP	Nevada Natural Heritage Program
NNPS	Nevada Native Plant Society
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSPS	New Source Performance Standards
OES	Governor's Office of Emergency Services
OHV	off-highway vehicle
OPGW	optical ground wire
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration

PCB	polychlorinated biphenyl
PE	professional engineer
PEA	Proponent's Environmental Assessment
PFYC	Potential Fossil Yield Classification
PG	professional geologist
PM_{10}	particulate matter less than or equal to 10 micrometers in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 micrometers in diameter
PPA	Purchase Power Agreement
ppm	parts per million
PRC	Public Resources Code
PRMMP	Paleontological Resource Management and Monitoring Plan
PRR	Paleontological Resources Report
PRS	Paleontological Resource Specialist
PSD	Prevention of Significant Deterioration
PTO	Permit to Operate
PU	Public Utilities
PUCN	Public Utilities Commission of Nevada
RCRA	Resource Conservation and Recovery Act
RCS	Remote Control Switch
RETI	Renewable Energy Transmission Initiative
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RPS	Renewables Portfolio Standard
RWD	Report of Waste Discharge
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SBCFD	San Bernardino County Fire Department
SBCM	San Bernardino County Museum
SCADA	supervisory control and data acquisition
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SEL	sound exposure level
SF_6	sulfur hexafluoride
SFS	Stateline Fault System
SIP	State Implementation Plan
SNSA	Southern Nevada Supplemental Airport
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Countermeasure, and Control Plan
SPLA&SL	San Pedro, Los Angeles, and Salt Lake Railroad
SPS	Special Protection System
SR	State Route
SRMA	Special Recreation Management Area
Staff	Bureau of Land Management and California Energy Commission Staff
STG	steam turbine-generator
SVP	Society of Vertebrate Paleontology

SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board, California
TAC	toxic air contaminant
TSD	treatment, storage, and disposal
TSP	tubular steel pole
U.S. EPA	U.S. Environmental Protection Agency
UBC	Uniform Building Code
UEPA	Utility Environmental Protection Act
UFT	underground fuel tank
UMA	Unmanaged Area
UPRR	Union Pacific Railroad
URTD	upper respiratory tract disease
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VdB	vibration velocity level in decibels
VOC	volatile organic compound
VRI	Visual Resource Inventory
VRM	Visual Resource Management
VRP	visibility-reducing particle
WBWG	Western Bat Working Group
WEAP	Worker Environmental Awareness Program
WECC	Western Electricity Coordinating Council
WECC PEIS	West-wide Energy Corridor Programmatic Environmental Impact Statement
WHBA	Wild Free-Roaming Horses and Burros Act
WHO	World Health Organization
WQMP	Water Quality Management Plan

Executive Summary

ES.1 Introduction

On May 28, 2009, Southern California Edison (SCE, or the applicant) submitted an application (A.09-05-027) to the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (CPCN) to construct and operate the Eldorado–Ivanpah Transmission Project (EITP, or the project). Because the project would be located primarily on lands managed by the Bureau of Land Management (BLM), the applicant also filed a right-of-way (ROW) application with the BLM for a permit to construct. In compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act of 1969 (NEPA), as amended, the CPUC and the BLM have prepared this Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) to provide to both agency decision-makers and the public detailed information about the environmental impacts of the project, reasonable alternatives to the project, and ways to mitigate or avoid the project's significant or adverse environmental impacts.

The CPUC's purpose for developing the EIR/EIS is to respond to SCE's application for a CPCN under California Public Utilities Code Section 1001, et seq., and General Order 131-D. The purpose of this EIR is to disclose any environmental impacts associated with the project, in compliance with CEQA, to assist CPUC decision makers in determining whether to issue a CPCN for the EITP.

The applicant has filed an application for a ROW across public lands with the BLM pursuant to Title V of the Federal Land Policy and Management Act (FLPMA) to upgrade the existing electric transmission system with a newer and larger transmission line, substations, and communications facilities. Federal orders and laws require government agencies to evaluate energy generation projects and facilitate the development of renewable generation sources. The BLM will evaluate the ROW application in accordance with 43 Code of Federal Regulations (CFR) 2800.

The BLM's purpose in preparing the EIS is to:

- Disclose the potential effects of authorizing the proposed transmission line and examine reasonable alternatives to the proposed action;
- Determine whether the proposed transmission line is consistent with BLM land use plans;
- Decide whether the ROW grant should be issued for the transmission line;
- Determine the most appropriate location for the transmission line on federal lands, considering multiple use objectives; and
- Determine conditions that should be applied to the construction, operation, and maintenance of the transmission line on federal lands.

This Final EIR/EIS describes and evaluates the environmental impacts that are expected to result from construction and operation of the applicant's proposed EITP, and presents recommended mitigation measures that, if adopted, would avoid or minimize many of the significant environmental impacts identified. In accordance with CEQA and NEPA requirements, this EIR/EIS also identifies alternatives to the proposed project (including the No Project / No Action Alternative) that could avoid or minimize significant environmental impacts associated with the project as proposed by the applicant, and evaluates the environmental impacts associated with these alternatives. Specifically, the information contained in this EIR/EIS will be considered by the CPUC and the BLM in their respective deliberations on approval of the CPCN and the ROW grant. The information may also be considered by other agencies responsible for permits related to the project.

The applicant's purpose for the proposed project is to interconnect and deliver up to 1,400 megawatts (MW) of renewable energy that is expected to be developed in the Ivanpah Valley area. SCE's existing facilities at Eldorado Substation and existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line cannot accommodate the additional power that would be generated by the anticipated renewable projects in the Ivanpah Valley. The applicant has proposed to construct the EITP to connect planned renewable energy sources to the CAISO-controlled transmission grid. The CAISO plans and approves transmission interconnections and maintains an Interconnection Request Queue of generation projects that have requested access to the transmission grid. The EITP would also improve line reliability so that it would comply with North American Electric Reliability Corporation (NERC) standards.

The applicant identified the following additional objectives for the project in the Proponent's Environmental Assessment (PEA):

1. Reliably interconnect new renewable generation resources (including but not limited to new solar generation) in the Ivanpah Valley area and help the applicant and other California utilities comply with the California Renewables Portfolio Standard (RPS) in an expedited manner;
2. Comply with all applicable reliability planning criteria required by NERC, the Western Electricity Coordinating Council (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 to minimize effects on previously undisturbed land and resources;
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; and
7. Meet project needs in a cost-effective and timely manner.

In addition to the applicant's stated purpose and objectives for the project, three solar developers have become party to the CPUC proceedings and have formally stated their support for the EITP. These developers have applications to construct solar generation facilities near the proposed project and have stated their intention to connect to the California electrical grid through the EITP. BrightSource Energy, Inc., filed a response in support of the project on October 26, 2009, and reiterated its support for the project at the CPUC's pre-hearing conference on December 2, 2009. First Solar, Inc., appeared as a party at the pre-hearing conference and stated its support for the project; First Solar intends to connect its proposed generation facility to the EITP lines in the area of the proposed project. Similarly, in a Motion for Party Status dated January 11, 2010, NextLight Renewable Power, LLC, stated both its support for and intention to interconnect with the proposed project.

Having taken into consideration the applicant's seven objectives listed above, the CPUC and BLM identified the following abridged objectives:

1. To connect renewable energy sources in the Ivanpah Valley area in compliance with Executive Order 13212, the Energy Policy Act of 2005, the Federal Power Act, California Senate Bill 1078, and California Senate Bill 107;
2. To improve reliability in compliance with applicable standards, including NERC, WECC, CAISO, and SCE standards; and
3. To maximize the use of existing ROW and designated utility corridors to minimize impacts on environmental resources.

ES.2 Changes Between Issuance of the April 2010 Draft EIR/EIS and the November 2010 Final EIR/EIS

The Draft EIR/EIS was published on April 30, 2010. The public review period on the Draft EIR/EIS concluded on June 26, 2010, meeting the requirements of both CEQA and NEPA. The comments received on the DEIR/EIS are presented in Appendix G of this Final EIR/EIS, along with responses to each comment. Some comments received on the Draft EIR/EIS also resulted in changes to the text of the EIR/EIS. These changes are indicated in this Final EIR/EIS except in this Executive Summary. Inserted text is underlined and deleted text is shown in ~~strikeout.~~

The following list provides the changes made to the Final EIR/EIS project description in response to comments received on the Draft EIR/EIS. None of these changes led to an increase in the significance or severity of a CEQA or NEPA impact determination.

- **ISEGS Whole of the Action Description:** The ISEGS project description is now updated based on the recent CEC Final Decision and BLM FEIS and ROD. The ISEGS Mitigated Ivanpah 3 Alternative is now discussed in this document since this alternative replaced the original proposed project in the ISEGS CEQA and NEPA environmental review documents.
- **Clarifications on Grid Interconnection:** The ISEGS/EITP interconnection is now further described in response to comments and new information provided by the applicant.
- **Land Disturbance Values:** Corrections have been made to the land disturbance values presented for spur/access roads, helicopter staging areas and construction yards, undergrounding, and temporary disturbance from the 33-kV distribution line.
- **Microwave Site Listed in Project Description Summary:** The microwave communication site is now described as a telecommunication component in the project description summary. The microwave site was previously described and analyzed in the Draft EIR/EIS but had been left out of the summary.
- **Potential EITP Users Clarified:** Text is now included that clarifies that EITP may connect other sources of energy to the grid in the future and not just solar generation.
- **115-kV Subtransmission Line Clarification**: Text is now included that clarifies that a piece of the existing 115-kV transmission line from Mountain Pass will remain and will terminate at the Ivanpah Substation.
- **Underground Fiber-optic Cable Segment Lengths**: Adjustments have been made to the lengths (~2 miles in Nevada and 3 miles in California) reported for the fiber-optic cable segments.
- **Underground Alert Service**: Updated Underground Alert Service information is now provided for Nevada.
- **33-kV Distribution Circuitry Adjustments**:
  - The applicant revised the description of voltages of the EITP distribution lines (from 12-kV to 33-kV), and this information is now included in this document.
  - The lengths of new ducts and circuitry required are now updated (400 feet of new ducts, 1-mile segment of circuitry).
  - Underground/overhead line lengths are now updated: 5,200 feet underground and 5,900 feet overhead.
- **Access and Spur Roads Lengths Adjusted**: The applicant revised the description of the access roads and spur roads. The updated values are now incorporated: 1.7 miles of new spur roads (originally 1.2 miles) and 1.2 miles of new access roads.
- **Transformer banks at the Ivanpah Substation to reflect current CAISO recommendations**: The proposed Ivanpah Substation now includes two 280-MVA 230/115-kV transformer banks (originally three) and three 230-kV lines in the switchrack (originally five).

- **Transformer Installation:** The applicant now intends to install the transformers by truck (towing) instead of using cranes.
- **Helicopter staging areas**: The applicant revised the description of HS-1. The size of HS-1 has been adjusted from 3.6 to 5.0 acres.
- **Water usage:**
  - The applicant provided new information on water usage and water source:
    - Construction: water will be sourced from wells owned by Molycorp, Minerals, LLC.
    - Operations: no water will be used for routine line washing.
- **Erosion control**: An updated erosion-control description has been added.
- **SF_6 recovery procedures**: Additional information on SF_6 recovery procedures provided by the applicant has been added to the document.
- **Type of fuel to be used in emergency generator:** Additional information on fuels provided by the applicant has been added to the document.
- **Fuel truck use and spill containment procedures**: Additional information on fuel truck use provided by the applicant has been added to the document.
- **Area Transmission Lines:** Corrections to maps and references to transmission lines crossed by the proposed EITP route have been made.
- **Non-transmission Alternatives:** Expanded discussion of the in-basin generation and demand-side alternatives were included in response to public comments to the DEIR/EIS.

In two cases, new information provided by the applicant on the project after the publication of the DEIR/EIS led to a reduction in the significance or severity of an impact under CEQA and/or NEPA. Impact HYDRO-2 (Lowering of Water Table or Interference with Aquifer Recharge) and IMPACT PUSVC-2 (Project Construction Temporarily Increases Water Use, and Project Operation Contributes to Increased Long-Term Water Consumption) have been reduced to less than significant. These impacts were determined to be potentially significant in the Draft EIR/EIS; however, when the draft was published, the source of the water to be used for dust suppression during construction was unknown. The water supply in the project area is limited, and therefore, there was a possibility that the impact on groundwater supplies could be significant. After the Draft EIR/EIS was published, the applicant submitted information on water supply that included a designated source: wells owned by Molycorp Minerals, LLC. This information was incorporated into the hydrology and water quality analysis and the public services and utilities analysis. The updated CEQA determination is less than significant with mitigation for both of these impacts. The potential for lowering local groundwater levels during project construction would be negligible, localized, and short term.

ES.3 Overview of the Proposed Project and Alternatives

The proposed EITP would include the following components:

- **Powerlines**
  - **Eldorado–Ivanpah Transmission Line –** A new double-circuit 230-kilovolt (kV) transmission line, approximately 35 miles long, would be constructed between the existing Eldorado Substation in Nevada and the proposed Ivanpah Substation in California. It would replace a portion of the existing 115-kV transmission line that runs from Eldorado to Mountain Pass through Baker, Dunn Siding, and Coolwater Substations.

- **Subtransmission Line –** A proposed 600- to 800-foot-long 115-kV subtransmission line would connect the remaining portion of the existing Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass line to the proposed Ivanpah Substation.
- **Distribution Lines –** A proposed 33-kV distribution circuit, consisting of approximately 5,200 feet of new underground facilities and 5,900 feet of overhead lines, would be constructed to provide light and power to the proposed Ivanpah Substation and microwave telecommunications site in Nipton, California. Approximately 400 feet of new underground circuitry would be constructed to provide light and auxiliary power to the proposed Ivanpah Substation. In addition, the new distribution circuit includes a new 4,300-foot segment of 33-kV overhead lines and a new underground service would provide power to a proposed microwave telecommunications site.

- **Substations**
  - **Ivanpah Substation –** The proposed substation would be located in California near Primm, Nevada, and would serve as a connector hub for renewable energy generated in the Ivanpah Valley area. The substation would include a mechanical and electrical equipment room (MEER) and microwave tower.
  - **Eldorado Substation –** Changes would be made inside the existing Eldorado Substation to accommodate the new Eldorado–Ivanpah 230-kV transmission line.
- **Telecommunication System**
  - Existing overhead ground wire would be replaced with optical ground wire on an approximately 25-mile section of the existing Eldorado–Lugo 500-kV transmission line.
  - A 4.8-mile-long underground duct from the Eldorado–Lugo 500-kV transmission line to a proposed communication site in Nipton, California, would be installed.
  - A microwave communication site in Nipton that would consist of a communication building, a microwave tower, and an emergency generator.
  - A microwave path consisting of two 180-foot-tall communication towers would be installed between Nipton and the proposed Ivanpah Substation (a length of approximately 12 miles).
  - A communications room would be installed in the MEER at the new Ivanpah Substation to house communication equipment.
  - Telecommunication equipment would be installed at the Eldorado Substation.

Alternatives to the proposed project were developed in accordance with CEQA and NEPA requirements and are the outcome of a CPUC and BLM screening process that identified and analyzed a full range of reasonable alternatives. Before filing the application, the applicant consulted with both the CPUC and the BLM through a pre-filing process, and a number of alternatives were developed at that time. Additionally, the CPUC and the BLM performed an independent and thorough review of all the information submitted with the application to develop a range of reasonable alternatives that would reduce one or more adverse effects. This process included a review of surveys, studies, and applicable planning documents for the region and a meeting with the CAISO on September 28, 2009, to discuss reliability standards and transmission system planning. In addition, the alternatives analysis was expanded considering two non-transmission scenarios: in-basin generation and demand-side. These alternatives were not carried forward for analysis in this EIR/EIS and are further explained in Appendix A-1, Alternatives Screening Report.

Alternatives to the proposed project carried forward for further analysis in this EIR/EIS are different transmission line routes and telecommunications options. Alternatives carried forward are considered at an equivalent level of analysis as the proposed project in this EIR/EIS. The alternatives carried forward for analysis in this EIR/EIS are:

- **Parallel to Los Angeles Department of Water and Power (LADWP) Corridor Alternative (Transmission Alternative Route A):** This alternative would deviate from the existing ROW from milepost (MP) 1 to MP 7, paralleling an existing LADWP transmission line to bypass a 0.8-mile segment of the proposed route that would not be located within the existing BLM designated utility corridor.

- **North of Eldorado Alternative (Transmission Alternative Route B):** This alternative would deviate from the existing ROW from MP 1 to MP 2, paralleling an existing Eldorado–Mead 230-kV transmission line to bypass a 0.8-mile segment of the proposed route that would not be located within an existing BLM-designated utility corridor.
- **North Dry Lakes Reroute Alternative (Transmission Alternative Route C):** This alternative would deviate from the existing ROW from MP 27 to MP 35 to avoid crossing Ivanpah Dry Lake.
- **South Dry Lakes Reroute Alternative (Transmission Alternative Route D):** This alternative would deviate from the existing ROW from MP 27 to MP 30 and would parallel the existing LADWP Marketplace–Adelanto 500-kV transmission line where that line crosses through the Ivanpah Dry Lake. This route would reduce the overall transmission footprint, since the EITP towers would follow to the extent feasible the existing LADWP 500-kV ROW.
- **South Dry Lakes Bypass Alternative (Transmission Subalternative E):** This alternative is a sub-alternative of Transmission Alternative Route D and would replace the northernmost portion of Alternative D. This route would also reduce the overall transmission footprint, since the EITP towers would follow to the extent feasible the existing LADWP 500-kV ROW.
- **Telecommunication Alternative (Golf Course):** This alternative would deviate from the proposed telecommunication route outside the Town of Nipton, California. This alternative would not require the proposed microwave tower. The telecommunications line would continue along the north side of Nipton Road in a new underground duct for approximately 10 miles. The telecommunications line would then be underbuilt on existing distribution lines for approximately 10 miles to the proposed Ivanpah section, with the exception of a segment that would be installed in a new underground duct beneath the Primm Valley Golf Course.
- **Telecommunication Alternative (Mountain Pass):** This alternative would deviate from the proposed telecommunication route outside the town of Nipton, California. This alternative would not require the proposed microwave tower. The telecommunications line would continue along the north side of Nipton Road in a new underground duct for approximately 10 miles. West of the town of Mountain Pass, the telecommunications line would be underbuilt on existing distribution lines for approximately 15 miles and then would run north of the existing Mountain Pass Substation to the proposed Ivanpah Substation.

Additional alternatives were considered but eliminated from further consideration, based on a preliminary analysis of potential environmental impacts, feasibility, and ability to meet the basic project objectives outlined in Section ES.1. These alternatives and the rationale for their elimination are discussed in detail in Appendix A-1, Alternative Screening Report.

ES.4 Choice Among Alternatives

This summary describes the proposed project and alternatives. A more detailed description is provided in Chapter 2, “Description of the Proposed Project and Alternatives.” To determine the alternatives that would be analyzed in detail in this Draft EIR/EIS, a screening process was completed. The results of this process are documented in the Alternatives Screening Report provided in Appendix A-1. The alternatives screening process evaluated 18 potential alternatives, classified in four major categories: system, routing, telecommunication, and technology. The alternatives screening process consisted of the following steps:

- **Step 1 –** Describe each alternative to facilitate comparative evaluation.

- **Step 2 –** Evaluate the advantages and disadvantages of each alternative compared with the proposed project, based on CEQA/NEPA criteria such as project objectives, purpose, and need; feasibility; and environmental effects.
- **Step 3 –** Retain for analysis only the alternatives that meet the CEQA/NEPA criteria.

As a result of this screening process, seven alternatives were carried forward to be analyzed in this Draft EIR/EIS along with the No Project / No Action Alternative and the proposed project. The advantages and disadvantages of these alternatives are summarized in Table ES-1.

Ranking of Alternatives and Selection of the Environmentally Superior Alternative (CEQA) and Agency Preferred Alternative (NEPA)

The environmental analysis presented in this EIR/EIS evaluates the potential impacts associated with the reasonable range of alternatives carried forward for analysis of the EITP. The alternatives were ranked from the most to the least environmentally preferred to facilitate selection of the Environmentally Superior Alternative under CEQA (California Code of Regulations [CCR], Title 14 §15126.6(e)(2)). Similarly, the results of the comparison of alternatives lead to the BLM Preferred Alternative under NEPA.

The various transmission alternative routes could have major differences in potential impacts on biological resources. Increases in the total temporary and permanent disturbance of previously undisturbed desert habitat would result in the direct and indirect loss of habitat for listed or sensitive plant species, native vegetation communities, and sensitive wildlife habitat. Alternatives B and C would have the greatest associated disturbance and effects on these resources. The increase in the spatial extent of the project footprint would increase the potential for disturbing wildlife and inducing wildlife mortality. In particular, Alternative C would cross higher quality desert tortoise habitat. Alternative D and Subalternative E would also have associated impacts on native vegetation (pink funnel lily) not found along the proposed project route.

Comparison of alternatives has resulted in the following ranking of environmentally preferred alternatives:

- Proposed Project
- Transmission Alternative Routes A and D, with Subalternative E
- Transmission Alternative Route B
- Transmission Alternative Route C
- Golf Course Telecommunication Alternative
- Mountain Pass Telecommunication Alternative

Each transmission or telecommunication alternative was analyzed separately; however because the transmission alternatives are minor route variations, Transmission Alternative Routes A or B could be combined with either Transmission Alternative Routes C or D or Subalternative E. Similarly, any of the routing alternatives could be combined with either telecommunication alternative.

Based on the conclusions of the environmental analysis, the CPUC has determined that the environmentally superior alternative is the proposed project, because it would have less land disturbance and its impacts on sensitive biological resources would be less significant, and because it would meet all of the project's objectives. However, under CEQA the proposed project would result in significant and unavoidable impacts to desert tortoise habitat (biological resources) and significant adverse impacts to air quality. Taken together, the ISEGS and EITP project would result in significant and unavoidable impacts on several sensitive plant species and desert tortoise (biological resources), air quality, and visual resources. The two projects also contribute to significant and unavoidable cumulative impacts on land use.

Table ES-1 Summary Comparison of Components of the Proposed Project and Alternatives

Category	Alternatives	Preliminary Environmental Comparison with the Proposed Project	
		Advantages	**Disadvantages**
Transmission Alternative Routes	Parallel to LADWP (Transmission Alternative A)	• Would eliminate several transmission crossovers near Eldorado Substation • Route would fall within an existing BLM-designated utility corridor • Reduced impacts to cultural resources • Reduced impacts to intermittent streams	• Potential for greater habitat disturbance. The construction area west of Eldorado Substation consists of undisturbed desert habitat • Potential for greater impact to tortoise habitat, other wildlife, rare plant species, and desert vegetation
	North of Eldorado (Transmission Alternative B)	• Reduced impacts to cultural resources • Reduced impacts to intermittent streams due to fewer crossings • Route would fall within an existing BLM-designated utility corridor	• Would require 5.3 miles of new transmission line ROW • Greater potential for ground disturbance from new transmission line ROW
	North Dry Lakes Reroute (Transmission Alternative C)	• Avoids crossing Ivanpah Dry Lake • Reduced visual impact compared with the proposed project; existing transmission line would be removed and relocated and it would not be visible from nearby residential use • Reduced impacts to paleontological resources • Reduced impacts to intermittent streams due to fewer crossings	• Potential for greater impacts to desert tortoise and its habitat. This alternative has a higher quality desert tortoise habitat compared with the proposed route. • Potential for greater impacts to cultural resources associated with disturbance of Arrowhead Trail Highway • Would require 5.3 miles of new 130-foot ROW north of Ivanpah Dry Lake and Primm, Nevada
	South Dry Lakes Reroute (Transmission Alternative D)	• Would reduce the overall transmission footprint, following to the extent feasible the existing LADWP 500-kV ROW • Reduced visual impact compared with the proposed project; existing transmission line would be removed and relocated and it would not be visible from nearby residential use • Reduced potential for the presence of sensitive wildlife or plant species occurring within the limits of this alternative (except native pink funnel lily) • Reduced impacts to intermittent streams due to fewer crossings	• Potential for greater impacts to cultural resources • Potential for greater ground disturbance due to new access roads • Would require approximately 3.3 miles of new ROW
	South Dry Lakes Bypass (Transmission Subalternative E)	• Similar to those identified for Alternative D	• Similar to those identified for Alternative D

Table ES-1 Summary Comparison of Components of the Proposed Project and Alternatives

Category	Alternatives	Preliminary Environmental Comparison with the Proposed Project	
		Advantages	Disadvantages
Telecommunication Alternatives	Golf Course Telecommunication Alternative	• Visual impacts may be reduced for certain portions of the telecommunication line that would be located underground	• Potential for greater ground disturbance and impacts to paleontological resources due to underground construction • Underground construction has potential for greater impacts to sensitive habitat and to cultural and paleontological resources
	Mountain Pass Telecommunication Alternative	• Visual impacts may be reduced for certain portions of the telecommunication line that would be located underground or out of line-of-sight of sensitive resources	• Greater potential for ground disturbance and impacts to paleontological resources due to underground construction • Potential for greater construction-related hazards due to transport, use, or disposal of hazardous materials and for upsets or accidents involving releases of hazardous materials

Note: Information provided here is based on the applicant's preliminary design for the EITP and is subject to change during final engineering.

Key:
kV = kilovolt
LADWP = Los Angeles Department of Water and Power
ROW = right-of-way

Likewise, based on the results of the environmental review and comparison of the major environmental issues associated with each alternative evaluated, the BLM has determined that the agency preferred alternative under NEPA is the proposed action (proposed project). The "agency preferred alternative" is the alternative that the agency believes would fulfill its statutory mission and responsibilities, considering economic, environmental, technical, and other factors (Title 40 CFR Section 1502.14(e)). From the reasonable range of alternatives carried forward for analysis, the proposed project would have an overall lower land disturbance and fewer potential adverse effects on biological resources. However, under NEPA the proposed project would result in major unavoidable adverse effects on desert tortoise habitat and moderate to major adverse effects on aesthetics and air quality.

ES.5 Whole of the Action (CEQA) /Cumulative Action (NEPA)

In addition to the environmental impacts analysis of the proposed project and its alternatives, this document contains information on the proposed Ivanpah Solar Electric Generating System (ISEGS) project.

Because ISEGS would be a stationary generation facility located in California, the CEC is the state agency responsible for issuing a permit to BrightSource, Inc., for the proposed ISEGS project. Because the project would be located on federal lands, ISEGS required a ROW grant from the BLM. The CEC and the BLM are the joint state and federal lead agencies responsible for conducting the environmental analysis for ISEGS. The ISEGS project has been approved by both the CEC and the BLM on October 5, 2010, and October 14, 2010, respectively. The information about ISEGS contained in this document is based on the environmental review contained in the BLM and the CEC's FSA/DEIS; the CEC's FSA Addendum, Errata to the FSA Addendum, and the Final Decision; and the BLM's Supplemental DEIS, Final EIS, and Record of Decision (ROD).

BrightSource, Inc., has an executed Purchase Power Agreement (PPA) with the applicant to connect its ISEGS project to the EITP. Based on the existence of a signed PPA and the quantity and quality of information available on the ISEGS project, the CPUC and the BLM determined that the ISEGS project would be discussed in this document as part of the "Whole of the Action/ Cumulative Action" to comply with CEQA and NEPA disclosure requirements. This document contains information on the design and environmental effects of the ISEGS Mitigated Ivanpah 3 alternative because this was the alternative approved by both the CEC and the BLM. This alternative has a smaller footprint than the original alternative included as part of the "Whole of the Action / Cumulative Action" in the EITP Draft EIR/EIS and was developed to mitigate impacts to special status plant species and desert tortoise habitat.

This EIR/EIS, therefore, analyzes the EITP (including the transmission upgrade, the substation, and the telecommunication system and alternatives) but includes a summary of the ISEGS project's design and environmental impacts, as disclosed in the CEC and BLM's CEQA and NEPA documents listed above. Within Chapter 2, "Project Description," and within each resource section in Chapter 3, "Environmental Analysis / Environmental Effects," the summary of ISEGS' environmental impacts is intended for both disclosure and to assist agency decision-makers. The Whole of the Action / Cumulative Action sections do not include a new analysis of impacts but rather a synopsis of the CEC's and the BLM's determinations. Additionally, an expanded summary of the aggregate impacts of the EITP and the ISEGS project is included in the Final EIR/EIS, to provide enhanced clarity for the public and decision makers.

A brief description of the ISEGS project from the FSA/DEIS follows.

> **ISEGS.** The ISEGS Project proposed by BrightSource Energy, Inc., would be a solar-concentrating thermal power plant and related facilities. The project, located 4.5 miles southwest of Primm, Nevada, would be developed in three separate phases (120 MW, 125 MW, and 125 MW) for a final generation capacity of 370 MW. The ISEGS total project footprint is estimated to be approximately 3,600 acres (or 5.6 square miles).
>
> The proposed development would include fields of sun-tracking heliostat mirrors (173,500 mirrors in total) that would reflect solar heat into boilers on centralized 459-foot-tall power towers (three towers in total for the entire project). Steam from the boilers would power steam turbine generators to produce the electricity. The facility would also include a natural gas backup to provide additional heat for plant start-up and during temporary cloud

cover. The natural gas would be supplied through a 6-mile-long pipeline measuring between 4 to 6 inches in diameter that would supply gas from the Kern River Gas Transmission pipeline.

ES.6 Areas of Controversy, Issues Raised, and Issues to be Resolved

The CPUC and the BLM determined that the proposed EITP could cause a significant adverse effect on the environment. The agencies therefore initiated preparation of an EIR/EIS. The CPUC filed a Notice of Preparation (NOP) with the State Clearinghouse and the BLM published a Notice of Intent (NOI) in the Federal Register. These notices formally initiated a public scoping period during which public and agency input was solicited on the scope of issues that should be addressed in the EIR/EIS. Comments received during the scoping period are included in the Scoping Summary Report (Appendix E).

Sensitive environmental issue / resource areas identified during the scoping process are listed in Table ES-2 and are discussed in detail in Chapter 3 of the EIR/EIS.

Table ES-2 Sensitive Environmental Resource / Issue Areas Identified during the Scoping Process

Issue / Resource Area	Topics Addressed in the Analysis
Alternatives	• Impacts to biological resources, including wildlife • CEQA and NEPA compliance
Biological Resources	• Impacts on migratory birds • Impacts on vegetation • Impacts on wildlife • Mojave National Preserve impacts • Clark County Multiple Species Habitat Conservation Plan (MSHCP)
Cultural Resources	• National Historic Preservation Act compliance
Cumulative Impacts	• Conflicts with applicable federal, state, or local land use plans, goals, or policies • Conflicts with proposed land use • Impacts to biological resources, including wildlife • Lighting interference
Lands and Real Estate	• Clark County Multiple Species Habitat Conservation Plan (MSHCP) • Boulder City Conservation Easement (BCCE)
Purpose and Need	• NEPA compliance
Regulatory Guidelines and Consistency	• NEPA compliance
Safety	• Southern Nevada Supplemental Airport (SNSA)

After publishing the Draft EIR/EIS on April 30, 2010, the CPUC and BLM hosted a 45-day public comment period which concluded on June 26, 2010, meeting both the requirements of CEQA and NEPA. Comments received on the Draft EIR/EIS ranged from requests for clarification on the applicant's project description to requests for additional resource-specific information for several resource sections (e.g., air quality, biology, hazards and safety, and land use), comments on the Whole of the Action / Cumulative Action approach, and comments on the range of project alternatives. A table of those who submitted comments on the Draft EIR/EIS is provided in Table ES-3. The comments letters and corresponding responses to the comments are available in Appendix G of Volume III of the Final EIR/EIS.

Table ES-3 Comments on the DEIR/EIS

Comments received from governmental entities
• US Environmental Protection Agency; • California Department of Fish and Game; • California Department of Transportation; • California Department of Toxic Substances Control; • California State Lands Commission; • Clark County Department of Aviation; • Mojave Dessert Air Quality Management District: and • Nevada Department of Wildlife.
Comments received from interested parties
• BrightSource Energy; • Center for Biological Diversity, San Francisco Office; • Desert Conservation Program; • Powers Engineering; • Sierra Club; • Southern California Edison; and • Western Watersheds Project.

ES.7 Applicant Proposed Measures

The applicant has included the following applicant proposed measures (APMs) to avoid or minimize impacts of the proposed EITP or its alternatives on environmental resources. These APMs are part of the EITP and are distinguished from mitigation measures for potentially significant impacts under CEQA and NEPA. If the proposed EITP (or any of its alternatives) is approved, the applicant will implement the APMs listed in Table ES-4 regardless of whether potential significant impacts were identified during the environmental analysis under this EIR/EIS.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
Aesthetics	
APM 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, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.
APM 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 would blend back into the overall landscape context.
APM AES-3: Non-Reflective Finish	LSTs and TSPs would be constructed of steel that was galvanized and treated at the factory to create a dulled finish that would 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.
APM 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 them to an appearance that would blend back into the overall landscape context.
APM AES-5: Use Existing Access Roads	To the extent feasible, existing access roads would be used.
APM AES-6: Minimize Road Modifications**.**	Widening and grading of roads would be kept to the minimum required for access by proposed project construction equipment.
APM 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.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM 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 offsite light spill at times when the lighting might be in use.
Air Quality	
	The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulation.
Biological Resources	
APM BIO-1: Preconstruction Surveys	Preconstruction biological clearance surveys would be conducted by qualified biologists to identify special-status plants and wildlife.
APM BIO-2: Minimize Vegetation Impacts	Every effort would be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation would be flagged for avoidance.
APM BIO-3: Avoid Impacts on State and Federal Jurisdiction Wetlands	Construction crews would avoid impacting the streambeds and banks of streams along the route to the extent possible. If necessary, an SAA would be secured from the CDFG. Impacts would be mitigated based on the terms of the SAA. No streams with flowing waters capable of supporting special-status species would be expected to be impacted by the proposed project.
APM BIO-4: Best Management Practices	Crews would be directed to use Best Management Practices (BMPs) where applicable. These measures would be identified prior to construction and incorporated into the construction operations.
APM BIO-5: Biological Monitors	Biological monitors would be assigned to the project in areas of sensitive biological resources. The monitors would be responsible for ensuring that impacts on special-status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities would need to be restricted in order to protect native plants and wildlife or special-status species. Those restricted areas would be monitored to ensure their protection during construction.
APM BIO-6: Worker Environmental Awareness Program	A Worker Environmental Awareness Program (WEAP) would be prepared. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would 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 would be maintained.
APM BIO-7: Avoid Impacts on Active Nests	SCE would 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 needed to be removed during the nesting season, or if work was scheduled to take place in close proximity to an active nest on an existing transmission or subtransmission tower or pole, SCE would coordinate with the USFWS, CDFG, and/or the NDOW as appropriate to obtain written verification prior to moving the nest.
APM BIO-8: Avian Protection	All transmission and subtransmission towers and poles would 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 (APLIC 2006).
APM BIO-9: Facility Siting	Final tower and spur road locations would be adjusted to avoid sensitive biological resources to the greatest extent feasible.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-10: Invasive Plant Management	An invasive plant management plan would be developed to reduce the potential for spreading invasive plant species during construction activities.
APM BIO-11: Desert Tortoise Measures	• A field contact representative would be designated and would oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The field contact representative would 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 would be conspicuously staked, flagged, or marked to minimize surface disturbance activities. All workers would strictly limit activities and vehicles to the designated work areas. • Crushing/removal of perennial vegetation in work areas would be avoided to the maximum extent practicable. • All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens. • Pets would not be allowed in working areas unless restrained in a kennel. • Where possible, motor vehicles would be limited to maintained roads and designated routes. • Vehicle speed within the project area, along ROW maintenance routes, and along existing access roads would not exceed 20 miles per hour. Speed limits would be clearly marked and all workers would be made aware of these limits. • Constructed road berms would be less than 12 inches in height and have slopes of less than 30 degrees. • Construction monitoring would 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) would be present during all activities in which encounters with tortoises could 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 USFWS 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). • Preconstruction clearance surveys would be conducted within 48 hours of initiation of site-specific project activities, following USFWS protocol (USFWS 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 would cover 100% of the acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity would be marked. Tortoise burrows would be avoided to the extent practicable, but would be excavated if they would be crushed by construction activities.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-11: Desert Tortoise Measures (Cont.)	• Any tortoise found on the surface would be relocated to less than 1,000 feet away. Tortoises would be handled carefully following the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises would be handled with new latex gloves each time to avoid transmission of disease, and handlers would especially note guidelines for precautions to be taken during high-temperature periods. • If a potential tortoise burrow were required to be excavated, the biologist would proceed according to the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises removed from burrows would be relocated to an artificial burrow (Desert Tortoise Council 1999). The entrance of the artificial burrow would be blocked until construction activities in the area were 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 might occur would be monitored by a qualified or authorized biologist. The biologist would be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The qualified or authorized biologist would 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 was minimized. • No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) would be left unfenced or uncovered; such hazards would be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term project areas would be enclosed with tortoise-proof fencing. Fencing would be removed when restoration of the site was completed. • Any incident occurring during project activities which was considered by the biological monitor to be in non-compliance with the mitigation plan would be documented immediately by the biological monitor. The field contact representative would ensure that appropriate corrective action was taken. Corrective actions would be documented by the monitor. The following incidents would 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 was required. If the monitor and field contact representative did not agree, the federal agency's compliance officer would be contacted for resolution. All parties could refer the resolution to the federal agency's authorized officer. • All construction personnel, including subcontractors, would undergo a WEAP. This instruction would 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.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-11: Desert Tortoise Measures (Cont.)	• Parked vehicles would be inspected prior to being moved. If a tortoise were found beneath a vehicle, the authorized biologist would be contacted to move the animal from harm's way, or the vehicle would not be moved until the desert tortoise left of its own accord. The authorized biologist would be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner was not exposed to temperature extremes that could be harmful to the animal. • Should any desert tortoise be injured or killed, all activities would be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist would be responsible for reporting the incident to the authorizing agencies. • A report to the USFWS would be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises would be reported. • The applicant would implement a Raven Management Program that would consist of: (1) an annual survey to identify any tortoise remains at the base of the towers; this information would be relayed to the BLM so that the ravens and/or their nests in these towers could be targeted for removal, (2) SCE making 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.
APM BIO-12: Desert Bighorn Sheep Measures	The applicant would consult with the BLM, USFWS, and NDOW regarding conservation measures to avoid impacts on desert bighorn sheep during construction. Project areas with the potential to impact bighorn sheep include the proposed transmission line route through the McCullough Mountains and the telecommunication route segment in the southern Eldorado Valley between the Highland Range and the Southern McCullough Mountains. Avoidance and minimization measures could include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn sheep active seasons. Construction requiring the use of helicopters would 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).
APM BIO-13: Western Burrowing Owl Measures	Where project ground-disturbing activities would 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, would be thoroughly inspected by a qualified biologist before collapsing. This would discourage owls from breeding on the construction site. Other species using burrows would be relocated prior to collapsing burrows. If construction were to be initiated after the commencement of the breeding season and burrowing owls could be seen within areas to be affected by ground construction activities, behavioral observations would be done by a qualified biologist to determine their breeding status. If breeding were observed, the nest area would be avoided, with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the chicks fledged.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-14: Gila Monster and Chuckwalla Measures	The following measures are the current 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, and applicable for the chuckwalla in the Nevada section 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 them from other lizards such as chuckwallas and banded geckos; (2) report any observations of Gila monsters (in Nevada) to the 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 harm's way on the construction site would 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) would also be provided to NDOW. • Injuries to Gila monsters may occur during excavation, 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 would not be covered by NDOW. However, NDOW would be immediately notified during normal business hours. If an animal is killed or found dead, the carcass would 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) would 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) would be provided to NDOW. Pictures would 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).

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
Cultural Resources	
APM CR-1: Conduct Archaeological Inventory of Areas that May Be Disturbed	Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the proposed project. A complete cultural resources 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, the applicant would ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys would be conducted and documented according to applicable laws, regulations, and professional standards.
APM CR-2: Avoid and Minimize Impacts on Significant Cultural Resources Wherever Feasible	Avoid and minimize impacts on significant or potentially significant cultural resources wherever feasible. To the extent practical, the applicant would avoid or minimize impacts on archaeological resources, regardless of its CRHR or NRHP eligibility status. This includes siting all ground-disturbing activities and other project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the right-of-way.
APM CR-2a. Avoid Direct Impacts on Significant Cultural Resources through Project Final Design	Project Final Design would avoid direct impacts on significant or potentially significant cultural resources. To the extent practical, all ground-disturbing activities and other project components would be sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.
APM CR-2b. Conduct a Preconstruction Worker Environmental Awareness Program (see BIO-6, PALEO-3, and W-11)	The program would be presented to 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 would be involved in ground-disturbing activities without having participated in the Worker Environmental Awareness Program.
APM CR-2c. Protective Buffer Zones	Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the right-of-way. A protective buffer zone would be established around each recorded archaeological site and treated as an “environmentally sensitive area” within which construction activities and personnel are not permitted. Monitoring would be conducted to ensure that the protective areas are maintained.
APM CR-3. Evaluate Significance of Unavoidable Cultural Resources	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 would be evaluated to determine their historical significance. Evaluation studies would be conducted and documented according to applicable laws, regulations, guidelines, and professional standards.
APM CR-3a. Evaluate Significance of Potentially Eligible Archaeological Resources	Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing. Evaluation of archaeological sites could 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 would be evaluated to consider their eligibility per CRHR Criterion 1 and NRHP Criteria A, C, and D.
APM CR-3b. Evaluate Significance of Potentially Eligible Buildings and Structures	Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation would take into account engineering, aesthetic, architectural, and other relevant attributes of each property. Buildings and structures would 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 would be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. The report would be filed with the appropriate Information Center of

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
	the California Historical Resources Information System.
APM CR-3c. Assist with Native American Consultations	If necessary, the applicant would assist BLM in consultations with Native Americans regarding traditional cultural values that may be associated with locations within the APE. Archaeological or other cultural resources associated with the project may have cultural values ascribed to them by Native Americans. The applicant would assist the BLM during consultation with Native Americans regarding Native American cultural remains.
APM CR-4. Minimize Unavoidable Impacts on Significant Cultural Resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties	The applicant would 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 on significant cultural resources. Impacts on significant cultural resources would be minimized by implementing the measures listed in APM CR-4a.
APM CR-4a. Implement Measures to Minimize Impacts on Significant Archaeological Sites	Prior to construction and during construction, the following measures would be implemented by the applicant to minimize unavoidable impacts on significant archaeological sites: • To the extent practical, all activities would minimize ground surface disturbance within the bounds of significant archaeological sites, historical resources, or historic properties. • Portions of significant archaeological sites, historical resources, or historic properties that can be avoided would be protected as environmentally sensitive areas and would remain undisturbed by construction activities. • Monitoring by qualified professionals and/or Native Americans to ensure that impacts on sites are minimized would 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 would be carried out at appropriate sites to ascertain whether project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials. • If impacts on significant archaeological (NRHP- or CRHR-eligible) sites eligible under NRHP Criterion D or CRHR Criterion 4 cannot be avoided, archaeological data recovery would be carried out in the portions of affected significant sites that would be impacted. A data recovery plan would 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 eligibility research questions for CRHR Criterion 4 or NRHP Criterion D. Archaeological data recovery would 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 would be filed with the BLM and the appropriate Information Center of the California Historical Resources Information System.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM CR-4b. Implement Measures to Minimize Impacts on Significant Buildings and Structures	Prior to construction and during construction, the applicant would implement the following measures to minimize unavoidable impacts on significant buildings and structures: • Locate proposed project facilities to minimize effects on significant buildings or structures. • If impacts on significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with the documentation standards of the National Park Service Historic American Buildings Survey/Historic American Engineering Record. • File reports and other documentation with the BLM, National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.
APM 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, the applicant would prepare a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan to be implemented if an unanticipated discovery is made. At a minimum the plan would detail the following elements: • Worker and supervisor training in the identification of cultural remains that could be found in the proposed project area, and the implications of disturbance and collection of cultural resources pursuant with the Archaeological Resources Protection Act of 1979 • 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 about the potential significance of any find • Identities of persons authorized to stop or redirect work that could affect the discovery, and their on-call contact information • Procedures for monitoring construction activities in archaeologically sensitive areas • A minimum radius around any discovery within which work would 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 a discovery • Procedures for consulting Native Americans when identifying and evaluating the significance of discoveries involving Native American cultural materials • Procedures to be followed for treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans.
APM CR-6. Inadvertent Discovery of Human Remains	Any human remains discovered during project activities in California would 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 would be treated under the appropriate State of Nevada statutes, including but not limited to Nevada Revised Statutes Chapter 440 and the regulations of the applicable land management agency. In the event that human remains are recovered on private lands, the landholder would have the right to designate the 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 are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains would be treated as defined in the Construction Monitoring and Unanticipated Cultural

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
	Resources Discovery Plan.
APM CR-7. Native American Participation	Prior to construction, BLM would consult with Native Americans identified by the NAHC as having cultural ties to particular areas of the proposed project. Native Americans would be invited to participate in significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, as well as in monitoring during project construction. Native Americans would be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during project activities.
Geology, Soils, Minerals, and Paleontology	
APM GEO-1: Geotechnical Engineering and Engineering Geology Study	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: Recommended Practices for Seismic Design of Substations	For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronics Engineers (IEEE) Standards Association Standard 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.
APM GEO-3: Project Construction Stormwater Pollution Prevention Plan Protection Measures Regarding Soil Erosion / Water Quality	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 stormwater pollution prevention plan (SWPPP). New access roads would be designed to minimize ground disturbance from grading. They would follow natural ground contours as closely as possible, and would include specific features for road drainage. Measures could include water bars, drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings would be constructed, they would be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.
APM PALEO-1: Retention of Paleontologist and Preparation of a Paleontological Resource Management Plan	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 APMs PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine whether 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 could be found in the PRMP.
APM PALEO-2: Pre-construction Paleontological Field Survey	The paleontologist and/or his or her designated representative would 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.
APM PALEO-3: Worker Environmental Awareness Program (see BIO-6, CR-2b, W-11)	A Worker Environmental Awareness Program 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.
APM 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 would 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-

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
	checked on a periodic basis to ensure that older underlying sediments were not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities had reached a depth 5 feet below the present ground surface and fine-grained strata were 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 were present.
APM PALEO-5: Recovery and Testing	If fossils were 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 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 were 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: 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 would be submitted for analysis.
APM PALEO-7: Analysis of and Preparation of Final Paleontological Resource Recovery Report	The project paleontologist would direct identification, laboratory processing, cataloging, 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.
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 final Paleontological Resource Recovery Report in a timely manner following construction.
Hazards, Health and Safety	
APM HAZ-1: Phase I ESA	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 ESAs would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to a company that specializes in this type of work and that would produce a comprehensive report for the new or expanded ROW. The comprehensive report is used to identify sites in federal, state, and local government agency databases that may have the potential to impact the proposed project; based on a review of the report, any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I ESA that 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 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.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM HAZ-2: Hazardous Materials and Waste Handling Management.	The applicant would develop programs and policies for management of hazardous materials including a Hazardous Materials and Hazardous Waste Handling Program, Construction Stormwater Pollution Prevention Plan, and procedures for Transport of Hazardous Materials, Fueling and Maintenance of Construction Equipment, Fueling and Maintenance of Helicopters, and Emergency Release Response. This Plan would be valid during project construction and operation.
APM HAZ-3: Soil Management Plan	The applicant would develop a Soil Management Plan that would provide guidance for the proper handling, onsite management, and disposal of impacted soil that might be encountered during construction activities.
APM HAZ-4: Fire Management Plan	The applicant would implement a Fire Management Plan.
APM HAZ-5: Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan.	The applicant would implement a Spill Prevention, Countermeasure, and Control Plan (SPCCP) for preventing, containing, and controlling potential releases; provisions for quick and safe cleanup and a Hazardous Materials Business Plan (HMBP) that would include hazardous waste management procedures; and emergency response procedures including emergency spill cleanup supplies and equipment. This plan would be valid during project construction and operation.
Hydrology and Water Quality	
APM W-1: Avoid Stream Channels	Construction equipment would be kept out of flowing stream channels.
APM W-2: Erosion Control and Hazardous Material Plans	Erosion control and hazardous material plans would be incorporated into the construction bidding specifications to ensure compliance.
APM W-3: Project Design Features	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, would 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.
APM W-4: Avoid Active Drainage Channels	Towers would 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	Diversion dikes would be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) could not 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: Collect and Divert Runoff	Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes.
APM W-7: Ditch and Drainage Design	Ditches and drainage devices would be designed to handle the concentrated runoff and located to avoid disturbed areas. They would have energy dissipations at discharge points that might include rip-rap, concrete aprons, and stepped spillways. 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: Minimize Cut and Fill Slopes	Cut and fill slopes would 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 would 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. BMPs in the project SWPPP would be implemented during construction to minimize the risk of an accidental release.
APM W-10: Emergency Release Response Procedures	The Emergency Release Response Procedures developed pursuant to APM Haz-1 would be maintained onsite (or in vehicles) during construction of the proposed project.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM W-11: Conduct a Worker Environmental Awareness Program (see BIO-6, CR-2b, PALEO-3)	A Worker Environmental Awareness Program (WEAP) would be conducted 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 would emphasize site-specific physical conditions to improve hazard prevention. It would 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. The applicant would document compliance and maintain a list of names of all construction personnel who had completed the training program.
APM W-12: Properly Dispose of Hazardous Materials	All construction and demolition waste, including trash and litter, garbage, and other solid waste, would be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials would be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
APM W-13: Identify Location of Underground Utilities Prior to Excavation	Prior to excavation, the applicant or its contractors would 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	The applicant would prepare or update SPCC plans for substations to minimize, avoid, and/or clean up unforeseen spill of hazardous materials during facility operations.
Land Use	
APM LU-1: Aeronautical Considerations	The applicant would submit notice to FAA electronically, in accordance with FAA procedures, and as far in advance of construction as possible.
Noise	
APM 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 to take advantage of low electrical draw periods during the nighttime hours. The applicant would comply with variance procedures requested by local authorities if required.
APM NOI-2: Construction Equipment Working Order	Construction equipment would be in good working order.
APM NOI-3: Construction Equipment Maintenance	Construction equipment would be maintained per manufacturer's recommendations.
APM NOI-4: Construction Equipment Muffled	Construction equipment would be adequately muffled.
APM NOI-5: Construction Equipment Idling Minimized	Idling of construction equipment and vehicles would be minimized during the construction.
APM NOI-6: Hearing Protection for Workers	Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan.
Public Services and Utilities	
APM 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.
APM 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.

Table ES-4 Applicant Proposed Measures

Applicant Proposed Measure	Description
Recreation	
APM REC-1: Recreation Area Closures	When temporary short-term closures to recreational areas are necessary for construction activities, the applicant would coordinate those closures with recreational facility owners. To the extent practicable, the applicant would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). The applicant would post notice of the closure on-site 14 calendar days prior to the closure.
Socioeconomics, Population and Housing, and Environmental Justice	
	The applicant has not included any APMs related to socioeconomics, population and housing, or environmental justice for the proposed EITP.
Traffic and Transportation	
APM 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.
APM 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.
APM TRA-3: Minimize Street Use	Construction activities will be designed to minimize work on, or use of, local streets.

Key:
ASTM = American Society for Testing Materials
BLM = Bureau of Land Management
BMP = Best Management Practices
CDFG = California Department of Fish and Game
CPUC = California Public Utilities Commission
CRHR = California Register of Historical Resources
EITP = Eldorado–Ivanpah Transmission Project
FAA = Federal Aviation Administration
GPS = Global Positioning System
HMBP = Hazardous Materials Business Plan
LST = Lattice Steel Tower
NAHC = Native American Heritage Commission
NDOW = Nevada Department of Wildlife
NRHP = National Register of Historic Places
PRMP = Paleontological Resource Management Plan
ROW = Right-of-Way
SAA = Streambed Alteration Agreement
SCE = Southern California Edison
SPCC = Spill Prevention, Control, and Countermeasure
SPCCP = Spill Prevention, Control, and Countermeasure Plan
SWPPP = Stormwater Pollution Prevention Plan
TSP = Tubular Steel Poles
USFWS = U.S. Fish and Wildlife Service
WEAP = Worker Environmental Awareness Program

ES.8 Major Conclusions

Construction of the EITP would result in a number of temporary impacts that would cease upon completion of the construction phase. Operation and maintenance of the proposed project or its alternatives could also result in potential temporary and permanent impacts.

The Draft EIR/EIS has identified significant and unavoidable adverse impacts that could result from construction, operation, and maintenance of the proposed project, including impacts on biological resources. Potentially significant adverse impacts could also occur to air quality. Under NEPA, the proposed project would result in major, adverse, and unavoidable impacts to aesthetics and visual resources for one of the eight key observation points (KOPs) analyzed. With mitigation, impacts to aesthetics and visual resources would be less than significant under CEQA. All other EITP impacts were determined to be less than significant, or could be reduced to a less than significant level with implementation of the mitigation measures proposed in the EIR/EIS.

A list of potential impacts that could result from construction, operation, and maintenance of the proposed EITP is provided in Table ES-5 and further discussed in Sections 3.2 through 3.14.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
3.2 Aesthetics and Visual Resources							
IMPACT AES-1: Adverse Impact to a Scenic Vista	Designated scenic vistas do not occur in the proposed project area. Construction would result in temporary generation of fugitive dust that would be visible within a Visual Resource Management (VRM) Class II area and from both the South McCullough Wilderness Area and the Wee Thump Joshua Tree Wilderness Area. The telecommunications Path 2, Section 1 would not be discernable as there is already an existing 500-kV transmission line in the viewshed.	Less than significant without mitigation	There are no designated scenic vistas in the vicinity of the proposed project; however, for the purposes of this analysis, the South McCullough Wilderness Area is treated as designated scenic vistas because the BLM manages these lands according to the most stringent restrictions to protect visual resources. For KOP 1 and KOP 2, no cumulative projects would be visible from this location, so no cumulative impact would occur.	Not cumulatively considerable	**APM AES-1:** Road Cut Rock Staining **APM AES-2:** Seeding and Inter-Planting **APM AES-3:** Non-Reflective Finish	NA	**Construction:** Minor adverse effects to visual resources temporarily due to construction activities. Aboveground construction– Minor, adverse, temporary effects to viewshed. Belowground construction– Temporary, moderate effects to viewshed. **O&M:** Minor, adverse, permanent effects to viewshed due to the introduction of taller towers and new structures, including the proposed Ivanpah Substation and the microwave tower. Of the eight KOP's evaluated, seven would conform with the established VRM or VRI classes and one would not conform In addition to APM AES-1 through APM AES-8, additional mitigation would be required to lessen impacts on visual resources to the greatest extent possible. Mitigation measures AES-1 and AES-2 would lessen the contrast in color and line that would be introduced by construction of the Ivanpah Substation, as shown in KOP 8.
IMPACT AES-2: Degrade Existing Visual Character or Quality	Overall, the proposed project would not result in substantial degradation of the landscape. The proposed project would conflict with VRM or VRI objectives for one of the eight Key Observation Points (KOPs). At each of these locations, the proposed project would introduce strong levels of contrast with the existing structures in the viewshed by introducing linear elements of a larger scale and more prominent color.	Less than significant with mitigation	Temporary impacts on visual resources during construction would contribute incrementally to impacts on visual resources from the cumulative projects for KOP 4, KOP 5, KOP 6, and KOP 8 by introducing new color and line into views and by altering the existing texture of the landscape. During operations and maintenance, the proposed project would result in a moderate change in the color of the landform, and a moderate contrast with existing structures in the background of KOP 8.	Cumulatively considerable (construction) Moderate impact (O&M)	**APM AES-4:** Regrade / Revegetate Construction Sites **APM AES-5:** Use Existing Access Roads **APM AES-6:** Minimize Road Modifications. **APM AES-7:** Dust Suppression	**MM AES-1:** Painting the Ivanpah Substation **MM AES-2:** Rock Staining near the Ivanpah Substation	See above.
IMPACT AES-3: Create a New Source of Light or Glare	Lighting would only be installed for the proposed Ivanpah Substation, which would only be required for non-routine nighttime work and be shielded to eliminate off-site light spill (APM AES-8).	Less than significant without mitigation	Project lighting would be shielded, directed downward, and used only for emergency repairs or maintenance. The project's contribution to light and glare would be infrequent.	Not cumulatively considerable	**APM AES-8:** Substation Lighting Control	NA	See above.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
3.3 Air Quality							
IMPACT AIR-1: Conflict or Obstruct the Implementation of Applicable Air Quality Plan	Construction activities would not conflict with or obstruct implementation of the Mojave Desert Planning Area Air Quality Attainment Plan. Construction emissions would be temporary and would be a small fraction of the regional emission inventory included in the plan. No long-term impacts associated with operation and maintenance are anticipated for the proposed project.	Less than significant without mitigation	This impact was not considered cumulatively significant, since construction of the proposed project would not conflict with or obstruct implementation of the Mojave Desert Planning Area Air Quality Attainment Plan.	Not cumulatively considerable	The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulation	N/A	**Construction:** Short-term, moderate impacts on ambient air quality. Construction emissions would be a very small fraction of the regional emissions. The project could not conflict with or obstruct implementation of California or Nevada SIPs. **O&M:** No long-term impacts associated with operation and maintenance would occur.
IMPACT AIR-2: Temporary Ambient Air Quality Impacts Caused by Construction Activities Would Violate or Contribute Substantially to an Air Quality Violation	The estimated average daily emissions of $PM_{2.5}$, PM_{10}, and NO_X from project construction activities would exceed the Mojave Desert Air Quality Management District (MDAQMD) daily significance thresholds. The comparison of average daily emissions to significance thresholds was based on conservative assumptions about daily equipment use. Impacts would be limited to the duration of project construction; long-term and operational impacts would not occur. Implementation of MM AIR-1and MM AIR-2 would reduce potential impacts, but would not likely reduce emissions from construction activities to below the MDAQMD daily significance thresholds.	Significant	Foreseeable projects could exceed the daily construction emission thresholds for the same or different criteria pollutants as the EITP. The emissions would be localized to those locations under construction. These temporary cumulative increases in criteria pollutants could lead or contribute to violations of ambient air quality standards. Mitigation measures are not expected to reduce emissions from project construction activities to below the MDAQMD daily significance thresholds.	Cumulatively considerable (construction only)	The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulation	**MM AIR-1:** Low-emission Construction Equipment. **MM AIR-2:** Enhanced Dust Control Measures	**Construction:** Short-term, moderate impacts on ambient air quality. $PM_{2.5}$, PM_{10}, and NO_X emissions would temporarily exceed MDAQMD daily significant thresholds, even with MM AIR-1 and MM AIR-2. **O&M:** No long-term impacts associated with operation and maintenance would occur.
IMPACT AIR-3: Temporary Emission Increases of NOx, VOCs, and PM_{10} during Construction Would Contribute to a Cumulatively Considerable Net Increase of a Criteria Pollutant in a Non-Attainment Area	Project construction would occur in an area designated non-attainment for ozone and PM_{10}. The estimates of average daily emissions of PM_{10} and NO_X from project construction activities exceed the Mojave Desert Air Quality Management District (MDAQMD) daily significance thresholds. The comparison of average daily emissions to significance thresholds was based on conservative assumptions about daily equipment use. Mitigation measures MM AIR-1 and MM AIR-2 would be implemented to reduce potential impacts, but these mitigation measures would not likely reduce PM_{10} and NO_X emissions from construction activities to below the MDAQMD daily significance thresholds.	Significant	The estimated average daily emissions would exceed MDAQMD daily construction emission significance thresholds for NO_x, PM_{10}, and $PM_{2.5}$. This threshold would not necessarily be exceeded daily, but it could be, if all components of the proposed project were to be constructed simultaneously. In addition, increases in PM_{10}, NO_x, and VOCs from reasonably foreseeable future projects could contribute to a considerable net increase of criteria pollutants in a non-attainment area.	Cumulatively considerable (construction only)	The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulation	**MM AIR-1:** Low-emission Construction Equipment. **MM AIR-2:** Enhanced Dust Control Measures	**Construction:** Short-term, moderate impacts on ambient air quality. $PM_{2.5}$, PM_{10}, and NO_X emissions would temporarily exceed MDAQMD daily significant thresholds, even with MM AIR-1 and MM AIR-2. **O&M:** No long-term impacts associated with operation and maintenance would occur.
IMPACT AIR-4: Temporarily Expose Sensitive Receptors to Substantial Pollutant Concentrations	Diesel particulate emissions would be generated during project construction. The only receptor identified as being close to the proposed project construction area is the Desert Oasis Apartment Complex, where residents could be exposed to short-term increased pollutant concentrations. The project would not be located near schools, day care centers, hospitals, or other sensitive receptors.	Less than significant without mitigation	Although possible, it is unlikely that reasonably foreseeable future projects would have overlapping construction schedules near the Desert Oasis Apartment Complex. Even if the construction schedules overlapped, construction activities would be only for several days in the area of potential exposure; therefore, there would not be a significant cumulative impact.	Not cumulatively considerable	The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulation	N/A	**Construction:** Short-term, moderate impacts on ambient air quality. **O&M:** No long-term impacts associated with operation and maintenance would occur.
IMPACT AIR-5: Temporarily Create Objectionable Odors Due to Fuel Combustion that would Affect a Substantial Number of People	Odors created during construction from the combustion of fuel would likely not cause a perceptible odor to a substantial number of people. If perceptible, such impacts would be temporary and would be limited to the duration of the project construction period. Vehicle emissions during project operation would be minimal, so no objectionable odors are expected.	Less than significant without mitigation	As discussed above, although unlikely, the Calnev pipeline expansion could have an overlapping construction schedule at this location, but the overlap would only be for a day or two. Even if the construction schedules overlapped, construction activities would be only for several days in the area of potential exposure, there would not be a significant cumulative impact.	Not cumulatively considerable	N/A	N/A	**Construction:** Short-term, moderate impacts on ambient air quality. **O&M:** No long-term impacts associated with operation and maintenance would occur.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
IMPACT AIR-6: Generate GHG Emissions That May Have A Significant Impact On The Environment	GHG emissions increases that would result during the EITP operations would not be expected to individually have a significant impact on global climate change. Therefore, the impact of the generation of GHG emissions would be less than significant. Even though the generation of GHG emissions from the proposed project would be less than significant, the applicant would be required to follow and/or consider best management practices to reduce the potential for GHG emissions (see Mitigation Measure MM-AIR-3).	Less than significant without mitigation	This analysis considered the proposed project's contribution to global climate change, which was determined to be less than significant. This analysis may change following the upcoming publication of the revised CEQA guidance on GHGs.	Not cumulatively considerable		**MM AIR-3:** Best Management Practices for GHG Reduction.	**Construction:** Short-term, moderate impacts on ambient air quality. **O&M:** No long-term impacts associated with operation and maintenance would occur.
3.4 Biological Resources							
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	The proposed project would result in impacts on special-status plants. Implementation of MMs BIO-1, 2, and 3 would reduce impacts to less than significant because preconstruction surveys would identify the location of any special-status plants so they could be avoided by project activities. If plants could not be avoided, mitigation for impacts would occur in the form of salvage and/or restoration efforts for vegetation and soils.	Less than significant with mitigation	Impacts on habitat fragmentation could be significant when combined with impacts from other regional projects. The development of numerous large-scale projects would result in a substantial permanent conversion of desert habitat to industrial/commercial uses. EITP, in conjunction with other projects, would result in cumulative impacts on native vegetation communities, including cacti and yucca species, and adversely affect special management areas due to temporary and permanent habitat loss from ground disturbance and inadvertent distribution of noxious weeds. Cumulative impacts from the projects would primarily affect the desert valley vegetation, as most proposed disturbance is outside the tops of the mountain ranges.	Cumulatively considerable	**APM BIO-1:** Preconstruction Surveys **APM BIO-2:** Minimize Vegetation Impacts **APM BIO-4:** Best Management Practices **APM BIO-5:** Biological Monitors **APM BIO-6:** Worker Environmental Awareness Program **APM BIO-9:** Facility Siting **APM AES-4:** Regrade / Revegetate Construction Sites **APM AES-6:** Minimize Road Modifications **APM AES 7:** Dust Suppression	**MM BIO-1:** Preconstruction Surveys **MM BIO-2:** Reclamation Plan **MM BIO-3:** Special Status Plants Restoration and Compensation Plan	**Construction and O&M:** Adverse effects on biological resources. After mitigation, impacts on native desert vegetation and special-status plants would be minor and localized.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	Potential impacts on several special-status wildlife species and their habitat, including: reptiles, mammals, and birds, with potential for significant impacts to desert tortoise, desert bighorn sheep, American badger, and burrowing owl. Implementation of MMs BIO-8 through BIO-16 would reduce impacts to less than significant, except for desert tortoise; impacts to desert tortoise and its habitat would be significant even after mitigation. If avoidance of direct and indirect impacts to wildlife were not possible, those impacts would be mitigated by species-specific measures detailed in MMs BIO-12 through BIO-16.	Significant	The contribution of EITP to cumulative impacts on wildlife would be short term and limited due to the short duration of construction and the relatively small geographical extent of EITP's impact area. Cumulative impacts on biological resources could be exacerbated as a result of project schedules. Construction of multiple projects within the same time period can result in greater impacts from emissions, noise, construction equipment and vehicle traffic, and overall habitat degradation and loss. Removal of vegetation and/or long-term restoration efforts could negatively impact common and special status wildlife. If projects were to be constructed consecutively, project impacts would be reduced in intensity but	Cumulatively considerable	**APM BIO-1:** Preconstruction Surveys **APM BIO-4:** Best Management Practices **APM BIO-5:** Biological Monitors **APM BIO-6:** Worker Environmental Awareness Program **APM BIO-10:**Invasive Plant Management **APM AES-6:** Minimize Road Modifications **APM AES-8:** Substation Lighting	**MM BIO-8:** Reduce Night Lighting **MM BIO-9:** Cover Steep-walled Trenches or Excavations During Construction **MM BIO-10:** Biological Monitors **MM BIO-11:** Water Usage **MM BIO-12:** Desert Tortoise Impacts Reduction Measures **MM BIO-13:** Desert Bighorn Sheep Impacts Reduction Measures **MM BIO-14:** American Badger Impacts Reduction Measures	**Construction and O&M:** Adverse effects on biological resources. Direct and indirect impacts to wildlife would be reduced to minor and localized. Impacts on desert tortoise due to construction of the project would be adverse, moderate, both short term and long term, and localized.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
			prolonged in duration, resulting in adverse impacts on the life cycles of species and/or resulting in prolonged or permanent displacement of wildlife from critical habitats.		Control **APM NOI-4:** Construction Equipment Muffled **APM NOI-5:** Construction Equipment Idling Minimized **APM W-12:** Properly Dispose of Hazardous Materials	**MM BIO-15:** Migratory Birds and Raptors Impacts Reduction Measures **MM BIO-16:** Burrowing Owl Impacts Reduction Measures	
IMPACT BIO-3: Temporary and permanent losses of native vegetation communities	Potential impacts on sensitive desert vegetation communities, including cacti and yucca species. Implementation of MMs BIO-1 through BIO-3 would reduce impacts to less than significant with the use of preconstruction surveys, avoidance techniques, and post-construction restoration.	Less than significant with mitigation	EITP and other reasonably foreseeable future projects have the potential to have an adverse cumulative impact on populations and individuals of rare plant species such as Mojave milkweed, desert pincushion, Parish's club-cholla, white-margined beardtongue, rosy two-tone beardtongue, and Aven Nelson phacelia that occur within the cumulative effects area. However, each of these projects have provided recommended mitigation measures such as avoidance, salvage, restoration, and compensation to reduce impacts to special status plants to less than significant. Over the cumulative effects area, the EITP would have a negligible contribution to cumulative impacts to special status plant populations.	Not cumulatively considerable	**APM BIO-1:** Preconstruction Surveys **APM BIO-2:** Minimize Vegetation Impacts **APM BIO-4:** Best Management Practices **APM BIO-5:** Biological Monitors **APM BIO-6:** Worker Environmental Awareness Program **APM BIO-9:** Facility Siting **APM BIO-10:** Invasive Plant Management	**MM BIO-1:** Preconstruction Surveys **MM BIO-2:**Reclamation Plan **MM BIO-3:** Special Status Plants Restoration and Compensation	**Construction and O&M:** Adverse effects on biological resources. After mitigation implementation, impacts on native desert vegetation and special-status plants would be minor and localized.
IMPACT BIO-4: Introduction of invasive, non-native, or noxious plant species	Potential impacts on sensitive vegetation and wildlife communities if invasive, non-native, or noxious plant species were introduced and/or spread within the project area. Implementation of MM BIO-4 would reduce impacts to less than significant with implementation of a rigorous Invasive Management Plan..	Less than significant with mitigation	Cumulative impacts on sensitive vegetation and wildlife communities would result if invasive, non-native, or noxious plant species were introduced and/or spread within the geographic extent area. The contribution of EITP to these cumulative impacts would be short term and limited due to the short duration of construction and the relatively small geographical extent of EITP's impact area.	Not cumulatively considerable	**APM BIO-1:** Preconstruction Surveys **APM BIO-2:** Minimize Vegetation Impacts **APM BIO-4:** Best Management Practices **APM BIO-5:** Biological Monitors **APM BIO-6:** Worker Environmental Awareness Program **APM BIO-9:** Facility Siting **APM BIO-10:** Invasive Plant Management	**MM BIO-4:** Model Invasive Plant Management Plan on the BLM Las Vegas Office DRAFT Weed Plan	**Construction and O&M:** Adverse effects on biological resources. After mitigation implementation, impacts on native desert vegetation and special-status plants would be minor and localized.
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	Potential impacts on jurisdictional waters, drainages, and wetlands. Implementation of MMs BIO-5 through BIO-7 would reduce impacts to less than significant level. The applicant would perform a final jurisdictional determination to identify drainages and wetlands located within the proposed project area. These areas would then be avoided.	Less than significant with mitigation	Cumulative impacts from all projects on these resources could be significant. The contribution of EITP to these cumulative impacts would be short term and limited due to the short duration of construction and the relatively small geographical extent of EITP's impact area.	Not cumulatively considerable	**APM BIO-2:** Minimize Vegetation Impacts **APM BIO-3:** Avoid Impacts on State and Federal Jurisdiction Wetlands	**MM BIO-5:** Jurisdictional Delineation **MM BIO-6:** Drainage Crossings Design **MM BIO-7:** Mitigation Monitoring	**Construction and O&M:** Adverse effects on biological resources.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
	If avoidance were not possible, drainage crossings would be engineered to reduce degradation and impacts (MM BIO-6) and restoration and compensation measures would be implemented (MM BIO-7).				**APM BIO-4:** Best Management Practices **APM BIO-9:** Facility Siting **APM HAZ-2:** Hazardous Materials and Waste Handling Management **APM HAZ-5:** Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan. **APM W-1:** Avoid Stream Channels **APM W-2:** Erosion Control and Hazardous Material Plans **APM W-4:** Avoid Active Drainage Channels **APM W-9:** Prepare and Implement and Approved SWPPP	Plan for Affected Jurisdictional Areas	
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	Potential impacts to the movement corridors, migratory paths, or critical nursery sites for certain species, such as desert bighorn sheep, large reptiles, wild burro, and desert tortoise. Critical habitat found within the EITP area would be potentially used as a movement corridor by desert tortoise. Noise and visual disturbances generated during construction, operations, and maintenance would cause stress to animals, potential death, and avoidance of known corridors or nursery sites by species. Disturbances would be relatively short term due to the linear nature of construction for the transmission and telecommunication lines. Operations and maintenance activities would likewise be short term due to the lower frequency of vehicle and equipment use. Impacts at the proposed Ivanpah Substation would be long-term, as existing natural vegetation would be replaced with impervious surfaces and permanent structures. Implementation of MMs BIO-1, BIO-8, BIO-10, and BIO-12 through BIO-16 would provide protection primarily through avoidance of sensitive movement and nursery areas.	Less than significant with mitigation	With the exception of desert tortoise, EITP contribution to cumulative impacts on wildlife species would be minor. EITP would contribute 0.001% of the future cumulative impacts on non-critical desert tortoise habitat, and 0.004% on critical habitat. The small percentage from EITP would result in a minor impact, but cumulatively, the impacts on this species could be considerable. Currently, cumulative impacts on desert tortoise are considered major and considerable.	Cumulatively considerable	**APM BIO-4:** Best Management Practices **APM BIO-5:** Biological Monitors **APM BIO-6:** Worker Environmental Awareness Program **APM BIO-7:** Avoid Impacts on Active Nests **APM BIO-8:** Avian Protection **APM BIO-9:** Facility Siting **APM BIO-11:** Desert Tortoise Measures **APM BIO-12:** Desert Bighorn Sheep Measures **APM BIO-13:** Western Burrowing Owl Measures **APM BIO-14:** Gila Monster and Chuckwalla Measures	**MM BIO-1:** Preconstruction Surveys **MM BIO-8:** Reduce Night Lighting **MM BIO-10:** Biological Monitors **MM BIO-12:** Desert Tortoise Impacts Reduction Measures **MM BIO-13:** Desert Bighorn Sheep Impacts Reduction Measures **MM BIO-14:** American Badger Impacts Reduction Measures **MM BIO-15:** Migratory Birds and Raptors Impacts Reduction Measures **MM BIO-16:** Burrowing Owl Impacts Reduction Measures **MM BIO-17:** Gila Monster Compliance. **MM BIO-18:** Avian Protection Plan.	**Construction and O&M:** Adverse effects on biological resources. Direct and indirect impacts to wildlife would be reduced to minor and localized. Impacts on desert tortoise due to construction of the project would be adverse, moderate, both short term and long term, and localized. Project would have minor adverse, short- and long-term, localized impacts on Gila monster and chuckwalla. Adverse impacts to desert bighorn sheep would be localized and minor, with both short- and long-term impacts with incorporation of mitigation. Mitigation would reduce the adverse impacts on American badger to localized, minor, and short and long term. Impacts on MBTA bird species, including raptors, would be adverse, minor, short and long term, and localized.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
							Recommended mitigation for burrowing owl would reduce impacts, which would be adverse and short and long term, to localized and minor.
IMPACT BIO-7: Conflict with the provisions of local ordinances or policies	The project could remove existing desert vegetation during construction. Impacts to stream riparian vegetation would also occur during construction. San Bernardino County requires retention of existing native desert vegetation, in particular Joshua trees, Mojave yuccas, and creosote rings. The applicant would implement APM BIO-2 and BIO-3 to reduce adverse effects. However, if sensitive desert and riparian vegetation could not be avoided, the proposed project would result in significant impacts and directly conflict with the San Bernardino County ordinances. With implementation of MMs BIO-2 and BIO-3, vegetative communities will be restored by the relocation of plants, reseeding, and/or land compensation. If communities cannot be restored, the applicant will compensate in accordance with consultation with appropriate agencies. Implementation of these measures would reduce impacts to less than significant.	Less than significant with mitigation		Not cumulatively considerable	**APM BIO-2:** Minimize Vegetation Impacts **APM BIO-3:** Avoid Impacts on State and Federal Jurisdiction Wetlands	**MM BIO-2:** Reclamation Plan **MM BIO-3:** Special Status Plants Restoration and Compensation	**Construction and O&M:** Adverse effects on biological resources.
BIO-8: Conflict with the provisions of the Clark County MSHCP and the BCCE.	The proposed project would result in impacts on biological resources (Impacts BIO-1 through BIO-6) on lands under the jurisdiction of the Clark County MSHCP, as the transmission and telecommunication lines cross lands conserved by these plans. Species specifically targeted for conservation and protection by these plans would be potentially impacted by the project. Additionally, the project intersects numerous areas that have undergone MSHCP mitigation actions by the BLM, such as re-vegetation restoration efforts, noxious weed removal, and fencing associated with desert tortoise protection (see Figures 5-1 and 5-5). These restoration areas could be impacted by vegetation removal and the potential introduction of noxious weeds. These impacts would be long-term and significant, thus mitigation is required to reduce impacts. The applicant would be required to initiate discussions with Clark County about appropriate fee-based compliance and other mitigation strategies to ameliorate biological impacts on non-federal lands as discussed in MM-LU-1, Section 3.9, "Land Use." This compliance would be directly based on the provisions of the MSHCP. Compliance for the MSHCP would cover those biological species protected by the MSHCP. Thus, by complying with these provisions, impacts to the MSHCP within the proposed project boundaries would be reduced to less than significant. The construction of the EITP, as proposed along the existing ROW, would be compatible with the primary purpose of the MSHCP, which is to minimize adverse impacts on natural resources within the HCP conservation area.	Less than significant with mitigation		Not cumulatively considerable	N/A	**MM LU-1:** Obtain Approval from Clark County and the City of Boulder City for Activities Outside of BLM-Designated Utility Corridors in the BCCE	minor adverse
Cumulative Impact BIO-C-1: Habitat Fragmentation, Degradation, and Loss	The relevant impacts resulting from the EITP are IMPACT BIO-1 through BIO-6. Cumulative impacts to biological resources can be either additive (that is, directly proportional in severity to the quantity	Cumulative impacts from all projects on these habitat resources could be significant.	The EITP would have relatively minor impacts on habitat fragmentation, assuming land temporarily disturbed during construction (425.9 acres) would be restored to its original state to the greatest extent possible. However, these	Cumulatively considerable	See APMs corresponding to IMPACTS BIO-1 through BIO-6	See MMs corresponding to IMPACTS BIO-1 through BIO-6	The contribution of the EITP to these cumulative impacts would be short term and limited, due to the short temporal duration of construction and the relatively limited geographical

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	of the resource affected, such as vegetation loss or wetland fill) or exponential. For exponential impacts, increasing levels become disproportionately more substantial if they affect biological features that are critical to the survival of a species. An example of an exponential impact is habitat fragmentation, where the result of the construction of multiple projects in a particular area results in fragmentation of areas that formerly provided contiguous habitat into separate areas too small to support dependent species. The EITP has a relatively small construction footprint, despite its linear extent, is limited in duration (18 months), and requires a maximum of 190 construction workers. Most of the elements of the EITP would be constructed within an existing ROW where the native vegetation has already been disturbed, with the exception of the Ivanpah Substation, one of the proposed microwave towers, and new access roads, which, together, would temporarily and permanently impact approximately 372 acres of vegetation (see Section 3.4.1.1, “Existing Conditions”). The EITP would have relatively minor impacts on habitat fragmentation, assuming land temporarily disturbed during construction (425.9 acres) would be restored to its original state to the greatest extent possible. However, these impacts could be significant when combined with impacts from other regional projects. The development of numerous large-scale projects, such as ISEGS, DesertXpress, Silver State, other wind and solar generation facilities, and the SNSA would result in a substantial permanent conversion (approximately 112,000 acres) of desert valley and mountain top habitat to industrial/commercial uses. This could have significant effects on a variety of species through direct habitat loss and/or habitat fragmentation.	The contribution of the EITP to these cumulative impacts would be short term and limited, due to the short temporal duration of construction and the relatively limited geographical extent of the EITP’s impact area. The EITP’s contribution to cumulative impacts is further reduced through avoidance and minimization measures.	impacts could be significant when combined with impacts from other regional projects. The development of numerous large-scale projects, such as ISEGS, DesertXpress, Silver State, other wind and solar generation facilities, and the SNSA would result in a substantial permanent conversion (approximately 112,000 acres) of desert valley and mountain top habitat to industrial/commercial uses. This could have significant effects on a variety of species through direct habitat loss and/or habitat fragmentation. The EITP, in conjunction with other projects, would result in cumulative impacts on native vegetation communities, including cacti and yucca species, and adversely affect special management areas due to temporary and permanent habitat loss from ground disturbance and inadvertent distribution of noxious weeds, as described in Section 3.4, “Biological Resources.” Specifically, ISEGS would disturb approximately 3,600 acres of Mojave creosote scrub, DesertExpress would disturb approximately 280 acres of mesquite scrub and Joshua tree woodlands; Silver State Solar would disturb 2,967 acres of habitat types including desert scrub, desert wash, and desert woodlands. Thus, in conjunction with the EITP, cumulative impacts to native desert vegetation communities would be approximately 7,220 acres of disturbance. These impacts would be both temporary and permanent, as restoration of habitat back to its baseline condition has a temporal aspect: creosote, Joshua trees, and conifer forests take much longer to re-colonize an area as opposed to smaller cacti and perennial plant species. Birds, bats, reptiles, and other wildlife rely on these vegetation types for forage and nesting opportunities. Removal of vegetation and/or long-term restoration efforts could negatively impact common and special-status wildlife. Cumulative impacts from the projects would affect the desert valley vegetation located along the desert floor and lower bajada slopes, as well as vegetation typically characterizing the desert mountain ridges (i.e. pinyon-pine and juniper woodland and upper elevation scrub).				extent of the EITP’s impact area. The EITP’s contribution to cumulative impacts is further reduced through avoidance and minimization measures.
Cumulative Impact BIO-C-2: Special-Status Species	The relevant impacts from the EITP are IMPACT BIO-1 and BIO-2. Although for many future developments specific data are not available, impacts on desert tortoise and bighorn sheep are quantified here as an example of the extent of wildlife impacts	Each of these projects has recommended mitigation measures such as avoidance, salvage, restoration, and compensation to	One potential impact from reasonably foreseeable future projects, including the EITP, could be habitat loss over a large area. The use of both desert tortoise and bighorn sheep as potential indicators for cumulative impacts is appropriate to address large-scale disturbance	Cumulatively considerable	See APMs corresponding to IMPACTS BIO-1 and BIO-2	See MMs corresponding to IMPACTS BIO-1 and BIO-2	If recommended mitigation measures are applied over the cumulative impacts area, the EITP would have a negligible contribution to cumulative impacts to special-status plant populations.

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Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
	that could occur in desert valley and upper mountain habitat within the EITP cumulative analysis area. Desert tortoise has commonly been used as an indicator species to illustrate broader-ranging potential impacts on desert habitat and wildlife. Bighorn sheep could similarly be used as an indicator of potential impacts to mountainous areas and the wildlife species that utilize that niche such as migratory birds and large mammals. The range of the desert tortoise encompasses virtually all of the cumulative impact area (Figure 5-5), incorporates most of the habitat types that would be used by other potentially impacted species such as American badger, Gila monster, and desert birds, and includes the locations of the majority of the past, present, and future cumulative projects evaluated in this analysis. Additionally, tortoise populations have been eliminated or reduced in large parts of their ranges in California and in areas near Las Vegas as a result of human activities and disease (USFWS 2008a). This historical decline, coupled with potential impacts from future projects, makes any future impacts potentially significant. The range of the desert tortoise is limited at higher elevations, as the species is generally not found above 5,000 feet. In contrast, desert bighorn sheep are well-adapted to the higher elevations of desert mountain ranges, and in the EITP cumulative area, are known to occupy the Clark, Spring, and McCullough Mountain ranges. These mountains provide forage, shelter, and potential critical lambing areas for the sheep, in addition to serving as large-scale migratory pathways among the desert valleys.	reduce impacts to special-status plants to less than significant. Similar mitigation measures have been included for the EITP to reduce impacts. If these measures are applied over the cumulative impacts area, the EITP would have a negligible contribution to cumulative impacts to special-status plant populations. Overall, contributions from the EITP to habitat loss and potential impacts to special-status wildlife would be minor. However, cumulative impacts on desert tortoise could be major and considerable.	and/or loss of desert valley and mountain habitat. Coupled with historical losses, this extensive habitat loss would result in significant cumulative impacts. As discussed in Section 5.3.3.2, there are currently approximately 240,500 acres of habitat that have been disturbed (approximately 238,000 acres) and/or converted to infrastructure (approximately 3,000 acres). Reasonably foreseeable future projects are expected to result in approximately 112,000 acres of habitat disturbance/loss. Of that, future wind projects encompass approximately 57,000 acres of upper desert valley and mountain tops within the cumulative study area. As currently proposed, the EITP would contribute less than 0.060 percent to future cumulative impacts on non-critical desert tortoise habitat and 0.055 percent on critical habitat (Table 5-7). A total of approximately 2.0 acres and 94 acres of critical habitat in California and Nevada, respectively, would be impacted by the EITP. The small percentage of desert valley habitat loss from EITP would result in a minor cumulative impact. The EITP would also result in modification of desert mountain habitat within the Clark and McCullough Mountains, affecting approximately 150 acres of mountain pass and lower bajada slope areas. This would be a small contribution (0.3 percent, or 150/57,000 acres) to cumulative desert mountain habitat loss as compared to other future projects sited in mountainous areas. Overall, contributions from the EITP to habitat loss and potential impacts to special-status wildlife would be minor. However, cumulative impacts on desert tortoise could be major and considerable.				Overall, contributions from the EITP to habitat loss and potential impacts to special-status wildlife would be minor. However, cumulative impacts on desert tortoise could be major and considerable.
3.5 Cultural Resources							
IMPACT CR-1: Impacts to Cultural Resource 36-10315 (CA-SBR-10315H)	Potential impacts to cultural resources would occur as a result of the proposed transmission line replacement. The applicant has conducted APM CR-1 to identify the extent of resources in the proposed project area. Further, implementation of APM CR-2, APM CR-3b, and APM CR-4b would help minimize impacts on cultural resources APM CR-4b would require documentation of the cultural resource according to the National Park Service Historic American Buildings Survey/Historic American Engineering Record standards. This documentation would be filed with the California Historical Resources Information System, the Nevada State Historic Preservation Office, and the BLM.	Less than significant without mitigation	Cumulative impacts to other known cultural resources were not considered to be significant or considerable at the cumulative level contingent on proper mitigation by all projects. If adequate measures and mitigations were implemented by all the foreseeable construction projects that could affect other known cultural resources, then there would not be cumulatively considerable impacts to known cultural resources.	Not cumulatively considerable	**APM CR-1:** Conduct Archaeological Inventory of Areas that May Be Disturbed **APM CR-2:** Avoid and Minimize Impacts on Significant Cultural Resources Wherever Feasible **APM CR-3b:** Evaluate Significance of Potentially Eligible Buildings and Structures **APM CR-4b:** Implement Measures to Minimize Impacts on Significant Buildings and Structures	N/A	**Construction:** Direct, adverse, and permanent impact to Cultural Resource 36-10315 (CA-SBR-10315H) **O&M:** No impacts are anticipated during this phase.

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Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
IMPACT CR-2: Impacts to Previously Unidentified Cultural Resources	Major long-term direct impacts to any subsurface unidentified cultural resources would occur as a result of disturbing the ground and altering the existing setting, as well as disturbing the context of the find and its associations with other resources in the area. Project disturbance would diminish the resource's scientific or cultural integrity. Implementation of MM CR-1, APM CR-5, APM CR-6 and would reduce potential impacts to less than significant levels. Additionally, APM CR-2b would reduce these potential impacts to less than significant levels by educating the construction crew on the penalties associated with not reporting a cultural find or of collecting artifacts from federal- or state-controlled land.	Less than significant with mitigation	Cumulative impacts to unidentified cultural resources were not found to be significant or cumulatively considerable assuming proper mitigation by all projects. Subsurface cultural resources could be unearthed by any projects developed in previously undisturbed areas. If adequate measures and mitigations were implemented by all the foreseeable construction projects, then there would not be cumulatively considerable impacts to previously unidentified cultural resources.	Not cumulatively considerable	**APM CR-1:** Conduct Archaeological Inventory of Areas that May Be Disturbed **APM CR-2b:** Conduct a Preconstruction Worker Environmental Awareness Program (see BIO-6, PALEO-3, and W-11). **APM CR-5.** Prepare and Implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan **APM CR-6.** Inadvertent Discovery of Human Remains	**MM CR-1:** Cultural Resources Monitoring **MM CR-3:** Archaeological Resources Protection Act (ARPA) Training.	**Construction:** Unanticipated discovery of cultural resources as a result of construction activities disturbance could also diminish its scientific or cultural integrity. **O&M:** No impacts are anticipated during this phase.
IMPACT CR-3: Unanticipated Discovery of Human Remains	No resources with human remains or features known to be likely to contain human remains were discovered during the background research or field studies for the EITP. However, potential major long-term direct impact on human remains if there were unanticipated discoveries of human remains during construction. APM CR-6 would reduce impacts on human remains as a result of inadvertent discoveries during construction activities.	Less than significant without mitigation	Cumulative impacts to human remains were not found to be significant or cumulatively considerable assuming proper mitigation by all projects. Subsurface human remains could be unearthed by any projects developed in previously undisturbed areas. If adequate measures and mitigations were implemented by all the foreseeable construction projects, then there would not be cumulatively considerable impacts to previously unidentified human remains.	Not cumulatively considerable	**APM CR-6.** Inadvertent Discovery of Human Remains	N/A	**Construction:** Unanticipated discovery of cultural resources as a result of construction activities disturbance could also diminish its scientific or cultural integrity. **O&M:** No impacts are anticipated during this phase.
Removal of portions of historic resources (NEPA Only Impact).	Construction of the EITP would result in a direct, adverse, and permanent impact to Cultural Resources 36-10315 (CA-SBR-10315H) by altering the setting and disturbing elements of the site that contribute to its historic significance. The construction plans call for removal of portions of historic resources; however, as discussed under mitigation measure (MM) CR-2, the resources would be documented according to Historic American Engineering Record (HAER) level 2 standards and potential impacts would be minimized or reduced to less than significant.	N/A	Construction of the DesertXpress and ISEGS projects would also result damage to, removal of, or destruction of segments of the Boulder Dam–San Bernardino 132-kV Transmission Line (36-10315 [CA-SBR-10315H]), similar to the impact of the EITP on this cultural resource. Therefore, the construction of these three projects could result in a cumulatively considerable impact to this cultural resource. The proposed project's contribution to cumulative impacts would be mitigated through adequate documentation. If adequate measures and mitigations were implemented by all the foreseeable construction projects that could affect other known cultural resources, then there would not be cumulatively considerable impacts to known cultural resources.	Cumulatively considerable	N/A	**MM CR-2:** Historic American Engineering Record Recordation.	Negligible, localized adverse

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3.6 Geology, Soils, Minerals, and Paleontology							
IMPACT GEO-1: Rupture of Earthquake Fault Across the Transmission Line Route	Given the relative lack of active faults in the project area, the potential for exposure of people to fault rupture during construction of the transmission line is very low. Similarly, the potential for adverse effects of fault rupture during operation and maintenance is also unlikely during the life of the proposed project. MM GEO-2 strengthens APM GEO-1 by stating that the applicant will use the findings of the geotechnical analysis to guide engineering and design.	Less than significant without mitigation	There would not be a considerable cumulative impact to geologic resources in the cumulative effects area. Seismic impacts (groundshaking, earthquake-induced ground failure, and fault rupture) from the numerous local and regional faults are an impact of the geologic environment on individual projects or existing and would not introduce considerable cumulative impacts.	Not cumulatively considerable	**APM GEO-1:** Geotechnical Engineering and Engineering Geology Study	N/A	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT GEO-2: Exposure of People or Structures to Potential Adverse Effects Due to Seismic Ground Shaking	Project construction and operations and maintenance activities could impact people and structures by exposing them to adverse effects due to seismic ground shaking during construction. Due to the short nature of construction and infrequent nature of significant ground shaking in the project area, potential adverse effects to people would be less than significant without mitigation. Design considerations outlined in APM GEO-2 would further lessen the potential for adverse effects. The likelihood that people would be exposed to adverse effects during project operations and maintenance is limited; structures would be more likely to experience an impact. Any impact would be short term and localized for the proposed project, although the causative event would affect a larger region.	Less than significant without mitigation	There would not be a considerable cumulative impact to geologic resources in the cumulative effects area. Seismic impacts (groundshaking, earthquake-induced ground failure, and fault rupture) from the numerous local and regional faults are an impact of the geologic environment on individual projects or existing and would not introduce considerable cumulative impacts.	Not cumulatively considerable	**APM GEO-1:** Geotechnical Engineering and Engineering Geology Study **APM GEO-2:** Recommended Practices for Seismic Design of Substations	N/A	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT GEO-3: Exposure of People or Structures to Potential Adverse Effects Due to Seismic-Related Ground Failure	For most of the proposed project area, seismic-related ground failure is not expected, due to the general lack of shallow groundwater. Potential for negligible impact would be highly localized only in those areas that may be susceptible to seismic-related ground failure during construction include structures located at or near playa fringes. Under APM GEO-1, the applicant would complete a geotechnical engineering study to identify site-specific geologic conditions and potential geologic hazards prior to final engineering.	Less than significant without mitigation	There would not be a considerable cumulative impact to geologic resources in the cumulative effects area. Seismic impacts (groundshaking, earthquake-induced ground failure, and fault rupture) from the numerous local and regional faults are an impact of the geologic environment on individual projects or existing and would not introduce considerable cumulative impacts.	Not cumulatively considerable	**APM GEO-1:** Geotechnical Engineering and Engineering Geology Study **APM GEO-2:** Recommended Practices for Seismic Design of Substations	N/A	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT GEO-4: Exposure of People or Structures to Adverse Effects Due to Landslides	Potential impacts from construction- or operations-caused landslides on people or structures would be localized, but effects could extend over a long time. Installing, upgrading, or re-grading access roads could lead to landslides at locations where geologic conditions are conducive to this type of hazard, such as in areas on or adjacent to hill slopes. Geologic conditions would also occur in areas on or adjacent to Operation and maintenance activities could also expose people and structures to landslide hazards during the life of the project. Implementation of APM GEO-1 and MM GEO-2 would lessen potential effects to less than significant levels.	Less than significant without mitigation	There are no highly sensitive geologic formations in the project area. Therefore, there would not be a considerable cumulative impact to geologic resources in the cumulative effects area. From the available information, no reasonably foreseeable future projects indicate plans to significantly alter sensitive geologic formations. However, the available information is limited.	Not cumulatively considerable	**APM GEO-1:** Geotechnical Engineering and Engineering Geology Study	**MM GEO-1:** Monitor and Mitigate Damage to Tower Structures	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT GEO-5: Erosion of Soil at Towers and the Substation and Along Access Roads	The proposed project would impact soil by resulting in erosion at the transmission and telecommunication towers, at the substation, and along the access roads. This impact would be localized but would act over the entire construction period.	Less than significant with mitigation	Structural impacts from unstable soils are an impact of the geologic environment on individual projects and would not introduce considerable cumulative impacts.	Not cumulatively considerable	**APM GEO-3:** Project Construction Stormwater Pollution Prevention Plan Protection Measures Regarding Soil Erosion / Water Quality	**MM GEO-2:** Geotechnical Engineering Study	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans.

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	Operation and maintenance on service roads would lead to continued ground disturbance that would result in sites of potential erosion, particularly in areas of hill slopes. This impact would be localized but could act over the life of the proposed project, could be significant. With the implementation of APM GEO-3 and MM W-1, impacts on soil conditions would be reduced.						**O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT GEO-6: Structural Failure of Towers and Substation Facility Due to Unstable Soil Conditions Resulting in Subsidence or Collapse	Ground subsidence or collapse due to groundwater withdrawal or dehydration of clays between the soil surface and the water table could lead to the structural failure of the transmission line and telecommunication line towers and substation facility. This adverse impact on the project, ranging from negligible to minor, could be localized to extensive, depending on the degree to which continued and/or increased groundwater withdrawal from the Ivanpah and Eldorado valleys. The likelihood of this impact could increase over time with continued and/or increased groundwater withdrawal. With implementation of MM W-2, MM GEO-1 and MM GEO-2, this impact would be reduced to a minor or less than significant level.	Less than significant with mitigation	Structural impacts from unstable soils are an impact of the geologic environment on individual projects and would not introduce considerable cumulative impacts.	Not cumulatively considerable	**APM GEO-1:** Geotechnical Engineering and Engineering Geology Study **APM GEO-2:** Recommended Practices for Seismic Design of Substations	**MM GEO-1:** Monitor and Mitigate Damage to Tower Structures **MM GEO-3:** Preparation and Implementation of SWPPP	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT GEO-7: Structural Failure of Towers or Substation Facility Due to Expansive Soils	The areas most prone to experience expansive soils lie within or adjacent to playas or old lake deposits with clay rich sediments. Although prior to final design a geotechnical engineering study would be performed (APM GEO-1), impacts on proposed project facilities could be significant. With the implementation of MM GEO-4, however, impacts under this criterion would be less than significant.	Less than significant with mitigation	Structural impacts from unstable soils are an impact of the geologic environment on individual projects and would not introduce considerable cumulative impacts.	Not cumulatively considerable	**APM GEO-1:** Geotechnical Engineering and Engineering Geology Study	**MM GEO-4:** Expansive Soils Mitigation	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
IMPACT MR-1: Loss of Mineral Resource of Value to Region and the Residents of the State	The potential for mineral resources in the project vicinity is area-wide. Numerous non-metallic and metallic mineral deposits occur along or near the telecommunications line route. Proposed future activities at mines can easily avoid the proposed project area. Any identified adverse impacts at current mines are negligible. There are a few past and current mining locations in the vicinity of the proposed project, but none, except the aboveground portion of the Mountain Pass Telecommunications Alternative, would be within 1,000 feet of either side of the proposed telecommunications line route. The Molycorp Mine would be within 1,000 feet of the Mountain Pass Telecommunications line ~~or~~ alternative routes. Since no specific locations for valuable mineral resources have been identified within the project area, there would be no loss of availability of a known mineral resource as a result of the proposed project.	Less than significant without mitigation	None of the reasonably foreseeable future projects in the cumulative effects area are expected to interfere with active mining operations. The proposed project would be on land designated as an energy corridor. The land is not eligible for mining, and the project would not limit any existing mining claims. Therefore, incremental impact of the proposed project on any cumulative impacts on minerals would be negligible or less than significant.	Not cumulatively considerable	N/A	N/A	**Construction:** Direct negligible impacts to minor geology and soils, generally local in extent, ranging to extensive to area wide, and acting over either short- or long-term time spans. **O&M:** No additional ground disturbance beyond the areas disturbed during construction.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
IMPACT PALEO-1: Direct or Indirect Damage or Destruction of Paleontological Resources	Project-related ground disturbance could impact buried and undiscovered paleontological resources. APMs PALEO-1 through PALEO-8 would help reduce impacts on paleontological resources discovered during the preconstruction and construction phases.	Less than significant without mitigation	Paleontological resources are known to be present in the geographic area of reasonably foreseeable future projects, particularly those projects that would be located near the dry lakes. If resources were discovered during construction of these projects, they would be subject to legal requirements designed to protect them, thereby reducing impacts. Therefore, proposed project impacts combined with impacts from past, present, and reasonably foreseeable projects would not be significant and no additional mitigation measures would be necessary.	Not cumulatively considerable	**APM PALEO-1:** Retention of Paleontologist and Preparation of a Paleontological Resource Management Plan **APM PALEO-2:** Pre-construction Paleontological Field Survey **APM PALEO-3:** Worker Environmental Awareness Program **APM PALEO-4:** Construction Monitoring **APM PALEO-5:** Recovery and Testing **APM PALEO-6:** Monthly Progress Reports **APM PALEO-7:** Analysis of and Preparation of Final Paleontological Resource Recovery Report **APM PALEO-8:** Curation	N/A	**Construction:** Potential for adverse impacts on paleontological resources **O&M:** No additional ground disturbance beyond the areas disturbed during construction.
3.7 Hazards, Health, and Safety							
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	During construction, hazards to the public or the environment might be caused by the transport, use, or disposal of hazardous materials including (but not limited to) gasoline, diesel fuel, oil, paints, chemicals, waste oils, and construction waste. APM HAZ-2 would prevent releases of hazardous materials and waste. During operation and maintenance, hazards to the public or the environment also could be caused by the improper transport, storage, use or disposal of hazardous materials. APM HAZ-5 and MM HAZ-1 would help ensure that the applicant would minimize, avoid, and/or clean up spills of hazardous materials. In addition, MM HAZ-4 would require that project-related debris be tested prior to disposal; MM HAZ-5 would require that potential backfill material be proven contaminant-free; and MM HAZ-6 would ensure that the applicant obtain an EPA Identification Number and receive authorization from a local CUPA, if necessary.	Less than significant with mitigation	Cumulative effects of hazardous materials spills and potential exposures could only occur in the immediate vicinity of the proposed project area. It is unlikely that there would an incident where multiple projects would have a hazardous materials release in close proximity to each other such that could be cumulative effects. Any release of hazardous materials would have to be remediated according to state and federal regulations.	Not cumulatively considerable	**APM HAZ-2:** Hazardous Materials and Waste Handling Management **APM HAZ-5:**Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan.	**MM HAZ-1:** Worker Health and Safety and Environmental Training and Monitoring Program **MM HAZ-4:** Disposal of Demolition Materials. **MM HAZ-5:** Backfill Material. **MM HAZ-6:** EPA Identification Number.	**Construction:** Hazards such as accidents or spills from improper use, storage, or disposal of oil and/or hazardous materials would be minor, short term, and localized. **O&M:** The applicant would implement APM HAZ-5 to facilitate quick and safe cleanup of accidental spills of hazardous materials. Implementation of MM HAZ-1 would reduce the risk of exposure to workers and the public and minimize the potential for release of hazardous aterials.
IMPACT HAZ-2: Create Hazards through Accidental Release of Hazardous Materials into the Environment	The proposed project would not traverse any known contaminated sites, but would traverse and be in close proximity to fuel product pipelines where there could be soil contamination. Prior to any grading activities, the applicant would be required by law to use an Underground Service Alert organization to identify the location of underground utilities and pipelines.	Less than significant with mitigation	Cumulative effects of hazardous materials spills and potential exposures could only occur in the immediate vicinity of the proposed project area. It is unlikely that there would an incident where multiple projects would have a hazardous materials release in close proximity to each other such that could be cumulative effects. Any	Not cumulatively considerable	**APM PUSVC-1:** Work Around High Pressure Pipelines **APM PUSVC-2:** Monitoring by Pipeline Companies **APM HAZ-2:** Hazardous Materials and Waste Handling	**MM HAZ-1:** Worker Health and Safety and Environmental Training and Monitoring Program **MM HAZ-4:** Disposal of Demolition Materials. **MM HAZ-5:** Backfill Material.	**Construction:** Hazards such as accidents or spills from improper use, storage, or disposal of oil and/or hazardous materials would be minor, short term, and localized. **O&M:** The applicant would implement APM HAZ-5 to facilitate quick and safe

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	In addition, the applicant would not use APM PUSVC-1, APM PUSVC-2, APM HAZ-2 and APM HAZ-3 to reduce potential adverse effects. Implementation of MM HAZ-1 would protect the workforce during construction and operation of the EITP. In addition, MM HAZ-4 would require that project-related debris be tested prior to disposal; MM HAZ-5 would require that potential backfill material be proven contaminant-free; and MM HAZ-6 would require that the applicant obtain an EPA Identification Number and receive authorization from a local CUPA, if necessary.		release of hazardous materials would have to be remediated according to state and federal regulations.		Management **APM HAZ-3: Soil Management Plan**	**MM HAZ-6:** EPA Identification Number.	cleanup of accidental spills of hazardous materials. Implementation of MM HAZ-1 would reduce the risk of exposure to workers and the public and minimize the potential for release of hazardous aterials.
IMPACT HAZ-3: Expose the Public or Environment to Contaminated Soil or Groundwater	The proposed components may encounter undocumented hazardous waste sites during construction. However, the applicant has committed to conducting a Phase 1 ESA (APM HAZ-1) to identify recognized environmental conditions in the vicinity of the ROW prior to the start of construction to ensure that contaminated areas would be avoided. In addition, MM HAZ-3 would require the applicant to submit a work plan to the appropriate agency for its review and approval prior to initiating any remediation work, and MM HAZ-5 would require that potential backfill material (if used) be properly sampled and determined to be contaminant-free.	Less than significant without mitigation	It is unlikely that the proposed project and other reasonable foreseeable projects would be constructed in the same location at the same time. Because any soil contamination encountered would be removed and/or remediated prior to construction, impacts of the proposed project would not combine with impacts of other projects, and there would not be a considerable cumulative effect.,	Not cumulatively considerable	**APM HAZ-1:** Phase I ESA	**MM HAZ-3:** Agency Coordination and Approvals. **MM HAZ-5:** Backfill Material.	minor, localized, and short term.
IMPACT HAZ-4: Increase Safety Hazards for People Residing or Working Within Two Miles of a Public Airport or Public Use Airport	The only existing airport within the project area is the Jean Airport, 5 miles away; therefore, there would be no impact associated with existing airports within 2 miles of the proposed project. The proposed boundary for the Southern Nevada Supplemental Airport (SNSA) would be within 0.5 miles (2,640 feet) north of MP 26 of the EITP transmission line; however it is not possible to state conclusively whether the EITP would impact the future SNSA. Under APM LU-1, the applicant would notify the FAA as far in advance of construction as possible. To further reduce potential hazards associated with the future airport, the applicant has requested Hazard/No Hazard Determinations for structures within 20,000 feet of the airport boundary and will implement MM HAZ-2, which requires that the applicant comply with all FAA requirements upon construction of the SNSA.	Less than significant with mitigation	The proposed EITP transmission line would be constructed within 0.5 miles of the southern boundary of the proposed Southern Nevada Supplemental Airport (SNSA) that is scheduled for completion by 2020. At this time, it is not possible to assess the cumulative potential airport risks at the proposed SNSA because insufficient information is available about SNSA and the proposed projects that would be located within 20,000 feet of the SNSA.	Unknown	**APM LU-1:** Aeronautical Considerations	**MM HAZ-2:** Comply with FAA Requirements Upon Construction of the SNSA.	With respect to potential hazards to aviation, FAA has recommended distances between power lines and navigational equipment. The applicant would coordinate with FAA (MM HAZ-2) and notify the FAA in advance of construction (APM LU-1) to ensure that the EITP did not interfere with proposed navigational facilities and flight paths. Implementation of MM HAZ-4 and MM HAZ-6 would further require that the applicant properly identifies and disposes of hazardous construction waste. With respect to potential hazards to aviation, the applicant would notify the FAA in advance of construction (APM LU-1). Additionally, the applicant will comply with all FAA requirements upon construction of the SNSA (MM HAZ-2) which would ensure that the EITP does not interfere with proposed navigational facilities and flight paths.
IMPACT HAZ-5: Impair Implementation of or Physically Interfere with an Adopted Emergency Response Plan or Emergency Evacuation Plan	During construction and operation, activities that could affect traffic and emergency routes include equipment delivery necessitating lane closures and stringing lines across major and local roadways. If lane closures were necessary for construction or maintenance of the EITP, the applicant would implement APM TRA-1and APM TRA-2. The applicant would also implement BMPs, such as use of flaggers, identification of detours, and appropriate communications with stakeholders.	Less than significant without mitigation	Concurrent construction of the proposed project and ISEGS, FirstSolar, NextLight, the CalNev Pipeline Expansion Project, and DesertXpress could increase traffic congestion and flow; therefore, there could be cumulative impacts to access and use of emergency routes. Overall, a considerable increase in traffic congestion could result in a cumulative impact; however, traffic management plans would likely reduce this impact so that it would not be considerable.	Not cumulatively considerable	**APM TRA-1:** Obtain Permits **APM TRA-2:** Traffic Management and Control Plans	N/A	Negligible, localized, and short term.

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IMPACT HAZ-6: Expose People or Structures to Wildland Fires	During construction and operation of the EITP (all components), fires might be caused by combustion of native materials due to smoking, refueling, or operating vehicles and other equipment off roadways; welding; electrical arcing; or a fallen conductor. The applicant's Fire Management Plan (APM HAZ-4) establishes standards and practices that would minimize the risk of fire and, in the event of fire, provide for immediate suppression and notification.	Less than significant without mitigation	The Ivanpah Valley in California has a moderate fire risk. In Nevada, the fire risk outside of Primm is not known, although the city of Primm has a low fire risk. Concurrent construction of the foreseeable construction in California could increase the fire risks. However, each project would likely implement its own fire management program to reduce the potential risk of fires.	Not cumulatively considerable	**APM HAZ-4:** Fire Management Plan	N/A	Negligible, localized.
3.8 Hydrology and Water Quality							
IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater	Although the hydrology of the area would prevent any spill that occurred from migrating quickly or far and groundwater in this region is located between 100 and 500 feet below the surface, there is the potential adverse impacts on surface and groundwater resources due to hazardous contamination during construction and operation and maintenance of the lines and substation. With proper implementation of APM HAZ-2, APM W-1, APM W-2, MM W-1 and MM W-6, the potential impact on surface water quality from erosion would be reduced to less than significant levels.	Less than significant with mitigation		Not cumulatively considerable	**APM W-2:** Erosion Control and Hazardous Material Plans **APM W-10:** Emergency Release Response Procedures **APM W-12:** Properly Dispose of Hazardous Materials **APM W-13:** Identify Location of Underground Utilities Prior to Excavation	**MM W-1:** Erosion Control Plan and Compliance with Water Quality Permits **MM W-6:** DESCP, SWPPP, and Grading and Storm Water Management Plan for Ivanpah Substation.	**Construction:** Potential for the introduction of hazardous contamination into surface water resources would be minor, localized, and short term. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-2: Lowering of Water Table or Interference with Aquifer Recharge	. The proposed project could have small impacts on local groundwater levels and on aquifer recharge processes by altering surface water drainages and increasing groundwater withdrawal over current conditions. During construction, the applicant would avoid stream channels (APM W-1), collect and divert runoff (APM W-6), and develop ditch and drainage design (APM W-7). These measures would allow for infiltration of surface water and subsequent groundwater recharge at rates consistent with preconstruction conditions. The applicant would also use water for dust suppression during construction. The potential for lowering local groundwater levels during construction would be negligible, localized, and short term. The applicant has agreed to a maximum water use of between 32,000 and 40,000 gpd for the duration of project construction. This equates to between 30.6 and 38.3 acre-ft/yr and a pump rate of 35 gpm. As described in Section 3.8.1.5, the applicant has arranged to acquire this water from existing wells at the Molycorp Mine Mountain Pass facility within the Ivanpah and Shadow Valley fresh water production well fields. The proposed project would require 35 gpm, or 2.3 percent, of the available water from the well fields. Molycorp currently uses only a small fraction of this water and has agreed that there would be sufficient water available for the proposed project. To limit excessive groundwater withdrawals, MM W-2 sets maximum water use limits for the construction and operation phases of the proposed project. By limiting the maximum water use, construction of the proposed project would result in less than significant impacts	Less than significant with mitigation	The capacity of the local aquifer is not currently known. The town of Primm and the Primm Valley Golf Course are drawing upon water in the Ivanpah Valley. If all the water needed to support the foreseeable projects were drawn from the local water table, there could be a considerable cumulative impact on the local water table. The proposed project's contribution would depend on the volume of water to be drawn from the local aquifer and the total amount drawn by the other foreseeable projects. Further, the area of new impervious surfaces of the proposed project would not alter groundwater recharge within the local basins, so it would not contribute to a considerable cumulative impact.	Cumulatively considerable	APM W-**1:** Avoid Active Stream Channels **APM W-6:** Collect and Divert Runoff. **APM W-7:** Ditch and Drainage Design.	**MM W-2:** Water Use Maximum	**Construction:** The potential for lowering local groundwater levels during construction would be negligible, localized, and short term **O&M:** Similar to those of current operations of the existing transmission line.

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IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	Potential for increased erosion or siltation on site or off site due to project construction and operation and maintenance activities. Construction ground disturbance may change natural runoff patterns, thereby affecting natural erosion and siltation processes. Water used for dust suppression during construction could suspend and transport more sediment than is typically moved in the arid climate. Implementation of APM W-1, APM w-4, APM w-6, APM W-7, and APM W-8 would help minimize changes to surface drainage patterns and reduce stormwater velocity where changes would occur. In addition, MM W-1 and MM W-6 would ensure that all BMPs and county plan erosion practices are adhered to, erosion and siltation levels would be kept consistent with preconstruction conditions	Less than significant with mitigation	Past projects have altered drainage patterns by changing local topography. Each time a site is graded and developed, natural drainage features are culverted, redirected, or, in the case of small desert washes, eliminated. Insufficient data are available to be able to predict the exact nature of the cumulative alterations. The proposed project's contribution to cumulative impacts, however, would be localized and relatively small given its footprints for construction (470 acres) and operations (60 acres).	Not cumulatively considerable	**APM W-3:** Project Design Features **APM W-4:** Avoid Active Drainage Channels **APM W-5:** Diversion Dikes **APM W-6:** Collect and Divert Runoff **APM W-7:** Ditch and Drainage Design **APM W-8:** Minimize Cut and Fill Slopes	**MM W-1:** Erosion Control Plan and Compliance with Water Quality Permits	**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-4: Altered Course of Stream or River due to Modification of Surface Drainage Patterns	The proposed project could cause alteration of the course of a stream due to modification of surface drainage patterns. Construction activities causing ground disturbance and alteration of natural drainage patterns could cause a change in the hydrologic inputs to a stream, thus affecting the flow volume or route. Changes to surface contours could be permanent and could affect the stream flow over the long term. MM W-3 requires the applicant to predict any alteration in flow paths as a result of construction of the proposed project and establish a channel system to mitigate any impacts associated with altered flow paths. MM W-4 (Restoration of Dry Lake) requires the applicant to restore the lake surface to preconstruction conditions, therefore reducing this impact to less than significant levels.	Less than significant with mitigation	Past projects have altered drainage patterns by changing local topography. Reasonable foreseeable future projects that would be constructed on the floors of the Ivanpah or Eldorado valleys could also alter drainage patterns. Insufficient data are available to be able to predict the exact nature of the cumulative alterations. However, the proposed project's contribution to cumulative impacts would be localized and relatively small given its footprints for construction and operations.	Not cumulatively considerable	**APM W-1:** Avoid Stream Channels **APM W-4:** Avoid Active Drainage Channels	**MM W-3:** Onsite Flow Model and Channel System **MM W-4:** Dry Lake Restoration Plan	**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-5: Modified Runoff Characteristics That Exceed Existing Stormwater Systems, Possibly leading to Flooding or Inundation by Mudflow	The proposed project would be unlikely to cause flooding or inundation by mudflow. However, the EITP area is in a region known for active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. Construction activities causing ground disturbance could change natural runoff patterns, thereby affecting volume and flow of surface and subsurface waters and possibly affecting flooding patterns of local waterways. The applicant would implement APM W-1, APM W-4, APM W-5, APM W-6, APM W-7, and, as required by law, implement a SWPPP (APM W-9). As a part of MM W-5, the applicant would also analyze all alluvial fans in the project area to determine the most active sections. Following this analysis, proposed project components would be sited on the least active areas of the fans to reduce the possibility of floods or debris flows.	Less than significant with mitigation	EITP and other foreseeable projects would be required to take erosion and drainage control measures to reduce the potential adverse effects of flood events; therefore, the potential cumulative risks would be reduced. As long as the foreseeable projects did the appropriate hydrologic modeling to site their facilities in the areas with lowest flood risk and their structures were designed to accommodate a 100-year, 24-hour flood event, there would not be a significant cumulative impact to flood risks. However, most of the reasonably foreseeable projects have not completed their environmental analysis, so it is not possible to determine if all the proper steps will be taken	Not cumulatively considerable	**APM W-5:** Diversion Dikes **APM W-6:** Collect and Divert Runoff **APM W-7:** Ditch and Drainage Design	**MM W-5:** Historical Hydrological Model of Alluvial Fan	**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-6: Substantially Degrade Water Quality	The proposed project could degrade water quality by increasing erosion or sedimentation in surface waters or through the introduction of hazardous materials into surface waters. Potential impacts from the introduction of hazardous materials would be less than significant without mitigation. Implementation of MMs W-1, W-3, and W-6 would reduce potential impacts due to erosion and sedimentation to less than	Less than significant with mitigation	There could be considerable cumulative impacts to public safety due to debris flow. However, the proposed project's contribution to cumulative public safety risks associated with flooding would be minor and long term. Because the proposed project would have a smaller footprint than many of the foreseeable projects in the Ivanpah and Eldorado valleys and	Not cumulatively considerable	**APM W-2:** Erosion Control and Hazardous Material Plans **APM W-4:** Avoid Active Drainage Channels **APM W-9:** Prepare and Implement an Approved SWPPP	**MM W-1:** Erosion Control Plan and Compliance with Water Quality Permits **MM W-3:** Onsite Flow Model and Channel System	**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. Potential for the introduction of hazardous contamination into surface water resources would be minor,

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	significant levels.		the towers would be designed to resist scour, debris flows would be more likely to pass proposed project structures without dislodging them.				localized, and short term. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-7: Placement of Structures within a 100-year Flood Hazard Area	Transmission line tower footings would be constructed within a 100-year flood hazard area through the Ivanpah Dry Lake. Additionally, the telecommunications line would cross through a 100-year flood hazard zone near Nipton Road. The Ivanpah Substation would not be located in a 100-year flood hazard zone. Due to the relatively flat topography of the flood hazard areas, the risk associated with this hazard would be minor. The applicant would design tower footings to withstand scour and inundation from a 100-year flood (APM W-3). This measure would ensure that flooding at tower footings would not pose a safety risk.	Less than significant without mitigation	The EITP and all other foreseeable projects with project components within a 100-year flood zone would have to undertake similar measures to reduce this potential cumulative impact. However, given the number of new structures in the area, there could be an increase in the volume of flood waters diverted. The proposed project would have only a less than significant or negligible contribution to this cumulative impact because of small role is the potential diversion of flood waters.	Not cumulatively considerable	**APM W-3:** Project Design Features **APM W-5:** Diversion Dikes		**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. Potential for the introduction of hazardous contamination into surface water resources would be minor, localized, and short term. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-8: Exposure to a Significant Risk of Flooding	The proposed project area is in a region with active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. However, it is unlikely that project facilities or construction equipment would actually impede or redirect a flood flow. The applicant would implement APM W-1, APM W-4, APM W-5, and APM W-7 to ensure that active drainage channels were not hindered by construction activity. As a part of MM W-5, the applicant would analyze the alluvial fans in the project area to determine the most active sections. Following this analysis, the project facilities would be sited on the least active lobes of the alluvial fans to mitigate against floods or debris flows and their inherent threat to life and property.	Less than significant with mitigation	The EITP transmission tower footings would be designed to withstand scour and inundation from a 100-year flood (APM W-3). All other foreseeable projects with project components within a 100-year flood zone would have to undertake similar measures to reduce this potential cumulative impact. However, given the number of new structures in the area, there could be an increase in the volume of flood waters diverted. The proposed project would have only a less than significant or negligible contribution to this cumulative impact because of small role is the potential diversion of flood waters.	Not cumulatively considerable	**APM W-1:** Avoid Stream Channels **APM W-4:** Avoid Active Drainage Channels **APM W-5:** Diversion Dikes **APM W-7:** Ditch and Drainage Design	**MM W-5:** Historical Hydrological Model of Alluvial Fan.	**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. **O&M:** Similar to those of current operations of the existing transmission line.
IMPACT HYDRO-9: Modify Runoff Characteristics, Possibly Leading to Flooding or Inundation by Mudflow	The proposed project area is in a region with active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. However, it is unlikely that project facilities or construction equipment would actually impede or redirect a flood flow. The applicant would implement APM W-1, APM W-4, APM W-5, and APM W-7 to ensure that active drainage channels were not hindered by construction activity. As a part of MM W-5, the applicant would analyze the alluvial fans in the project area to determine the most active sections. Following this analysis, the project facilities would be sited on the least active lobes of the alluvial fans to mitigate against floods or debris flows and their inherent threat to life and property.	Less than significant with mitigation	The EITP transmission tower footings would be designed to withstand scour and inundation from a 100-year flood (APM W-3). All other foreseeable projects with project components within a 100-year flood zone would have to undertake similar measures to reduce this potential cumulative impact. However, given the number of new structures in the area, there could be an increase in the volume of flood waters diverted. The proposed project would have only a less than significant or negligible contribution to this cumulative impact because of small role is the potential diversion of flood waters.	Not cumulatively considerable	**APM W-1:** Avoid Stream Channels **APM W-4:** Avoid Active Drainage Channels **APM W-5:** Diversion Dikes **APM W-7:** Ditch and Drainage Design	**MM W-5:** Historical Hydrological Model of Alluvial Fan.	**Construction:** Minor to moderate localized impacts due to erosion and sedimentation. Special consideration due to location on active alluvial fans. **O&M:** Similar to those of current operations of the existing transmission line.

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3.9 Land Use, Grazing Allotments, and Wild Horses and Burros							
IMPACT LU-1: Conflict with applicable Plans and Policies	The proposed project would cross various land uses in both California and Nevada: • The Boulder City Conservation Easement (BCCE, managed by Clark County and the City of Boulder City) with specific utility corridors reserved to the BLM. • Land designated as the Ivanpah Airport Environs Overlay for the Southern Nevada Supplemental Airport (SNSA). • A small area of private land in unincorporated Clark County. MM LU-1 requires that the applicant comply with the terms of the Interlocal Agreement (as Amended) between Clark County and the City of Boulder City, including Exhibit D to the Agreement, and acquire approval for activities outside of the BLM-designated corridor within the BCCE. Additionally, MM HAZ-1 includes Worker Environmental Awareness Training to ensure best management practices are implemented in order to be compatible with adjacent BCCE land uses (policies such as road designations, speed limits, and restrictions on camping in the area). In order to ensure that there are no impacts related to land use planning efforts for the future SNSA, the applicant would adhere to the policies of the South County Land Use Plan. Additionally, MM HAZ-2 requires that the applicant comply with all FAA requirements when the SNSA is constructed.	Less than significant with mitigation	EITP's contribution to total grazing acreage loss to the Clark Mountain Allotment (less than half of one percent of total available). The proposed project would be routed through the BCCE. No reasonably foreseeable future project is proposed within this conservation easement, so there would not be any cumulative impacts.	Not cumulatively considerable	**APM LU-1:** Aeronautical Considerations	**MM LU-1:** Obtain Approval from Clark County and the City of Boulder City for Activities Outside of BLM-Designated Utility Corridors in the BCCE **MM HAZ-1:** Worker Health and Safety and Environmental Training and Monitoring Program **MM HAZ-2:** MM HAZ-2: Comply with FAA Requirements Upon Construction of the SNSA.	**Construction:** Short-term, localized, negligible adverse impacts on the Ivanpah Dry Lake Recreation Area, the Jean/Roach Dry Lake SRMA and the Hidden Valley grazing allotment. **O&M:** Long-term, localized, negligible adverse effects on the Clark Mountain grazing allotment
3.10 Noise							
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	Project construction would comply with local noise ordinances and variance procedures requested by local authorities. In addition, as part of the project, the applicant has committed to maintaining construction equipment in working order (APM NOI-2) and adhering to the manufacturer's maintenance recommendations (APM NOI -3); muffling construction equipment (APM NOI-4); and minimizing the amount of time that equipment is idled (APM NOI-5). Implementation of MM NOI-1 would ensure that noise impacts at the Desert Oasis Apartment Complex would be reduced, such that impacts would be less than significant.	Less than significant with mitigation	The estimated combined construction noise at the Primm Valley Golf Course of the proposed Ivanpah Substation, the EITP transmission line, likely noise generated from the construction of the Calnev Pipeline, ISEGS, and First Solar would be 59 dBA with pile driving at the ISEGS project and 57 dBA without pile driving. The estimated cumulative noise level does not exceed San Bernardino County's allowable noise level of 60 dBA for other commercial purposes; therefore, there would not be a considerable cumulative impact.	Not cumulatively considerable	**APM NOI-1:** Compliance with Local Noise Ordinances **APM NOI-2:** Construction Equipment Working Order **APM NOI-3:** Construction Equipment Maintenance **APM NOI-4:** Construction Equipment Muffled **APM NOI-5:** Construction Equipment Idling Minimized	**MM NOI-1:** Conduct Construction Activities during Daytime Hours	**Construction:** Temporary, minor, and localized adverse impacts at residences located at the Desert Oasis Apartment Complex due to project construction. **O&M:** No impact. Corona noise would be barely audible and would not change current conditions. Negligible adverse noise impacts due to maintenance activities.
IMPACT NOI-2: Transmission line operation and maintenance noise exceeding noise levels or standards	During the worst-case foul weather conditions, substation noise and corona noise associated with operation would be just audible. This level is less than the standards of the noise ordinances of the two applicable counties. Maintenance activities would typically occur over short timeframes up to two times per month and generate minimal noise. The applicant would use noise reduction measures to be compatible with local plans and zoning.	Less than significant without mitigation	No cumulatively considerable impacts on noise levels or standards are anticipated during operations and maintenance of the proposed EITP and other foreseeable projects in the area.	Not cumulatively considerable	N/A	N/A	**O&M:** No impact. Corona noise would be barely audible and would not change current conditions.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
IMPACT NOI-3: Generate groundborne vibration or groundborne noise that exceeds 75 vdb during construction	Construction activities may generate groundborne vibration and noise. At the nearest residential receptor (the Desert Oasis Apartment Complex, a distance of .01 miles from the line), the vibration level generated by the greatest source of construction vibration (loaded truck) would temporarily exceed 75 VdB; however, this would occur during daytime hours and be short-term and temporary.	Less than significant without mitigation	Concurrent construction of the proposed EITP and other foreseeable projects could increase, but could also have no affect on, the level of groundborne vibration and noise at the Desert Oasis Apartment Complex. Insufficient data are currently available to calculate the level. However, the combined impact of future projects could only be for a day or two at the nearest receptor. Because of the short duration and as long as construction of all projects was limited to daytime hours, the cumulative impact would be less than significant.	Not cumulatively considerable	N/A	N/A	**Construction:** Temporary, minor, and localized adverse impacts at residences located at the Desert Oasis Apartment Complex due to project construction.
IMPACT NOI-4: Groundborne vibration or groundborne noise due to operations	During worst-case foul weather conditions, substation noise and the corona noise associated with operation would be considerably less than existing noise levels. The sum of the existing noise levels at the nearest sensitive receptor and the modeled maximum corona noise levels during foul weather would result in 47 dBA; therefore, no perceptible increase would occur and operation of the proposed project.	Less than significant without mitigation	No cumulatively considerable impacts due to groundborne vibration or groundborne noise are expected during operations and maintenance of the proposed EITP and other foreseeable projects in the area.	Not cumulatively considerable	N/A	N/A	**O&M:** No impact.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	Construction noise would not be anticipated to exceed 78 dBA at the closest sensitive receptor (Desert Oasis Apartment Complex). Any increases in ambient noise levels due to construction activities in the project vicinity would be short-term, intermittent, and temporary. With the implementation of MM NOI-1, and with additional noise minimization procedures (MM NOI-2 through MM NOI-5) implemented as needed, construction of the proposed project would result in a less than significant impact under this criterion.	Less than significant with mitigation	The cumulative impact from reasonably foreseeable future project development within 2 miles of receptors near Primm Valley Golf Club in California and the Desert Oasis Apartment Complex in Primm, Nevada would be equivalent to the direct impact from the proposed project, which was evaluated as minor, short term, and localized, and less than significant because of its duration.	Not cumulatively considerable	**APM NOI-2:** Construction Equipment Working Order **APM NOI-3:** Construction Equipment Maintenance **APM NOI-4:** Construction Equipment Muffled **APM NOI-5:** Construction Equipment Idling Minimized **APM NOI-6:** Hearing Protection for Workers	**MM NOI-1:** Conduct Construction Activities during Daytime Hours **MM NOI-2:** Relocate Stationary Construction Equipment **MM NOI-3:** Turn off Idling Equipment **MM NOI-4:** Notify Adjacent Residences **MM NOI-5:** Install Acoustic Barriers	**Construction:** Temporary, minor, and localized adverse impacts at residences located at the Desert Oasis Apartment Complex due to project construction. **O&M:** No impact. Corona noise would be barely audible and would not change current conditions. Negligible adverse noise impacts due to maintenance activities.
3.11 Public Services and Utilities							
IMPACT PUSVC-1: Emergency services needed in response to an accident or other emergency incident associated with the proposed project	Although demand for emergency services may increase temporarily during construction, existing emergency service providers and facilities would be sufficient to handle any incidents that may occur. The applicant would implement APM HAZ-4, APMTRA-2, APM TRA-3, APM PUSVC-1, and APM PUSVC-2, which would help ensure that emergency response services would not be affected. To further mitigate impacts MM HAZ-1 requires the applicant to prepare a Health and Safety Plan and conduct a worker safety and environmental training program.	Less than significant without mitigation	Concurrent construction of multiple reasonably foreseeable future construction projects, such as ISEGS and DesertXpress, could increase demands on emergency services, but each project would likely take steps to minimize its demand on these services. Therefore, concurrent construction of multiple projects would not likely create a significant cumulative impact on emergency services, and there would not be a considerable cumulative impact.	Not cumulatively considerable	**APM HAZ-4:** Fire Management Plan **APM TRA-2:** Traffic Management and Control Plans **APM TRA-3:** Minimize Street Use **APM PUSVC-1:** Work Around High Pressure Pipelines **APM PUSVC-2:** Monitoring by Pipeline Companies	**MM HAZ-1:** Worker Health and Safety and Environmental Training and Monitoring Program **MM PUSVC-2:** Notification of Utility Service Interruption	**Construction:** **Emergency Services:** Short term and negligible adverse impacts **Hazardous Waste:** Short term and negligible adverse impacts **Wastewater:** Short term and negligible adverse impacts **Water Usage:** Negligible, localized, and short term adverse **Operation:** Emergency response needs are expected to be similar to existing needs in the project area, and the applicant has included a number of security design features to ensure negligible impacts on police services

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
							due to the new Ivanpah Substation.
IMPACT PUSVC-2: Project construction temporarily increases water use, and project operation contributes to increased long-term water consumption	The applicant has estimated that between 30.6 and 38.3 acre feet per annum would be needed for the construction phase of the transmission line. Because there is a limited water supply in the proposed project area, the applicant would implement MM W-2 (Water Use Maximum) to sets maximum water use limits for the construction and operation phases. For more information on water use and consumption, specifically as it relates to the potential for lowering the water table in the project area, see Impact HYDRO-2	Less than significant with mitigation	Given that multiple reasonably foreseeable future construction projects in the area could occur concurrently with the EITP and ISEGS, there could be a cumulatively significant impact on local water use, depending on the water sources. However, because the EITP has determined their water source and would be implementing MM W-2, the EITP contribution to the cumulative impact would not be significant.	Cumulatively considerable	N/A	**MM W-2:** Water Use Maximum	**Construction:** **Emergency Services:** Short term and negligible adverse impacts **Hazardous Waste:** Short term and negligible adverse impacts **Wastewater:** Short term and negligible adverse impacts **Water Usage:** Negligible, localized, and short term **Operation:** Emergency response needs are expected to be similar to existing needs in the project area, and the applicant has included a number of security design features to ensure negligible impacts on police services due to the new Ivanpah Substation.
IMPACT PUSVC-3: Solid waste generated during construction of the project exceeds landfill requirements	Approximately 26% (140 tons) of the total construction waste would be would be disposed in landfills. Existing solid waste facilities have adequate capacity to accommodate project-related solid wastes. With the implementation of MM PUSVC-1, potential impacts on landfills would be less than significant.	Less than significant with mitigation	All of the reasonably foreseeable future projects would contribute solid waste to landfills in either California or Nevada. The total solid waste from each project that goes to a landfill would be reduced. There would not be a significant cumulative impact on the capacity of local landfills as long as all of the projects adhered to local policies and regulations related to recycling.	Not cumulatively considerable	N/A	**MM PUSVC-1:** Construction Waste Disposal Plan	**Construction:** **Emergency Services:** Short term and negligible adverse impacts **Hazardous Waste:** Short term and negligible adverse impacts **Wastewater:** Short term and negligible adverse impacts **Water Usage:** Negligible, localized, and short term adverse **Operation:** Emergency response needs are expected to be similar to existing needs in the project area, and the applicant has included a number of security design features to ensure negligible impacts on police services due to the new Ivanpah Substation.
IMPACT PUSVC-4: Solid waste generated during construction of the project results in noncompliance with federal, state, or local statutes, regulations, or policies	Implementation of MM PUSVC-1 would ensure compliance with local policies regarding solid waste management, impacts.	Less than significant with mitigation	There would not be a significant cumulative impact on the capacity of local landfills as long as all of the projects adhered to local policies and regulations related to recycling.	Not cumulatively considerable	N/A	**MM PUSVC-1:** Construction Waste Disposal Plan	**Construction:** **Emergency Services:** Short term and negligible adverse impacts **Hazardous Waste:** Short term and negligible adverse impacts **Wastewater:** Short term and negligible adverse impacts **Water Usage:** Negligible, locatlized,

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
							and short term adverse **Operation:** Emergency response needs are expected to be similar to existing needs in the project area, and the applicant has included a number of security design features to ensure negligible impacts on police services due to the new Ivanpah Substation.
3.12 Recreation							
IMPACT REC-1: Disruption of Access to Existing Recreation Opportunities	Construction of the transmission line would temporarily restrict access to several trail segments in the Jean/Roach Dry Lake Recreation Area. With implementation of APM REC-1, recreational facility closures would be coordinated with facility owners and construction would be scheduled to avoid heavy recreational use periods. Additionally, implementation of MM REC-1 would require the applicant to locate extra workspace areas outside of Recreation Areas, limiting construction activities to the construction ROW.	Less than significant with mitigation	If the EITP and other foreseeable projects in the area had overlapping construction schedules, there could be a considerable short-term cumulative impact to the Jean/Roach Lake SRMA because each would temporarily restrict access to trails. Based on the duration of construction in the Jean/Roach Lake SRMA, EITP would have a minor short-term contribution or less than significant with mitigation to cumulative impacts to recreation in the Jean/Roach Lake SRMA.	Cumulatively considerable	**APM REC-1:** Recreation Area Closures	**MM REC-1:** Limit Construction Workspace in Wildlife and Recreational Areas **MM REC-2:** Notify the Nevada Department of Wildlife of Any Road Closures During Hunting Season	**Construction:** minor, short term, localized, and negligible impacts from construction activities. **O&M:** No impact.
Clarification of roads available for OHV usage (NEPA Only Impact).	MM REC-3 would ensure that project spur roads not open for OHV use are clearly marked	N/A	There would not be a significant cumulative impact to recreation.	Not cumulatively considerable	N/A	**MM REC-3:** Display Appropriate "Closed" Signage for New Spur and Access Roads Constructed.	Negligible, localized impacts on recreation
Cumulative Impact REC-C-1: Restricting Access to Areas within the Jean/Roach Dry Lake SRMA	The EITP would cross the Jean/Roach Dry Lake SRMA between MP 7 and MP 28.5. Construction of the transmission line would temporarily restrict access to several trail segments. As part of the project (APM REC-1), the applicant would coordinate closures of recreational facilities with the facility owners and would schedule construction to avoid heavy use periods. MM REC-1 requires the applicant to locate extra workspace areas outside of the Ivanpah Dry Lake Recreation Area and Jean/Roach Dry Lake SRMA, which would further minimize the temporary disturbance on recreation in the vicinity of the dry lakes.	Less than significant with mitigation	The Nextlight Silver State Solar Project would be located entirely within the boundary of the Jean/Roach Dry Lake SRMA and would be constructed on two sections of a competitive OHV racing trail. If the EITP and NextLight Silver State Solar Project had overlapping construction schedules, there could be a considerable short-term cumulative impact to the Jean/Roach Dry Lake SRMA because each would temporarily restrict access to trails. Based on the assumption that there would be overlapping construction schedules and the duration of construction in the Jean/Roach Dry Lake SRMA and the area of the Jean/Roach Dry Lake SRMA crossed by the EITP, the project would have a minor short-term contribution or less than significant contribution with mitigation to cumulative impacts on recreation in the Jean/Roach Dry Lake SRMA.	Cumulatively Considerable	**APM REC-1:** Recreation Area Closures	**MM REC-1:** Limit Construction Workspace in Wildlife and Recreational Areas	Minor short-term adverse

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
3.13 Socioeconomics, Population and Housing, and Environmental Justice							
No Impact	Construction of the EITP would cause a negligible increase compared with the size of the regional population, and no impact would result. Permanent employees required for operation and maintenance activities would be similar to current levels of staffing for the existing line. Project construction, operations and maintenance would not substantially increase the demand for housing or directly or indirectly induce population growth in the area. Similarly, project activities would not displace existing housing or people, or necessitate relocation or the construction of replacement housing elsewhere.	No Impact	Concurrent construction of the reasonably foreseeable future projects would result in a beneficial cumulative impact on the local and regional economy and tourism, and could decrease unemployment during periods of construction. Reasonably foreseeable future projects, in conjunction with the EITP, would result in cumulative impacts to air, noise, public services, and traffic that may effect low-income populations in Primm, Nevada. However, these impacts would not disproportionately affect these communities, and therefore would not result in a cumulative environmental justice impact.	Not cumulatively considerable	N/A		**Construction:** negligible, short-term, beneficial impact on the region's economy, area incomes, and the region's labor force. **O&M:** negligible impacts on labor, minority and low-income populations, and the tourism industry.
3.14 Traffic and Transportation							
IMPACT TRANS-1: Traffic Load and Capacity	Less than significant impacts on existing traffic load and capacity, as a limited number of vehicles over a short period would be used for construction. Implementation of APM TRA-1 and APM TRA-2 would contribute to reduction of impacts associated with construction traffic. Impacts on northbound I-15 during the Friday afternoon commute would be short term and less than significant. Use of helicopters of during construction and operations could also increase the volume of air traffic in the area and potential air traffic conflicts could occur. Potential air traffic conflicts would be reduced to less than significant levels with implementation of MM TRANS-2. Additionally, MM HAZ-2, which requires compliance with all FAA requirements upon construction of the SNSA, would further reduce air traffic conflicts to less than significant.	Less than significant with mitigation	The contribution of the proposed project's impact to traffic and transportation would be minor. However, the proposed project's incremental effect could result in a considerable cumulative impact. The exact number of vehicles to be added by the EITP and other foreseeable during concurrent construction cannot be determined with the available information. The proposed project would contribute a maximum of 200 vehicles over an 18-month period and would minimize impacts through use of a Traffic Management Plan.	Cumulatively considerable	**APM TRA-2:** Traffic Management and Control Plans	N/A	**Construction:** Direct minor adverse traffic impacts due to project construction access along I 15 and SR 164/Nipton Road. Impacts would be localized at construction yards and crossing points (MP 29) along the transmission line route and would be short term. **O&M:** No impact. Maintenance activities associated with substations and transmission lines would not require additional vehicles beyond those used for current operations and maintenance procedures
IMPACT TRANS-2: Impact Level of Service Standard and Lane Closures	Less than significant impacts on existing Level of Service (LOS) standards as defined by Caltrans. A limited number of vehicles over a short period would be used for construction. Impacts on northbound I-15 during the Friday afternoon peak hours due to increased number of vehicles on the road would be short term and less than significant. Implementation of APMs TRA-1, TRA-2, and TRA-3 would contribute to reduction of impacts associated with construction traffic. The severity of the short-term impact would depend on the number of lanes closed, the duration of the closure, and the LOS conditions at the time of closure. MM TRANS-1 will limit construction activities so as not to require lane closures on peak usage hours. MM TRANS-3 will ensure that a Traffic Control Plan is developed to address staggering of project deliveries on I-15 during peak traffic times.	Less than significant with mitigation	The contribution of the proposed project's impact to traffic and transportation would be minor. However, the proposed project's incremental effect could result in a considerable cumulative impact. With concurrent construction of the projects mentioned above the number of vehicles using I-15 would increase and would adversely impact traffic load and LOS on I-15 principally on Fridays from noon to 10 p.m. However, the exact number of vehicles to be added cannot be determined with the available information.	Cumulatively considerable	**APM TRA-1:** Obtain Permits **APM TRA-2:** Traffic Management and Control Plans **APM TRA-3:** Minimize Street Use	**MM TRANS-1:** No Lane Closures on I-15 during Friday Peak Usage **MM TRANS-3:** Traffic Control Plan.	**Construction:** Direct minor adverse traffic impacts due to project construction access along I 15 and SR 164/Nipton Road. Impacts would be localized at construction yards and crossing points (MP 29) along the transmission line route and would be short term. **O&M:** No impact. Maintenance activities associated with substations and transmission lines would not require additional vehicles beyond those used for current operations and maintenance procedures

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
IMPACT TRANS-3: Impact Emergency Access	Emergency response providers near the proposed project area would be notified in advance about the exact location of construction, road or route closure schedules, and location of potential alternate routes, as needed. Implementation of APMs TRA-1, TRA-2, and TRA-3 would contribute to reduction of impacts associated with emergency access. Work would be coordinated with local police and traffic engineers to plan appropriate access alternatives for temporary street closures and traffic disruption, if closures were required.	Less than significant without mitigation	Emergency response providers near the proposed project area and those for other construction projects would be notified in advance about the exact location of construction and road or route closure schedules. Like the proposed project, the foreseeable projects would coordinate with local police and traffic engineers to plan appropriate access alternatives for temporary street closures and traffic disruption, if closures were required.	Not cumulatively considerable	N/A	N/A	**Construction:** Direct minor adverse traffic impacts due to project construction access along I 15 and SR 164/Nipton Road. Impacts would be localized at construction yards and crossing points (MP 29) along the transmission line route and would be short term. **O&M:** No impact. Maintenance activities associated with substations and transmission lines would not require additional vehicles beyond those used for current operations and maintenance procedures
IMPACT TRANS-4: Result in a Change in Air Traffic Patterns	While the proposed project would not impact existing air traffic, use of helicopters of during operation and maintenance procedures could interfere with air traffic associated with the future SNSA. As a result, the applicant is required to implement MM TRANS-2, which requires coordination with the FAA regarding a Helicopter Flight Plan and Safety Plan. In addition, MM TRANS-2 specifies that the applicant will review the plan with the FAA and the CCDOA at least 30 days prior to the start of SNSA construction. With the implementation of MM TRANS-2, potential air traffic conflicts would be reduced to less than significant levels.	Less than significant with mitigation	Use of helicopters of during operations and maintenance procedures could interfere with air traffic associated with the future SNSA. As a result, the applicant is required to implement MM TRANS-2, which requires coordination with the FAA regarding a Helicopter Flight Plan and Safety Plan. Additionally, helicopter use during maintenance procedures is common for linear projects. Calnev Pipeline requires helicopter use and other existing transmission lines may also use helicopters in the cumulative impact area. If the SNSA is constructed, use of helicopters during operations could contribute to a cumulative impact; however, given the infrequency that helicopters would be used for the EITP, the EITP's contribution to this impact would be negligible.	Not cumulatively considerable.	N/A	**MM Trans-2:** Helicopter Flight Plan and Safety Plan	**Construction:** No Impact. There would be no impact on existing air traffic **O&M:** Direct, minor, adverse and Localized. Helicopter usage associated with operation and maintenance of the transmission line could interfere with air traffic associated with the proposed Southern Nevada Supplemental Airport.

Table ES-5 EITP Direct, Indirect, and Cumulative Effects and Mitigation Measures

Type of Impact	Summary of Impact	CEQA Significance of Impact	Potential Cumulative Impact	Cumulative Significance	Applicant Proposed Measures	Mitigation Measures	NEPA Summary
Cumulative Impact TRANS-C-1: Traffic Load, Capacity, and Level of Service	Most roads in the cumulative impact area are infrequently used and would not be adversely affected by a slight, temporary increase in road traffic; however, construction of the EITP would increase use of I-15 by a maximum of 200 vehicles. Northbound I-15 experiences periods of heavy use on Friday from approximately noon to 10 p.m. because of motorists traveling between the Las Vegas and Los Angeles areas. The applicant would acquire encroachment permits (APM TRA-1) and implement a Traffic Management and Control Plan (APM TRA-2) to reduce impacts. The EITP, ISEGS, the First Solar Project, the NextLight Silver State Solar Project, the Calnev Pipeline Expansion Project, and the DesertXpress High-Speed Rail Project would be located near the I-15 corridor. It is likely that during certain periods, construction of these projects could have overlapping schedules (see Table 5-3). Relevant impacts of the EITP are IMPACT TRANS-1: Traffic Load and Capacity and IMPACT TRANS-2: Level of Service Standard and Lane Closures.	Less than significant wih mitgation	With concurrent construction of the projects mentioned above, the number of vehicles using I-15 would increase and would adversely impact traffic load and LOS on I-15 principally on Fridays from noon to 10 p.m. However, the exact number of vehicles to be added cannot be determined with the available information. The EITP would contribute a maximum of 200 vehicles over an 18-month period and would minimize impacts through use of a Traffic Management Plan; therefore, the contribution of the EITP's impact on traffic and transportation would be minor. However, the EITP's incremental effect could result in a considerable cumulative impact; therefore, mitigation would be necessary.	Cumulatively considerable	**APM TRA-1:** Obtain Permits **APM TRA-2:** Traffic Management and Control Plans	**MM-C-TRANS-1:** I-15 Use Limits.	Minor, short-term cumulative impact.

Key:
APM = Applicant Proposed Measure
BLM = Bureau of Land Management
CARB = California Air Resources Board
CO = Carbon monoxide
CO_2e = Carbon dioxide equivalent
EITP = Eldorado–Ivanpah Transmission Project
ESA = Environmental Site Assessment
GHG = Greenhouse gas
KOP = Key observation point
LOS = Level of Service (quantifies the congestion level on a particular roadway or intersection)
MDAQMD = Mojave Desert Air Quality Management District
MM = Mitigation measure
N/A = Not available
NEPA = National Environmental Policy Act
NO_X = Nitrogen Oxides
O&M = Operation and Maintenance
PM_{10} = Particulate Matter
$PM_{2.5}$ = Fine Particulate Matter (2.5 micrometers in diameter and smaller)
ROW = Right-of-way
SFS = Stateline Fault System
SIP = State Implementation Plan (relative to air criteria pollutants)
SNSA = Southern Nevada Supplemental Airport
VdB = Vibration decibel
VOC = Volatile organic compound
VRI = Visual Resource Inventory
VRM = Visual Resource Management Class (VRM Class II objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low)
WEAP = Worker Environmental Awareness Program

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1. Introduction

On May 28, 2009, Southern California Edison (SCE, or the applicant) submitted an application (A.09-05-027) to the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (CPCN) to construct and operate the Eldorado–Ivanpah Transmission Project (EITP, or the proposed project). Because the project would be located primarily on lands managed by the U.S. Department of the Interior (DOI) Bureau of Land Management (BLM), the applicant also filed a right-of-way (ROW) application with the BLM for a grant pursuant to Title V of the Federal Land Policy and Management Act.

In compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act of 1969 (NEPA), as amended, the CPUC and the BLM ~~have prepared this~~prepared a Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) to provide to both agencies' decision-makers and the public detailed information about the environmental impacts of the project, reasonable alternatives to the project, and ways to mitigate or avoid the project's adverse environmental impacts. The CPUC determined that an EIR would be required under CEQA due to anticipated significant impacts; the BLM determined that an EIS would be an appropriate level of analysis since it was not able to determine without additional evaluation whether the environmental impacts would be significant under NEPA. The Draft EIR/EIS was published with the California State Clearinghouse on April 30, 2010 and in the Federal Register on May 7, 2010. A public comment period followed and ended on June 26, 2010; public comments on the Draft EIR/EIS are included in Appendix G. This Final EIR/EIS includes responses to comments on the Draft EIR/EIS, additional information (e.g., survey results received after publication of the Draft EIR/EIS), and updated information (e.g., updates to plans or regulations that were changed after the publication of the Draft EIR/EIS).

This EIR/EIS describes and evaluates the environmental impacts that are expected to result from construction and operation of the applicant's proposed EITP, and presents recommended mitigation measures that, if adopted, would avoid or minimize many of the significant environmental impacts identified. In accordance with CEQA and NEPA requirements, this EIR/EIS also identifies alternatives to the proposed project (including the No Project Alternative) that could avoid or minimize significant or adverse environmental impacts associated with the project as proposed by the applicant and evaluates the environmental impacts associated with these alternatives. Specifically, the information contained in this EIR/EIS will be considered by the BLM and the CPUC in their respective deliberations on potential approval of the ROW grant and the CPCN. This EIR/EIS may also be considered by other applicable permitting agencies.

1.1 Overview of the Core Proposed Project, Alternatives, and the Whole of the Action / Cumulative Action

1.1.1 The Core Proposed Project Evaluated Under CEQA/NEPA

This section presents an overview of the project, as proposed by the applicant, and all alternatives considered in this EIR/EIS, including the No Project Alternative. The core project includes the transmission upgrades and associated transmission infrastructure and the alternatives included in the application submitted by SCE to the CPUC and the BLM. This document also includes information on related projects, or "the whole of the action / cumulative action," as described below in Section 1.1.2. A complete description of the project and its alternatives is given in Chapter 2. Figure 1-1 depicts the proposed project and its alternatives. The proposed project would include the following components:

- **Powerlines**
  - **Eldorado–Ivanpah Transmission Line**

  - **Subtransmission Line**
  - **Distribution Line**
- **Substations**
  - **New Ivanpah Substation**
  - **Eldorado Substation Upgrades**
- **Telecommunication System**

Alternatives to the proposed project were developed in accordance with CEQA and NEPA requirements. Before filing the application, the applicant consulted with both the CPUC and the BLM through a pre-filing process, and a number of alternatives were developed at that time. Additionally, the CPUC and the BLM performed an independent and thorough review of all the information submitted with the application to develop an exhaustive list of reasonable alternatives and alternatives that would reduce one or more significant or adverse impacts. This process included a review of surveys, studies, and applicable planning documents for the region and a meeting with the California Independent System Operator (CAISO) on September 28, 2009, to discuss reliability standards and transmission system planning.

Alternatives to the proposed project include transmission line routing alternatives and telecommunications alternatives, as depicted in Figure 1-1. A number of additional alternatives were considered early in the environmental review process but were eliminated from further consideration based on a preliminary analysis of both system alternatives and technology alternatives. Alternatives carried forward are considered in an equivalent level of detail and with an equivalent level of analysis.

In addition to the proposed project, as described above, the alternatives carried forward for analysis in this document include the following:

- **Parallel to Los Angeles Department of Water and Power (LADWP) Corridor Alternative (Transmission Alternative A)**
- **North of Eldorado Alternative (Transmission Alternative B)**
- **North Dry Lakes Reroute Alternative (Transmission Alternative C)**
- **South Dry Lakes Reroute Alternative (Transmission Alternative D)**
- **South Dry Lakes Bypass Alternative (Transmission Subalternative E)**
- **Golf Course Telecommunication Alternative**
- **Mountain Pass Telecommunication Alternative**

Other alternatives were considered but eliminated from further consideration based on a preliminary analysis of potential environmental impacts, feasibility, and ability to meet the basic project objectives or purpose and need outlined below in Section 1.2.4. These alternatives and the rationale for their elimination are discussed in detail in Appendix A-1, Alternatives Screening Report.

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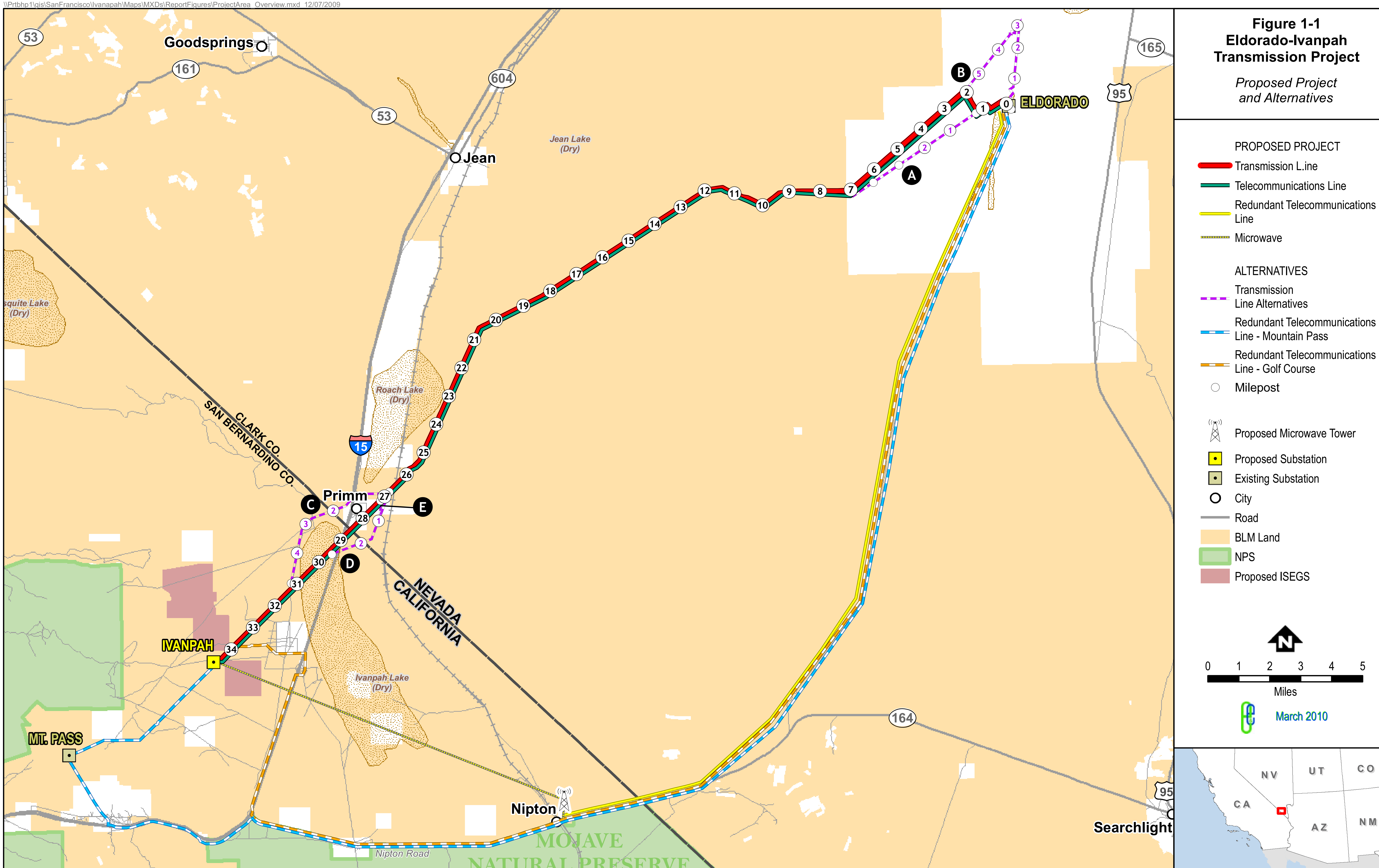

Figure 1-1
Eldorado-Ivanpah Transmission Project
Proposed Project and Alternatives

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1.1.2 Additional Projects Considered in this EIR/EIS

Under both CEQA and NEPA, the lead agency must assess all environmental impacts that would occur as a result of the proposed project or action; both CEQA and NEPA stipulate that this assessment is not limited only to the project components as defined in a single permit application. As described below in Section 1.2, the EITP would facilitate the interconnection of renewable generation sources into the California grid in compliance with California's Renewables Portfolio Standard (RPS). In the interest of full disclosure and to allow agency decision-makers to reach an informed decision on whether to permit the EITP, information on the environmental effects of related renewable generation projects is included in this document.

However, because many of the renewable generation projects in the Ivanpah Valley Area are being developed, applied for, and analyzed under CEQA and/or NEPA concurrently with the proposed EITP, their status and the level of publicly available information varies. Additionally, because the Ivanpah and Eldorado valleys are crossed by numerous transmission lines as well as transmission corridors, renewable energy generation projects in the vicinity of the proposed EITP could conceivably connect with a number of different transmission lines. For this reason, the level of detail and the consideration under CEQA and NEPA varies in this document.

The Ivanpah Solar Electric Generating System (ISEGS) project is discussed in Chapters 2 and 3 of this document as part of the "whole of the action" under CEQA and as a "cumulative action" under NEPA. The ISEGS project is discussed because of geographical proximity and the current overlapping schedules of the ISEGS project and EITP, and because of contractual terms within signed agreements between the applicant and BrightSource Energy, Inc. (BrightSource) the solar developer for ISEGS~~,~~ and the EITP applicant and another electric service provider, which states that the ISEGS project would connect to the EITP. Background information on CEQA and NEPA requirements and on the CPUC and BLM determination that ISEGS constitutes part of the "whole of the action" and a "cumulative action," respectively, is provided below.

Other renewable generation projects planned in the Ivanpah Valley Area may connect to the EITP as well, including the projects listed in Table 1-1. Unlike the ISEGS project, these projects are not considered part of the whole of the action under CEQA or as a cumulative action under NEPA due to their speculative nature at the time of the Draft EIR/EIS development date of December 31, 2009, as evidenced by the lack of publicly available information on their environmental ~~effects~~design or initiation of an environmental review process~~,~~ and/or the lack of a signed Power Purchase Agreement (PPA) as of December 31, 2009 with any electric service provider to connect to the EITP ~~as of December 31, 2009~~. These projects are instead discussed in Chapter 5: Cumulative Scenario and Impacts.

Table 1-1 Ivanpah Dry Lake Area New Generation Interconnection Requests

CAISO Queue Position	Type	Size (MW)	Area of Interconnection[1]
~~CAISO Queue #126~~	~~Wind~~	~~1,500~~	~~Eldorado Substation~~
CAISO Queue #131	Solar-Thermal	114	New Ivanpah Substation 115-kV
CAISO Queue #162	Solar-Thermal	100	New Ivanpah Substation 115-kV
CAISO Queue #233	Solar Thermal	200	Ivanpah Substation 230-kV
Total Continuing Under LGIP Serial Approach		**~~1,700~~ 414**	
CAISO Queue #163	Solar Photovoltaic	300	Ivanpah Substation 230-kV
~~CAISO Queue #205~~	~~Solar Thermal~~	~~300~~	~~Eldorado 220-kV Switchyard~~
CAISO Queue #467	Solar Thermal	230	Eldorado–Ivanpah 230-kV Line
~~CAISO Queue #488~~	~~Solar Thermal~~	~~92~~	~~Eldorado Substation 230-kV~~
~~CAISO Queue #497~~	~~Solar Thermal~~	~~6~~	~~New Ivanpah Substation 115-kV~~
~~CAISO Queue #498~~	~~Solar Thermal~~	~~20~~	~~New Ivanpah Substation 115-kV~~
~~CAISO Queue #499~~	~~Solar Thermal~~	~~40~~	~~New Ivanpah Substation 115-kV~~

Table 1-1 Ivanpah Dry Lake Area New Generation Interconnection Requests

CAISO Queue Position	Type	Size (MW)	Area of Interconnection[1]
~~CAISO Queue #500~~	~~Solar Thermal~~	~~960~~	~~Eldorado Substation 500-kV~~
~~CAISO Queue #502~~	~~Solar Photovoltaic~~	~~270~~	~~Eldorado–Ivanpah 230-kV Line~~
~~CAISO Queue #503~~	~~Solar Photovoltaic~~	~~500~~	~~Eldorado–Ivanpah 230-kV Bus~~
Total Continuing Under Transitional Queue Cluster Approach		**~~2,418~~ 530**	
CAISO Queue #488	Solar-Photovoltaic	92	Eldorado Substation 230-kV
CAISO Queue #502	Solar-Photovoltaic	20	Eldorado–Ivanpah 230-kV Line
CAISO Queue #503	Solar-Photovoltaic	150	Eldorado–Ivanpah 230-kV Bus
Total Continuing Under New Queue Cluster Approach		**267**	
Grand Total Interconnection Requests		**~~4,118~~ 1,211**	

Source: CAISO 2010. Interconnection Queue as of October 29, 2010.
Notes:
[1]Area of interconnection is identified by the developer as part of the interconnection request. Inconsistencies in naming conventions for substations and transmission lines reflect differences in naming conventions between developers.
Key:
CAISO = California Independent System Operator
kV = kilovolt
MW = megawatt

1.1.2.1 CEQA Whole of the Action

Under CEQA, a "project" is defined as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment" (CEQA Guidelines 15378(a)). The CEQA Guidelines also state that the "project" may require several discretionary approvals by governmental agencies and that each separate governmental approval does not necessarily constitute a separate project (CEQA Guidelines 15378(c)).

As discussed below in Section 1.2, the objective for the proposed project is to connect renewable generation sources in the Ivanpah Valley region to the existing electrical transmission grid and to enable SCE to comply with California's RPS. In the vicinity of the proposed Ivanpah substation ~~there are three phases of one renewable generation project, all part of the ISEGS, under review~~ the ISEGS project has been reviewed and approved by the BLM and the California Energy Commission (CEC) under Docket 07-AFC-05. The ISEGS applicant, BrightSource, has executed PPAs with SCE and Pacific Gas and Electric (PG&E) to connect to the EITP. Based on the timing and language of the signed PPAs, and the published Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS), FSA Addendum, Errata to the FSA, CEC's Final Decision, Supplemental DEIS, Final EIS, and BLM's Record of Decision for the ISEGS project (CEC and BLM 2009, CEC 2010, CEC 2010a, CEC 2010b, BLM 2010a, and BLM 2010b) and the California Energy Commission (CEC) approval of the ISEGS project on August 22, 2010, the CPUC has determined that ISEGS constitutes a reasonably foreseeable physical change in the environment and should be analyzed for the EITP as part of the "whole of the action" under CEQA.

1.1.2.2 NEPA Cumulative Action

Under NEPA, related actions can be considered in an environmental document as "connected," "cumulative," or "similar" actions. NEPA regulation requires that the federal agency consider the proposed action and other "connected" or "cumulative" actions in the same EIS (40 CFR 1508.25). An agency may, but is not required to, consider other "similar" actions in the same environmental document.

"Connected" actions are closely related. Actions are connected if they (1) automatically trigger other actions that may require environmental impact statements, (2) cannot or will not proceed unless other actions are taken beforehand or simultaneously, or (3) are interdependent parts of a larger action and depend on the larger action for their justification. "Cumulative" actions have cumulatively significant impacts when viewed with other proposed actions. "Similar" actions have similarities, such as common timing or geography, with other reasonably foreseeable or proposed agency actions. These similarities provide a basis for evaluating the actions' environmental consequences together. An agency may analyze "similar" actions in the same EIS, and should do so when it is the best way to adequately assess the actions' combined impacts.

The BLM has determined that the ISEGS project constitutes a "cumulative" action for the EITP EIR/EIS. Reasons for declining to define ISEGS as a "connected" or "similar" action are given below, followed by reasons for defining ISEGS as a "cumulative" action.

The BLM has determined that the ISEGS project and the EITP are not "connected" actions because it is not the case that each depends on the other. While the ISEGS project at full build-out would depend on the EITP because the existing transmission line (without the EITP proposed line and substation upgrades) would provide insufficient transmission capacity for the power generated by all phases of the ISEGS project, the EITP would not depend on the ISEGS project. BLM has received a number of applications for additional power generation projects in both California and Nevada that could tie into the EITP, including those listed in Table 1-1, ~~below~~above. ~~Therefore, t~~Although the ISEGS project, which was approved by the CEC on September 22, 2010, would connect to the EITP, the EITP ~~is~~ was proposed in response to ~~needed for~~ planned renewable development in the Ivanpah Valley area ~~even if the ISEGS project is not constructed~~and was not proposed as a dedicated line for the ISGES project. Therefore, the ISEGS project is not considered a "connected action" to the EITP.

The BLM has also determined that the ISEGS project is not "similar" to the EITP, for several reasons. First, the EITP EIS addresses transmission and its effects, and the ISEGS EIS addresses power generation and its effects. Second, while the two projects would be close to each other geographically, the initial timing of applications and construction of the projects was not close enough to consider the applications in a joint document.[1] ~~Second, while the two projects would be close to each other geographically, their timing would not be the same (although it could overlap).~~ Third, at the time of the preparation of the Draft EIR/EIS for the EITP, the projects were in different phases of review.[2] ~~The ISEGS project~~ was~~is supported by an FSA/DEIS, prepared jointly by the CEC and the BLM~~. ~~For FSAs in general, the CEC prepares a CEQA equivalent document that involves taking staff testimony and public comments before ultimate decision-making by the CEC.~~ As of December 31, 2009, when the Draft EIR/EIS for the EITP was being

[1] During the environmental analyses, the schedule for the ISEGS review was delayed to develop complete environmental data for the analysis, and the schedule for the EITP environmental review was accelerated to facilitate renewable energy project considerations under the American Recover and Reinvestment Act (ARRA). Despite the fact that the application for the ISEGS project was submitted approximately 21 months before the application for the EITP, the environmental review and permitting of both the EITP and the ISEGS projects are now more likely to have overlapping construction periods due to differences in the pace of the environmental permitting and review process for each project.

[2] The ISEGS project was supported by an FSA/DEIS, prepared jointly by the CEC and the BLM. For FSAs in general, the CEC prepares a CEQA equivalent document that involves taking staff testimony and public comments before ultimate decision-making by the CEC. The CEC and the BLM have subsequently approved the project after publishing an FSA Addendum, an Errata to the Air Quality Section of the FSA Addendum, the CEC's Presiding Member's Proposed Decision, the BLM's FEIS, and the BLM's ROD.

prepared, the ISEGS FSA/DEIS had been published and the process of taking staff testimony and public comments had begun. In contrast, ~~no information had been published until~~the corresponding environmental review document for the EITP, the Draft EIR/EIS, was not published until ~~now~~ April 30, 2010. ~~for the EITP; this EIS is the first publicly available information on the environmental effects of the EITP.~~ Fourth, the EITP is under the jurisdiction of a separate and distinct state agency (the CPUC, as opposed to the CEC for the ISEGS project). Fifth, the BLM ~~will make~~ is making distinct federal ROW decisions for each of the projects; if issued, the EITP ROW grant~~s~~ will be to a separate applicant~~s~~ than the ISEGS applicant.

As stated above, under the circumstances presented, the BLM has determined that the ISEGS proposal qualifies as a "cumulative action" to the proposed EITP. The ISEGS ~~FSA/DEIS~~ environmental documentation indicates that the ISEGS project would result in significant or adverse impacts, and the CEC decision to approve the ISEGS projects includes overriding considerations for several significant environmental impacts. Given the proximity in location and the overlapping (yet delayed) schedules of the EITP and the ISEGS project, it is reasonable to assume that the EITP, when considered in combination with ISEGS, would contribute to cumulatively significant impacts. A "cumulative action" differs from a cumulative impact in that it is considered to be part of the scope of the action; pursuant to U.S. Council on Environmental Quality (CEQ) regulation (40 CFR 1508.25(a)(2)), the ISEGS project ~~will be~~ is therefore discussed as part of the action within this EIS. Based on the existence of specific contractual terms within ~~three~~ the signed PPA and the quantity and quality of information available as of December 31, 2009, on the ISEGS project, the CPUC and the BLM determined that ~~the EITP will~~ ISEGS would be discussed in this document as part of the Whole of the Action (pursuant to CEQA) and as a Cumulative Action (pursuant to NEPA). The CEC recently approved the ISEGS project on September 22, 2010, and the BLM's ROD was signed on October 7, 2010.

1.1.2.3 Incorporation by Reference of the ISEGS FSA/DEIS

CEQA Guidelines 15150(a) state that an EIR "may incorporate by reference all portions of another document which is a matter of public record and which is generally available to the public." Similarly, under NEPA, CEQ regulations (1502.21) direct agencies to incorporate material into an EIS by reference "when the effect will be to cut down on bulk without impeding agency and public review of the action." These CEQ regulations specify that "the incorporated material shall be cited in the statement and its content briefly described." Because ISEGS ~~is already undergoing~~ has recently concluded environmental review with the CEC and the BLM, this EIR/EIS will not reevaluate the environmental impacts of the ISEGS project. Rather, this EIR/EIS will summarize the findings of the ISEGS FSA/DEIS, FSA Addendum, Errata to the Air Quality Section of the FSA Addendum, the CEC's Presiding Member's Proposed Decision, the BLM's FEIS, and the BLM's ROD, as appropriate. However, in the interest of fully disclosing the environmental impacts of the "Whole of the Action / Cumulative Action," this document assesses not only the effects of the EITP but the effects of the EITP combined with the effects of the ISEGS project. Therefore, all the potential effects of the EITP, the ISEGS project, and the combined effects of the two projects will be disclosed; the public and the agencies will be informed, and the agencies will be assisted in making their decisions using the best information available.

A complete description of the ISEGS project components, location, and construction is included in the "Whole of the Action / Cumulative Action" subsection of Chapter 2, "Project Description." ~~This information reflects the original ISEGS project layout for which BrightSource applied; subsequent revisions included a reduced project footprint and layout alternative. This document takes the more conservative approach of including the larger project footprint in an effort to disclose the greatest possible environmental effects of the ISEGS project.~~ While the EITP Draft EIR/EIS included information on the original 4,073 acre layout proposed by BrightSource, this Final EIR/EIS contains information on the ISEGS Mitigated Ivanpah 3 Alternative. The ISEGS Final EIS included two additional alternatives including the Mitigated Ivanpah 3 Alternative and the Modified I-15 Alternative. The 3,472 acre Mitigated Ivanpah 3 Alternative was selected in the ISEGS Final EIS as the preferred alternative of BLM, and approved in the ROD on October 7, 2010, rather than the originally proposed ISEGS layout because it reduced project impacts to sensitive species. This reduced footprint alternative was also adopted by the CEC in their decision to approve the project on September 22, 2010 (BLM 2010 and CEC 2010). Information on the environmental setting (baseline), applicable regulations, and environmental impacts of ISEGS are discussed under the “Whole of the Action / Cumulative Action” subsection for each resource evaluated in Chapter 3, “Affected Environment / Environmental Impacts.” This information is also used in developing the combined EITP and ISEGS impact summaries at the end of each resource section.

1.2 Purpose, Need, and Objectives

This section discusses the purpose, need, and objectives of the proposed project as required for CEQA and NEPA documents to facilitate an analysis of reasonable alternatives. CEQA and the CEQA Guidelines require a clearly written statement of objectives to guide the lead agency in developing a reasonable range of alternatives and aid decision-makers in preparing findings or a statement of overriding considerations. CEQA specifies that the statement of objectives should include the underlying purpose of the project (Section ~~15126.6(a)~~5124(b)). NEPA guidance published by the CEQ states that the purpose and need “shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives, including the proposed action” (40 CFR §1502.13).

1.2.1 Applicant’s Objectives

~~Under Sections 210 and 212 of the Federal Power Act (16 United States Code [USC] § (i) and (k)) and Sections 3.2 and 5.7 of CAISO’s Tariff, the applicant is obligated to interconnect and integrate power generation facilities into its electric transmission system. This requirement includes renewable power in additional to traditional generation sources.~~

As stated by the applicant, the purpose of the proposed project is to interconnect and deliver up to 1,400 megawatts (MW) of solar energy that is expected to be developed at the Ivanpah Valley area. ~~The~~ SCE’s existing Eldorado substation and existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV regional transmission lines cannot accommodate the additional power that would be generated by the anticipated ~~solar~~ renewable projects in the Ivanpah Valley. The applicant has proposed to construct the EITP to connect planned renewable energy sources to the CAISO-controlled transmission grid. The CAISO plans and approves transmission interconnections and maintains an Interconnection Request Queue of generation projects that have requested access to the transmission grid. The EITP would also improve line reliability such that it would comply with North American Electric Reliability Corporation (NERC) standards.

The applicant identified the following additional objectives for the project in the Proponent’s Environmental Assessment (PEA):

1. Reliably interconnect new solar generation resources in the Ivanpah Valley area and help the applicant and other California utilities comply with California’s RPS in an expedited manner
2. Comply with all applicable reliability planning criteria required by NERC, the Western Electricity Coordinating Council (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 to minimize effects on previously undisturbed land and resources
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 project needs in a cost-effective and timely manner

Table 1-1 lists the planned solar and wind energy projects in the Ivanpah Valley area by position in the CAISO queue. Projects in the CAISO queue have requested to connect to the CAISO-controlled electric grid; for each of these projects, the CAISO conducts an interconnection study, which includes analyses of issues such as short circuit/fault duty, steady state (thermal and voltage), and stability (CAISO 2008). CAISO is transitioning to a new interconnection review and approval process. Interconnection requests filed prior to June 2, 2008, are processed according to the Large Generator Interconnection Procedures (LGIP) serial study process; interconnection requests filed after that date must be submitted during one of two annual Queue Cluster Windows. Table 1-1 includes projects under the traditional sequential process as well as projects included under the cluster queue process.

1.2.2 Background Information

As noted above, the purpose of the proposed EITP is to reliably interconnect new solar generation sources in the Ivanpah Valley area in compliance with California's RPS. To allow for a better understanding of the purpose and objectives of the EITP, the following discussion provides background information on the RPS and renewable generation development, SCE's obligation to provide transmission capacity for renewable energy sources, and needed improvements to SCE's transmission system.

California Renewables Portfolio Standard

Senate Bill 1078, passed in 2002, established the California RPS, which requires utilities such as the applicant to increase sales of electricity produced by renewable energy sources including solar facilities by a minimum of 1 percent per year, with a goal of 20 percent of total sales by the year 2017. However, the CPUC, the CEC, and the California Power Authority adopted the Energy Action Plan (EAP), which pledged that the agencies would meet an accelerated goal of 20 percent by the year 2010. As a result, the California Senate passed Senate Bill 107 to be consistent with the EAP, and accelerated the implementation of the RPS, requiring utilities to meet the goal of 20 percent renewable energy generation by 2010. Additionally, Governor Schwarzenegger signed Executive Order S-14-08 on November 17, 2008, which establishes a goal of 33% generation by renewable energy sources by 2020 for electric utilities in California. The Ivanpah Valley area has been identified as having high potential for solar resource development in the transmission and energy planning documents described below. The proposed project would allow the applicant to increase its percentage of renewable resources in its energy portfolio and aid the State of California in reaching the goals of the RPS.

~~Currently~~As stated in the CPUC's *ene able o tfolio tan a a te ly epo t a te*, CPUC jurisdictional load-serving entities, including SCE, obtain approximately ~~13.7~~15.4 percent of their delivered energy from renewable resources ["load" is electricity demand] (CPUC 2010). The CPUC has approved PPAs totaling over 7,000 MW, primarily new generation facilities in the CAISO interconnection queue. With the addition of 7,000 MW of renewable generation, CPUC jurisdictional entities would achieve the 20 percent RPS target (CAISO 2009).

> **Renewable Energy Transmission Initiative (RETI) Report:** The CPUC, the CEC, CAISO, and utility providers participated in a statewide planning effort, including a detailed scoping process, to identify necessary transmission corridors to allow California to meet the RPS goals. The resulting RETI establishes California Renewable Energy Zones (CREZs) and provides a conceptual transmission framework for agencies and utilities. These zones and conceptual transmission lines are assessed based on a combination of factors, including generation potential, permitting feasibility, interconnection points into the grid, and the cost of generation and transmission.
>
> The EITP would be located in the Mountain Pass CREZ and would upgrade a portion of the Mountain Pass line segment group, which the RETI Phase 2B Report states would provide access to renewable energy in the Mountain Pass CREZ and may improve the power transfer capability between Arizona/Nevada and California through its connection with WECC Path 46. The Phase 2B Report lists the Mountain Pass CREZ capacity as 958 MW (780 MW of solar thermal and 178 MW of wind energy); the capacity estimate considered only generation projects located in California. The Mountain Pass CREZ has an environmental

score of 3.6, substantially lower than the median environmental score (a lower environmental score indicates fewer or less severe environmental impacts) and an economic score higher than the median environmental score (RETI 2010).

California Transmission Planning Group Report: The California Transmission Planning Group (CTPG), which comprises transmission owners and operators, was convened by FERC to develop a statewide transmission plan to meet the California RPS goal of 33% by 2020. One objective of CTPG's Phase 3 report is to identify "high potential" and "medium potential" transmission upgrades that offer promise in supporting rapid and substantive progress towards the RPS and recommends that developers, regulatory authorities, and other agencies with permitting authority focus their attention on the "high potential" transmission upgrades. Both the proposed Ivanpah Substation and the proposed upgrade of the existing single-circuit 115-kV Eldorado-Mountain Pass transmission line to a double circuit 230-kV transmission line that would connect the proposed Ivanpah Substation are listed as "high potential" transmission upgrades (CTPG 2010).

California Independent System Operator (CAISO) Renewable Conceptual Transmission Plan: CAISO coordinates, controls, and operates the electric transmission system within California; as part of the CAISO transmission planning process, proposed transmission projects and upgrades are studied by the CAISO to determine need. A summary of these findings and listings of required transmission projects are included in the CAISO annual Transmission Planning Process (TPP) report. However, because the TPP reports typically focus on the need for a proposed project in terms of its ability to increase system reliability, CAISO published a separate 2010 Renewable Conceptual Transmission Plan based on Inputs from the RETI Process. The objective of this report is to develop a system of transmission upgrades and additions that would allow California to meet the RPS goals, using information on environmental and economic rankings from the RETI process with a focus on the commercial viability of each CREZ (CAISO 2009).

In modeling the conceptual transmission upgrades and additions, this report considered only enough capacity to meet the projected "net short" amount (see below) to achieve 33% by 2010; the Mountain Pass CREZ and the EITP were included in this modeling exercise. The results stated that 1,200 MW of solar resources could be delivered to the grid from the Mountain Pass CREZ, accommodating 3,084 GWh/year toward the RPS goal. At the time of the report publication, there were 2,913 MW in the interconnection queue with 300 MW under a PPA (CAISO 2009).

Information from the Renewable Conceptual Transmission Plan will be incorporated in the CAISO 2010/2011 TPP report; the CAISO has also indicated that it will incorporate information from the CTPG Phase 3 Report in the 2010/11 TPP (CTPG 2010).

CAISO 2011 ISO Transmission Plan Renewable Base Case Assumptions. CAISO updated the modeling of generation projects and transmission upgrades with new information on proposed generation projects and network upgrades. Generation profiles were based on the RETI report, and assumptions were consistent with the CTPG report. EITP is listed as one of the major transmission upgrades included in the model (CAISO 2010).

CAISO Study of Operational Requirements and Market Impacts at 33% RPS. The California ISO is in the process of preparing a study to identify operational requirements and generation options to meet the 33% RPS in 2020 while maintaining system reliability and to inform the planning efforts of CAISO, CPUC and other state agencies to meet the 33% RPS. The study will examine a variety of renewable portfolios including a 20% Reference Case; a number of 33% renewable energy cases including a Reference Case, High Out-of-State Case, High Distributed Generation Case, and a Low Load Case, and an Alternative Case (27.5%). CAISO has published its proposed methodology, assumptions, and partial simulation results for the report although the study is currently ongoing.

California Public Utilities Commission (CPUC). 2009. 33% RPS Implementation Analysis Preliminary Results. June, 2009. In June of 2009 the CPUC published the preliminary results of an implementation analysis to meet the 33% by 2020 RPS; the CPUC has stated that a final version of the analysis will not be published. The CPUC assessed four unique 33% RPS cases, including a 33% Reference Case which emphasized utility scale solar thermal and solar PV projects already contracted or short-listed with the investor-owned utilities, a High Wind Case, a High Out-of-State Delivered Case and a High Distributed Generation Case.

The assessment of the Reference Case concluded that this case, which emphasized utility scale solar thermal and solar PV projects already contracted or short-listed with the investor-owned utilities, was most likely to miss the 2020 target timeline due to reliance on unproven technologies and the requirements for transmission. The High Wind Case was determined to be cost effective, but also likely to miss the 2020 timeline. The High Out-of-State Case was determined to be slightly more cost effective than the High Wind Case, but risky due to reliance on multi-state transmission. In the CPUC's assessment of a high distributed generation strategy, the report concludes that significant factors remain outside of CPUC control, among them "willingness of building owners to rent their rooftops, impacts on grid reliability, effectiveness of utility programs and other delivery channels, and whether both manufacturing capacity and a trained workforce will be available to meet this large increased demand."

All four cases were determined to be risky in terms of meeting the 2020 RPS goal. The report recommends mitigation strategies if achieving a 33% RPS by the year 2020 is determined to be the most important policy priority (as opposed to other priorities such as cost or creating jobs within California). The report states, "In order to mitigate the risk that one resource zone would fail to develop, thereby delaying the achievement of a 33% RPS by several years, the state should consider a procurement strategy that adequately considers the time and risk, in addition to price, associated with particular renewable generation resources." One of the strategies proposed includes, "planning for more transmission and generation than needed to reach just 33%" (CPUC 2009).

Renewable Distributed Energy Collaborative. In December of 2009, the CPUC along with other stakeholders kicked off the Renewable Distributed Energy Collaborative (Re-DEC) to examine issues facing renewable generation and explore solutions to those problems. Challenges to integrating distributed generation into the grid were identified during a December, 2009, meeting and a Re-DEC work plan is scheduled to be published by the CPUC in the 3rd quarter of 2010. Additionally, a Re-DEC timeline that identifies the barriers to meeting the 33% RPS through distributed generation is being constructed and will be used as an input for the CPUC's Long-term Procurement Plans (LTPP).

~~California Integrated Energy Policy Report~~

~~According to the CEC 2008 Integrated Energy Policy Report (IEPR) Update, the Consortium for Electric Reliability Technology Solutions/Electric Power Group (CERTS/EPG) presented the results of a study on transmission and operations issues related to renewable integration to the IEPR staff at a July 23, 2008, workshop. In their presentation, CERTS/EPG reported that California must integrate 20,000 MW of new renewable energy to meet the statewide 33 percent renewables target by 2020. By 2030, this amount would expand to 23,000 MW, since the overall demand for energy is expected to continue to grow (CEC 2008).~~

~~Renewable Energy Transmission Initiative Report~~

~~The Renewable Energy Transmission Initiative (RETI) report identifies a conceptual statewide transmission grid, as well as renewable energy zones both within and outside of California, with the goal of expediting development and approval of transmission infrastructure for renewable energy. The RETI report was prepared by a committee composed of the CPUC, the CEC, the CAISO, and publicly owned utilities (CPUC et al. 2009).~~

~~The report establishes and ranks California Renewable Energy Zones (CREZs) based on a combination of factors, including generation potential, permitting feasibility, interconnection points into the grid, and the cost of generation and transmission. Phase 2 of the report, published in September 2009, evaluates potential renewable energy generation from outside California, including Nevada (CPUC 2009). The EITP would be located in the Mountain Pass CREZ.~~

Executive Order 13212

Executive Order 13212, dated May 18, 2001, mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "production and transmission of energy in a safe and environmentally sound manner."

Energy Policy Act of 2005

The federal Energy Policy Act (EPAct) of 2005 requires the DOI~~, the BLM's parent agency,~~ to approve at least 10,000 MW of renewable energy on public lands by 2015; BLM is an agency under the DOI. Currently, proposed renewable energy projects amounting to 1,900 MW of electricity are on file with the BLM for the Ivanpah Valley area. Many of these are noted in Table 1-1. The EITP would allow for the transmission and distribution of energy from these renewable generation facilities. Based on the federal policies noted above, the BLM is obligated to consider the EITP proposal expeditiously to accommodate the potential increase in power generation that, if approved, would come on line after 2010.

Section 368 of the Energy Policy Act

Section 368 of the EPAct requires the DOI, in conjunction with the departments of agriculture (USDA), energy (DOE), commerce (DOC), and defense (DOD), to designate pipeline and electric transmission corridors for the 11 contiguous western states and establish procedures to expedite the review of projects that would be located within established energy corridors. Section 368 specifically notes the need for upgraded and expanded electric transmission infrastructure in the western United States to improve reliability, relieve congestion, and improve the capacity of nationwide electric transmission.

In response to Section 368 of the EPAct, the BLM and the DOE prepared the West-wide Energy Corridor Programmatic Environmental Impact Statement (WWEC PEIS) with the USDA, Forest Service, DOD, and the U.S. Fish and Wildlife Service (USFWS) participating as cooperating agencies (BLM and DOE 2009). The report establishes energy corridors on public lands in the western United States and serves as an amendment to existing management plans, including the California Desert Conservation Area (CDCA) Plan (BLM 1980) and the Las Vegas Resource Management Plan (RMP; BLM 1988). Corridors established by the WWEC PEIS were developed by federal agency staff and informed by the comments and suggestions of the public. The corridors met specific criteria, including location on federal lands, ability to establish connectivity with the energy grid, feasibility, legal and regulatory compliance, and compatibility with local BLM land use plans.

The Final WWEC PEIS reviewed a number of documents to establish the need for expansion of and improvements to the existing western electricity grid and to discuss the particular difficulties of reliably meeting the increasing electricity demands in the western United States. The WWEC PEIS cited the Western Governor's Association in recognizing that supply centers in the western United States are often located far from load centers (such as cities) and in discussing the difficulty of transmission planning when multiple agencies and/or states are involved. The difficulty of planning and permitting long-distance transmission was also discussed in the North American Electricity Reliability Corporation (NERC) forecasts, which highlighted the deficiencies of the existing transmission infrastructure, particularly in constrained areas such as California, and stressed that the need for long-distance transmission is of particular importance for renewable energy resources and for California's ability to meet its RPS (discussed above in Section 1.2.2). The WWEC PEIS also cited the DOE's National Electric Transmission Congestion Study, which was prepared in response to Section 1221(a) of the EPAct and analyzed the transmission grid to determine locations where reliability and capacity were being impacted by congestion. The report cited several factors as contributing to congestion, including increased energy demands and lack of planning and investment in the transmission grid over the past decade. The only critical congestion area in the western United States identified by the DOE study was southern California (DOE 2006).

Secretarial Order 3285

Secretarial Order 3285, issued by the Secretary of the Interior on March 11, 2009, establishes the policy of "encouraging the production, development, and delivery of renewable energy" as one of the DOI's "highest priorities."

1.2.3 State Purpose and Need

The CPUC's purpose and need for the EITP is to respond to SCE's application for a CPCN under California Public Utilities Code Section 1001, et seq., and General Order 131-D. The purpose of this EIR is to disclose any environmental impacts associated with the project, in compliance with CEQA, to assist CPUC decision makers in determining whether to issue a CPCN for the EITP. ~~Pursuant to Article XII of the Constitution of the State of California, the CPUC is charged with regulation of investor-owned public utilities, including SCE~~. ~~The CPUC is the lead state agency for CEQA compliance in evaluating the project and is responsible for issuing a decision on the applicant's CPCN application. The purpose of this EIR is to disclose any environmental impacts associated with the proposed project and its alternatives and to assist the agency in determining whether to issue a CPCN for the EITP.~~

~~The need for the proposed project is driven by state requirements for the interconnection and distribution of renewable energy. The CEC has identified lack of transmission infrastructure as a barrier to accessing remote renewable energy resources (CEC 2007).~~

1.2.4 Federal Purpose and Need

The BLM's purpose and need for the EITP is to respond to SCE's application under Title V of the Federal Land Policy and Management Act (FLPMA; 43 USC 1761) for a ROW grant to construct, operate and decommission a 230-kilovolt (kV) transmission line, substation, and associated infrastructure on public land in compliance with FLPMA, BLM ROW regulations, and other applicable federal laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant to SCE for the proposed EITP. The decision the BLM will make is whether or not to grant a ROW, and if so, under what terms and conditions.

Land Use Plan Conformance

The majority of the EITP would be located on federal land managed by the BLM. All actions approved or authorized by the BLM must conform to the existing land use plan where one exists (43 CFR 1610.5-3, 516 DM 11.5).The land use plans applicable to the project are the BLM CDCA Plan of 1980, as amended, and the Las Vegas RMP of 1998, as amended.

The EITP would be in conformance with both applicable BLM land use plans. The CDCA Plan includes an Energy Production and Utility Corridor Element, which designates a regional network of utility planning corridors. Within California, the proposed project would replace an existing ROW within established energy corridors that allow for electrical transmission of 161-kV and above. The project is in conformance with the Las Vegas RMP Record of Decision as it states that all public lands within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for ROWs under the authority of the Federal Land Policy Management Act. The location of the proposed project in relation to established energy corridors is shown in Figure 1-2.

Because the transmission systems are an allowable use of the land in established energy corridors, the proposed project does not conflict with any applicable land use plans. Additionally, as described above, the proposed project would be in conformance with WWEC PEIS, which amended the CDCA Plan and the Las Vegas RMP.

Other Agency Plans. For portions of the proposed project or its alternatives that would be located on land managed by local agencies, all applicable plans, policies, and regulations are discussed in Section 3.9, "Land Use," of this document, as well as within other resource sections, as applicable.

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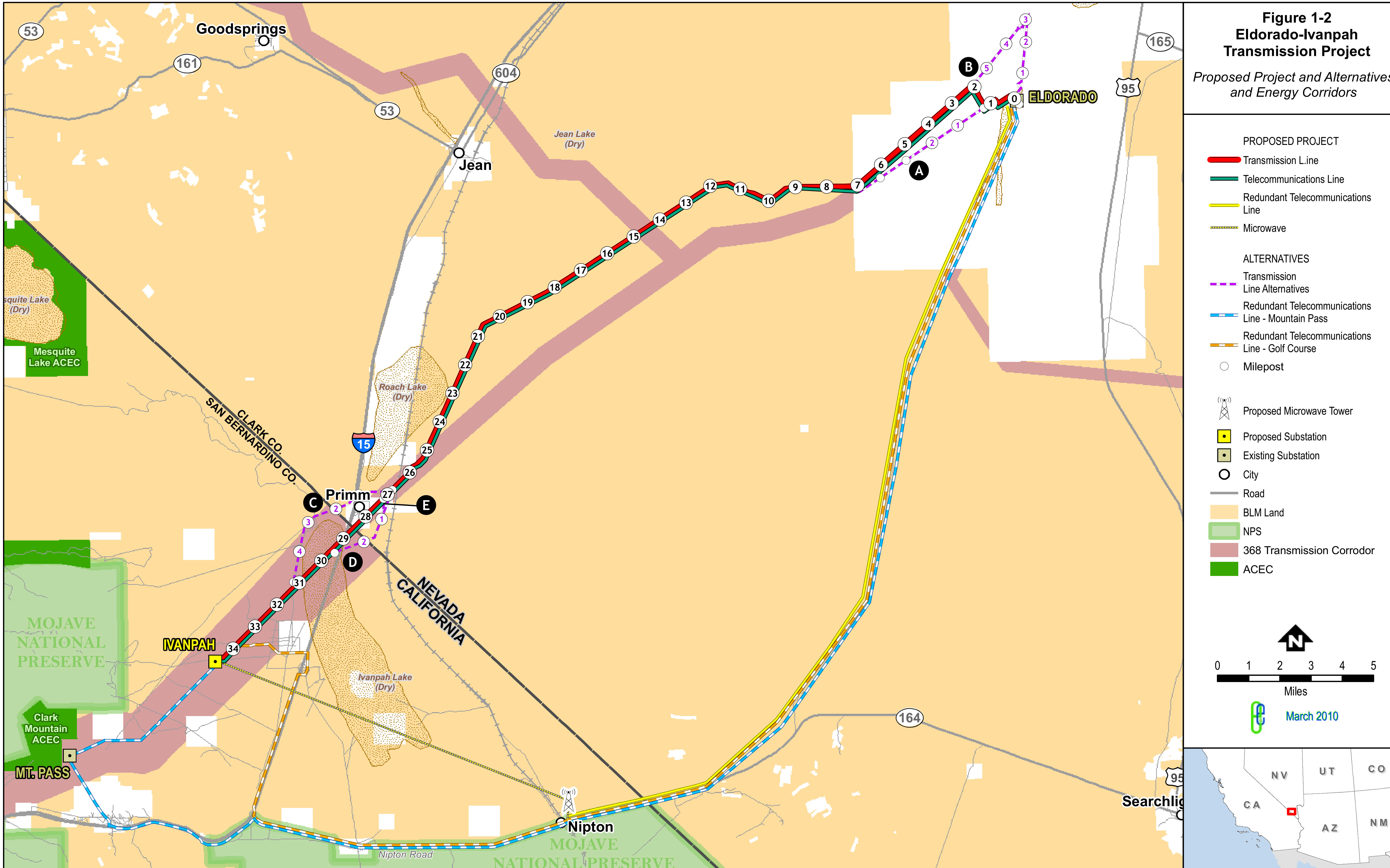

Figure 1-2
Eldorado-Ivanpah Transmission Project
Proposed Project and Alternatives and Energy Corridors

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1.2.5 Joint State and Federal Objectives

Having taken into consideration the applicant's seven objectives as listed in Section 1.2.1, the CPUC and BLM identified the following abridged objectives~~Based on the content of the PEA and related federal and state objectives, the CPUC and the BLM have abridged the objectives for the proposed project to the following~~:

1. To connect renewable energy sources in the Ivanpah Valley area in compliance with Executive Order 13212, EPAct, the Federal Power Act, California Senate Bill 1078, and California Senate Bill 107;
2. To improve reliability in compliance with applicable standards, including NERC, WECC, CAISO, and SCE standards; and
3. To maximize the use of existing ROW and designated utility corridors to minimize impacts on environmental resources.

1.3 Other Agency Use of the EIR/EIS

Several other agencies will rely on information in this environmental document to inform them in their decisions regarding issuance of specific permits related to project construction or operation. On the state level, agencies such as the California and Nevada Departments of Transportation, California Department of Fish and Game (CDFG), the Nevada Division of Wildlife, Regional Water Quality Control Boards, the Department of Conservation and National Resources, and the California and Nevada Offices of Historic Preservation will be involved in reviewing and/or approving the proposed project. In addition to the BLM, federal agencies with potential reviewing and/or permitting authority include the U.S. Army Corps of Engineers (USACE), the USFWS, the Advisory Council on Historic Preservation (ACHP), and the Occupational Safety and Health Administration (OSHA).

No local discretionary (e.g., use) permits are required because the CPUC has preemptive jurisdiction over the construction, maintenance, and operation of the applicant's facilities in California. The applicant would still have to obtain all ministerial building and encroachment permits from local jurisdictions, and the CPUC's General Order (GO) 131-D requires the applicant to comply with local building, design, and safety standards to the greatest degree feasible to minimize project conflicts with local conditions. The CPUC's authority, however, does not preempt special districts, such as the Mojave Desert Air Quality Management District or other state agencies or the federal government.

In Nevada, construction of a utility facility, defined as a transmission line that is 200 kV or more, requires a permit by the Public Utilities Commission of Nevada (PUCN) under the Utility Environmental Protection Act (UEPA) according to Nevada Revised Statutes (NRS) 704.820 through 704.900. However, replacement of an existing facility with a like facility, as determined by the PUCN, does not constitute construction of a utility facility (NRS 704.865).

Federal, state, and local permits and approvals would be required before construction and operation of the project. A list of the major permits, approvals, and consultations required is presented in Table 1-2. The applicant would be responsible for obtaining all permits and approvals required to implement the project.

Table 1-2 Major Permits, Approvals, and Consultations

Agency	Required Permit or Approval	Agency Action
Federal Agencies		
Bureau of Land Management	Right-of-Way Grant	Consider granting rights-of-way for portions of the proposed project that would encroach on BLM-administered lands.
	Notice to Proceed	Following issuance of the right-of-way grant and approval of the Construction Operation and Maintenance Plan, consider issuance of a Notice to Proceed with development and mitigation activities.
Advisory Council on Historic Preservation	Section 106 Consultation, National Historic Preservation Act	Has the opportunity to comment if the proposed project may affect cultural resources that are either listed on or eligible for listing on the National Register of Historic Places.
United States Fish and Wildlife Service	Compliance with California and federal Endangered Species Acts and the U.S. Fish and Wildlife Service; Section 7 consultation and biological opinion	Consider lead agency's finding of impact on federally listed or proposed species. Provide Biological Opinion if the proposed project is likely to adversely affect federally listed or proposed species or their habitats.
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.
	Compliance with the Bald and Golden Eagle Protection Act	Determine whether the project would be in compliance with the Bald and Golden Eagle Protection Act
U.S. Army Corps of Engineers	Clean Water Act §404 permit (nationwide or individual)	Consider issuance of a Clean Water Act §404 Nationwide 12 for discharge of dredged or fill material for construction of the transmission line across rivers, streams, and wetlands.
Federal Aviation Administration	Hazard/No Hazard Determination (14 CFR Part 77)	Issue a hazard/no hazard determination for any structure over 200 feet or within 20,000 feet of a public airport.
California State Agencies		
California Public Utilities Commission	Certificate of Public Convenience and Necessity	Consider issuing a Certificate of Public Convenience and Necessity to construct and operate the project.
California Department of Fish and Game	Compliance with California and Federal endangered species acts and similar regulatory requirements; development of final biological opinions by the California Department of Fish and Game, the Nevada Department of Wildlife, and the U.S. Fish and Wildlife Service	Review the proposed project for potential impacts to state-listed species.
	California Native Plant Protection Act	Review of mitigation agreement and mitigation plan for plants listed as rare.
	Streambed Alteration Agreement (Section 1603 of the California Fish and Game Code)	Consider issuance of Section 1603 Streambed Alteration Agreement for crossing of any lake or stream or other drainages by trenching.

Table 1-2 Major Permits, Approvals, and Consultations

Agency	Required Permit or Approval	Agency Action
California Regional Water Quality Control Board (Santa Ana Region 8; Colorado River Basin Region 7)	Section 401 Water Quality Certification Permit	Consider approval of certification of activities related to dredge and fill materials.
	National Pollutant Discharge Elimination System (NPDES) Permit or Report of Waste Discharge (RWD)	Consider issuance of a National Pollutant Discharge and Elimination System permit or Report of Waste Discharge permit for discharge of hydrostatic test water or construction dewatering to surface waters or onto dry lands, respectively.
California State Water Resources Control Board	General Construction Activity Storm Water Permit for construction activities on a project of 5 acres or larger	Consider authorization for stormwater discharges to surface waters, pursuant to a General Construction Activities Permit for Construction.
	Temporary permit to use appropriate water	Consider issuance of temporary permit for use of water from a surface stream or other body of water for use in dust suppression or project maintenance activities.
California Department of Transportation	Encroachment Permit	Consider issuance of permits for any activities affecting state highways or within highway easements, including placement of transmission lines across, within, under, or over statement highway rights-of-way.
California State Historic Preservation Office	Section 106 Consultation, NHPA	Consult with the BLM, the applicant, appropriate land management agencies, and others regarding proposed project activities that may affect cultural resources.
Mojave Desert Air Quality Management District	Dust Control Plan	Consider issuance of temporary permit for construction activities causing fugitive dust.
Nevada State Agencies		
Nevada Department of Wildlife	Compliance with Nevada Revised Statutes and regulations that affect wildlife issues	Authorization for certain special status and protected species (e.g., desert tortoise).
Nevada Department of Transportation	Encroachment Permit	Consider issuance of permits for any activities affecting state highways or within highway easements, including placement of transmission lines across, within, under, or over statement highway rights-of-way.
Nevada Department of Environmental Protect ion, Water Pollution Control Board	National Pollutant Discharge Elimination System Permit or Report of Waste Discharge	Consider issuance of NPDES Permit or RWD for discharge of water used for dust suppression or operation to surface waters or onto dry lands.
Public Utilities Commission of Nevada	Utilities Environmental Permitting Act for installation of a major utility in the State of Nevada	The PUCN is not involved at this stage of the process but the CPUC will be consulting with the PUCN on the project.

1.4 Overview Permitting and Environmental Review Process

1.4.1 Permitting Process

The applicant has filed an application for a CPCN with the CPUC as well as an application for a ROW grant from the BLM. This section describes the permitting processes of the respective agencies.

1.4.1.1 CPUC Process

Under California Public Utilities (PU) Codes Section 1001 et seq., investor-owned utilities such as SCE are required to obtain a permit from the CPUC for construction of certain specified infrastructure, including transmission lines over 50 kV and substations. Due to the size and components of the proposed transmission line, the proposed project requires a CPCN. Application for a CPCN triggers two concurrent processes: an environmental review pursuant to CEQA, and the review of project need and costs pursuant to PU Code Sections 1001 et seq. and GO 131-D.

The process of environmental review includes preparation of this document. The process of project costs and need review includes the following procedures and milestones: allowing parties to respond to or protest an application, conducting a pre-hearing conference, publishing a scoping memo, conducting public participation hearings, filing testimony, conducting evidentiary hearings, and publishing briefs. The results of both processes are considered in the CPUC's proposed and final decisions.

1.4.1.2 BLM Process

The proposed ROW application must satisfy the requirements of both the FLPMA and NEPA. FLPMA provides BLM's primary management direction to administer the public lands under multiple use and sustained yield principles based on land use allocations made in comprehensive land use plans. For the subject lands, BLM developed land use plans under FLPMA to identify which lands within the CDCA and in Nevada are appropriate for transmission line ROWs. The BLM will use the NEPA process to evaluate the direct, indirect, and cumulative impacts of the specific proposal and a range of reasonable alternatives. BLM is also required to make a land use conformity determination. This analysis is explained in more detail in Section 3.9 of this document, "Land Use."

The BLM review process includes the following steps: the applicant files an application and Plan of Development; the BLM conducts an analysis under NEPA to disclose impacts and mitigation; the BLM publishes a Draft EIS and allows a 45-day comment period; the BLM responds to comments in a Final EIS; and the BLM publishes a Record of Decision with decision to approve, approve with mitigation, or deny the application. The opportunities for public comment during this process are described below.

1.4.2 Opportunities for Public Review and Comment

This section outlines the opportunities for public review and comment on the Draft EIR/EIS. The CPUC and the BLM rely on public input to help identify key issues, develop a range of alternatives, refine the environmental analysis, and develop appropriate mitigation. ~~Figure 1-3 shows an overview of the environmental review process and highlights opportunities for public involvement.~~

1.4.2.1 Agency and Public Scoping

Following publication of the Notice of Preparation and the Notice of Intent on July 23 and July 27, 2009, respectively, the EITP 30-day public scoping period began. The scoping period officially closed on August 26, 2009, 30 days after the publication of the Notice of Intent. Comments made during the scoping period were submitted at the scoping meetings and via facsimile, mail, or email. These comments were incorporated into this Draft EIR/EIS, as noted throughout the document.

During this 30-day scoping period, the CPUC and the BLM also engaged a number of public agencies. A detailed report on the public participation and agency notification is included in Chapter 7, "Consultation and Coordination."

1.4.2.2 Comments on the Draft EIR/EIS

~~In accordance with CEQA (CEQA Guidelines 15087) and NEPA (CEQ Guidelines 40 CFR 1056.9), publication of this Draft EIR/EIS initiated a 45-day public review and comment period. During this public review period, a public meeting will be held to receive public comment on the Draft EIR/EIS. Public meetings will be announced at least 14 days in advance through mailings and news releases. Comments on the Draft EIR/EIS will be considered in the Final EIR/EIS, and may be submitted at the public meeting or via facsimile, mail, or email. Contact information for commenting on this document is as follows:~~

~~Mail: Eldorado–Ivanpah Transmission Project~~
~~c/o Ecology and Environment, Inc.~~
~~130 Battery Street, Suite 400~~
~~San Francisco, CA 94111~~

~~Email: Ivanpah@ene.com~~

~~Phone: 877-478-4686~~
~~Fax: 415-981-0801~~

~~More information can be found on the EITP website: www.cpuc.ca.gov/environment/info/ene/ivanpah/ivanpah.html.~~

~~Correspondence related to review of the Draft EIR/EIS and public hearing will be included as an appendix to the Final EIR/EIS. Substantive comments received on this Draft EIR/EIS will be considered in finalizing the document, and responses to comments will be provided in an appendix to the Final EIR/EIS.~~

In accordance with CEQA (CEQA Guidelines 15087) and NEPA (CEQ Guidelines 40 CFR 1056.9), publication of the Draft EIR/EIS initiated a 45-day public review and comment period. During this public review period, a public meeting was held to receive public comment on the Draft EIR/EIS. An overview of the public comment process is included in Chapter 7: Consultation and Coordination of this document. Comments on the Draft EIR/EIS are considered in this Final EIR/EIS, and is included as in Appendix G of this Final EIR/EIS.

1.5 Reader's Guide to the Document

This section identifies the organization of the EIS/EIR and specifies the surveys and information used in its preparation.

1.5.1 Organization of the EIR/EIS

The EIR/EIS is organized as follows:

Executive Summary: A summary of the description of the proposed project, alternatives, the environmental impacts of the project, and mitigation measures developed to minimize or avoid significant impacts.

1. Introduction: An overview description of the project, including alternatives; an explanation of the purpose of, need for, and objectives of the project; an explanation of agency roles and usage of the document; an overview of the joint CEQA/NEPA process; and a guide for public usage and understanding of the document.

2. Description of Alternatives and the Proposed Project: A detailed description of the proposed project and all alternatives, including the No Project Alternative. This includes a description of the transmission, substation, and telecommunication components of the EITP as well as a description of the ISEGS project.

3. Affected Environment/Environmental Analysis: For each resource area, a detailed description of the existing, affected environment; a description of all applicable regulations; an analysis of the impact of the project and all alternatives; a discussion of mitigation measures that would reduce or avoid impacts; an analysis of the environmental impacts of the "Whole of the Action" pursuant to CEQA; and an analysis of the environmental impacts of the "Cumulative Action" pursuant to NEPA. The analysis of the "Whole of the Action / Cumulative Action" includes a summary of the impacts of the approved ISEGS project as analyzed in applicable CEC and BLM environmental review documents as well as an analysis of the combined impact of the EITP and ISEGS for each resource area.

4. Comparison of Alternatives: An explanation of the screening process used to develop the alternatives considered in the document and eliminate alternatives not carried forward in the environmental analysis, and a comparative discussion of the proposed project and all alternatives.

5. Cumulative Analysis: An analysis of the project's potential to contribute to cumulatively significant impacts.

6. Other Environmental and Regulatory Considerations: A discussion of the project's compliance with applicable federal regulations and policies and an analysis of other considerations, including long-term and growth-inducing impacts.

7. Consultation and Coordination: An overview of the public consultation process, including agency consultation, and a list of technical staff involved in the preparation of the document.

8. References: Bibliographical information for the sources cited in the document.

Comments received on the Draft EIR/EIS and responses to those comments are included in Appendix G of this document. Changes made based on comments received on the Draft EIR/EIS were made directly in the sections listed above.

1.5.2 Surveys, Studies, and Other Documents Referenced in the EIR/EIS

This EIR/EIS was prepared using information provided by the applicant as well as information contained in technical reports and studies conducted to provide an environmental baseline against which to measure the potential environmental impact of the EITP. This EIR/EIS also notes the applicable laws, policies, and plans that were reviewed in assessing the project's regulatory compliance.

The applicant submitted a PEA with the application to the CPUC on May 28, 2009. The PEA included the applicant's purpose and need and a detailed description of the proposed project and all alternatives considered by the applicant. The environmental analysis portion of the PEA assesses impacts on 15 resource areas that are expected in an EIR/EIS. In addition to the information included in the PEA, the applicant has submitted responses to specific questions asked by the BLM and the CPUC, including requests for additional information or requests to clarify information already submitted. The applicant's Draft Plan of Development was submitted to BLM in September 2010.

Technical reports were prepared to facilitate the analyses of certain issues and resources: aesthetics, air quality, biological, geological, minerals and soils, hydrology and water quality, noise, and cultural resources. Because of the level of technical detail in these reports, they have been referenced in the resource sections and included as appendices to the document.

Each of the resource sections also includes a description of all applicable regulations. These include any federal, state, or local laws, plans, or policies relevant to the resource area. For example, Section 3.4, "Biological Resources," provides an overview of the CDCA Plan, the BLM's plan for the portion of the project that would be in California, and the Las Vegas RMP, which is the plan for the portion of the project that would be in Nevada. Section 3.4 also considers any applicable Multiple Species Habitat Conservation Plans, the federal Endangered Species Act, the Clean Water Act, the Migratory Bird Treaty Act, the California Endangered Species Act, and the CDFG code, including the California Native Plant Protection Act. All federal, state, and local plans policies and regulations are publicly available.

For the Whole of the Action / Cumulative Action analysis within this document, the CPUC and the BLM incorporated the analysis performed by the CEC and the BLM for the ISEGS project. The ISEGS FSA/DEIS was published November 4, 2009. ~~This document is the CEC functional equivalent of a CEQA document and satisfies the NEPA requirements of the BLM.~~ Subsequent to the publication of the FSA/DEIS, the CEC and the BLM split their environmental review processes. The CEC published the FSA Addendum on March 16, 2010, an Errata to Air Quality Section of the FSA Addendum on April, 30, 2010, and the Presiding Member's Proposed Decision on August 3, 2010. The CEC approved the ISEGS project on September 22, 2010. The BLM published a Supplement to the DEIS in April 2010 and a Final EIS in July 2010. The Secretary of the Interior signed the ROD on October 7, 2010. These documents were used in updating the information on the ISEGS project for this Final EIR/EIS for EITP. Because ~~this~~ the ISEGS documents ~~was~~ were prepared using the format and criteria designed by the CEC to fulfill CEQA, there may be some differences in methodology, significance criteria, and overall organization of resource areas between ~~this document~~ the CPUC and the BLM analysis of the EITP and the CEC and BLM analysis of the ISEGS project. For example, the ISEGS ~~FSA/DEIS~~ documents analyze~~s~~ impacts on soil and water together, whereas this EIR/EIS contains a hydrology and water quality analysis that is separate from the geology, soils, minerals, and paleontology analysis. Additionally, there are differences in style and approach between the two ~~documents~~ environmental analyses. For example, the ISEGS ~~FSA/DEIS~~ documents contain~~s~~ Conditions of Certification, which are similar to the mitigation measures required in this document; one key difference between the two is that the Conditions of Certification include compliance with applicable laws (such as water quality standards). For the analysis of the environmental impacts of the EITP, compliance with laws is considered required and, in most instances, compliance with applicable laws is not included as mitigation. However, despite any differences between the two documents, the CPUC and the BLM will not re-analyze the environmental impacts of the ISEGS project within this document~~, but will include them in Chapter 5 of this document for disclosure purposes and to assist the agencies in their decision making process~~. Instead, this document contains a summary of the impacts of the ISEGS project for each resource area in Chapter 3: Environmental Consequences. Additionally, this Final EIR/EIS for the EITP contains an analysis of the combined impacts of the EITP and ISEGS to assist agency decision-makers and fully disclose to the public the impacts of the "Whole of the Action / Cumulative Action."

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2. Description of Proposed Project and Alternatives

2.1 Introduction

This chapter describes in detail the Eldorado–Ivanpah Transmission Project (EITP) proposed by Southern California Edison (SCE; the applicant) and its alternatives.~~ The purpose of the proposed project is to provide the transmission facilities necessary to interconnect with and deliver up to 1,400 megawatts (MW) of energy from renewable sources that is expected to be generated in the Ivanpah Valley area in compliance with federal and state requirements discussed in Chapter 1.~~ As discussed in Chapter 1, the purpose of the EITP is to provide the transmission facilities necessary to interconnect renewable sources expected to be generated in the Ivanpah Valley area in compliance with federal and state requirements.

The proposed project would involve several types of transmission upgrades to connect potential renewable energy generated in the Ivanpah Valley area to the transmission grid controlled by the California Independent Service Operator (CAISO). A new 230/115-kilovolt (kV) Ivanpah Substation, a double-circuit 230-kV transmission line between the existing Eldorado Substation and the Ivanpah Dry Lake area to replace the existing 115-kV line, and a telecommunication system would be constructed. The reliability of the existing 115-kV transmission line would also be improved in compliance with the North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) planning criteria, the NERC reliability standards, and the applicant's standards. An overview map showing the location of the proposed project components and alternatives is provided in Figure 2-1.

In addition to considering the project as proposed by SCE, this Final EIR/EIS analyzes the potential environmental impacts of a number of alternatives to the proposed project. The alternatives to the proposed project included in this chapter are the outcome of a California Public Utilities Commission (CPUC) and Bureau of Land Management (BLM) screening process that identified and analyzed a full range of reasonable alternatives. The alternatives considered during the screening process include those proposed by the applicant as part of the design of the proposed project, those proposed by the lead agencies as part of environmental review, and ideas for potential alternatives suggested by agencies and the public during the 30-day EITP scoping period that began after publication of the Notice of Preparation and the Notice of Intent for the project, and during the 45-day public comment period on the Draft EIR/EIS. A total of 19 alternatives were analyzed in four major categories: system, transmission line routing, telecommunication, and technology. Alternatives that were determined to meet the CEQA/NEPA criteria agreed upon by the CPUC and the BLM were retained for full analysis in the Final EIR/EIS. A description of alternatives to the ISEGS project included in the Whole of the Action / Cumulative Action is not included in this Chapter as the ISEGS project has been certified by the California Energy Commission (CEC) and approved by the BLM in the Record of Decision (ROD).

Technical information about the proposed project in this chapter was provided by the applicant. All numbers referring to mileage, land disturbance, equipment, schedule, and workforce are based on preliminary engineering completed by the applicant in the Proponent's Environmental Assessment (PEA) as part of Application A.09-05-027, submitted on May 28, 2009, to the CPUC~~California Public Utilities Commission (CPUC)~~. Additionally, changes to the preliminary engineering design described in the PEA provided by the applicant and reviewing agencies have been incorporated into this Final EIR/EIS.

~~In addition to considering the project as proposed by SCE, this Draft EIR/EIS analyzes the potential environmental impacts of a number of alternatives to the proposed project. The Bureau of Land Management (BLM) and the CPUC identified a full range of reasonable alternatives to systematically analyze and screen alternatives. The alternatives considered during the screening process include those proposed by the applicant as part of the design of the proposed project, those proposed by the lead agencies as part of environmental review, and ideas for potential alternatives suggested by agencies and the public during the 30-day EITP scoping period that began after publication~~

~~of the Notice of Preparation and the Notice of Intent for the project. A total of 18 alternatives were analyzed in four major categories: system, transmission line routing, telecommunication, and technology. Alternatives that were determined to meet the CEQA/NEPA criteria agreed upon by the CPUC and the BLM were retained for full analysis in the Draft EIR/EIS.~~

This chapter first provides general transmission system information (Section 2.1.2) and further describes the proposed project (Section 2.2), starting with an overview of the core project features, including the different transmission lines, substations, and telecommunication system. In addition, it provides a summarized description of ~~bes related renewable energy~~ the Ivanpah Solar Electric Generating System (ISEGS) project~~s~~, as part of the CEQA Whole of the Action / BLM Cumulative Action approach. Section 2.3 describes the major features of the EITP alternatives, including routing, telecommunication, and technology, and explains their selection as a result of the alternatives screening process. Sections 2.4 and 2.5 describe the construction techniques and operation and maintenance activities applicable to the proposed project and its alternatives. Lastly, Section 2.6 introduces the cumulative projects in the area to be further analyzed in Chapter 5 of this ~~Draft~~ Final EIR/EIS.

2.1.1 Transmission System Background Information

This section contains general information on transmission systems and defines technical terms used throughout this document. It is intended to help the non-technical reader understand the description of the proposed project and its alternatives by explaining how transmission systems operate and defining transmission system components.

2.1.1.1 Electric Transmission Systems Overview

Electric transmission systems deliver electricity to consumers from power generating facilities. Delivering large quantities of power from remote locations such as the Ivanpah Valley area to high-consumption developed areas requires several steps. High-voltage transmission lines deliver the electricity from the generating facility to a transmission substation. The transmission substation contains transformers, which lower the voltage of the electricity and distribute the power through numerous lower-voltage subtransmission lines. Subtransmission lines then deliver the power to distribution substations, which further lower the voltage and distribute the power through distribution lines to individual consumers (Figure 2-2).

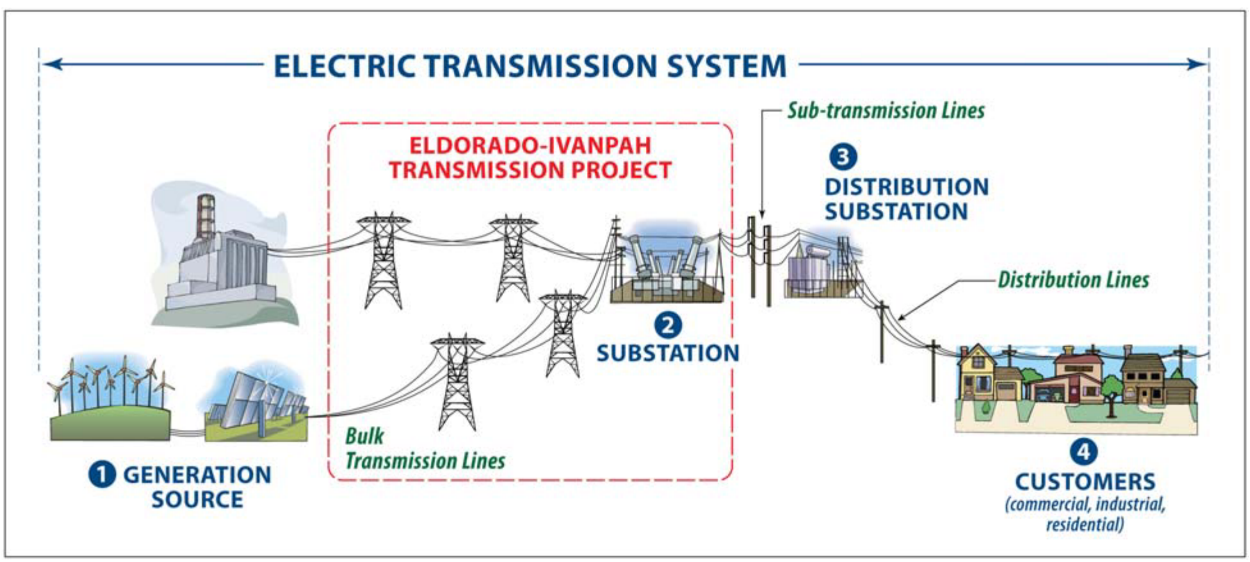

Figure 2-2 Electric Transmission System

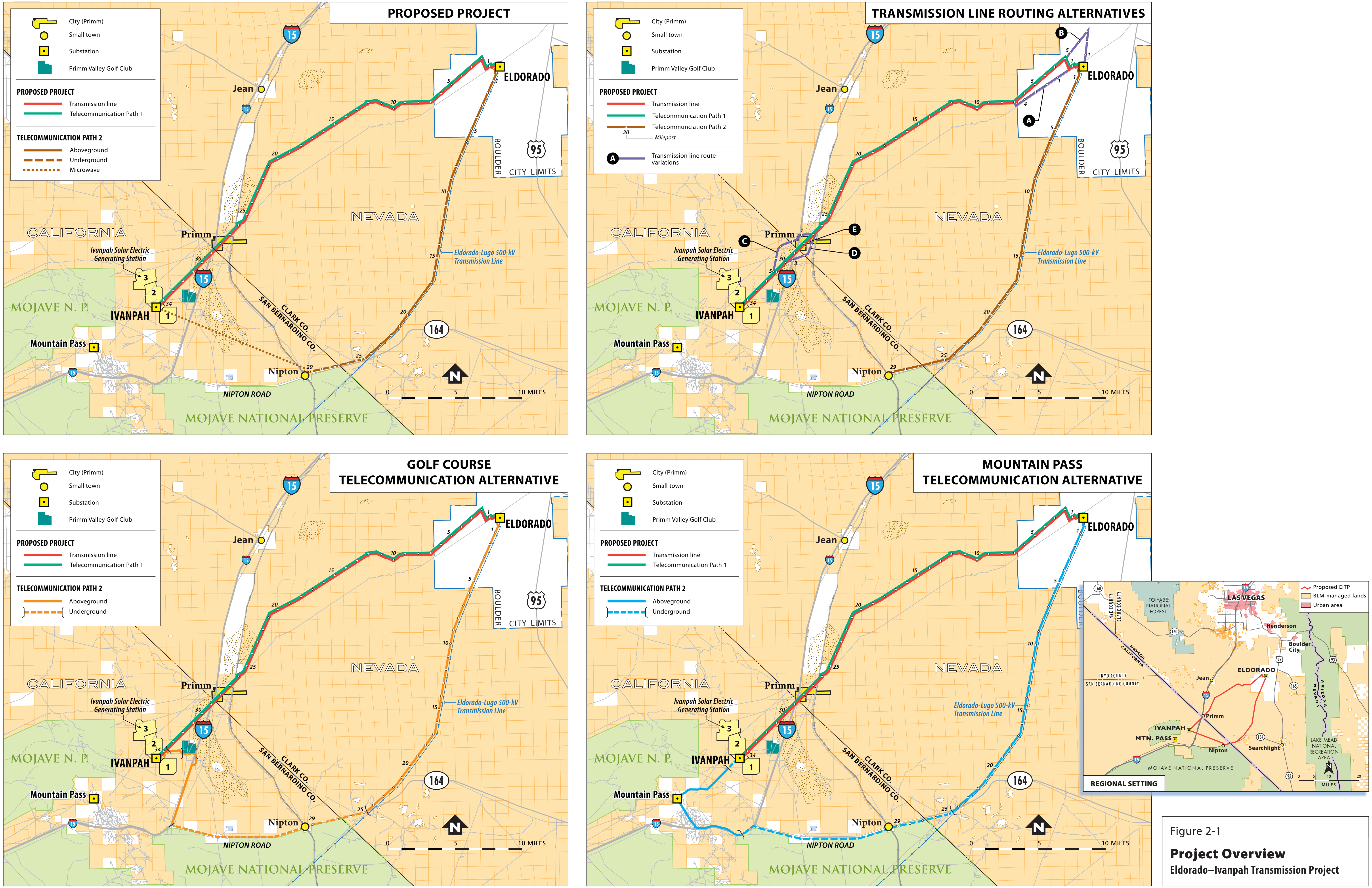

Figure 2-1

Project Overview

Eldorado–Ivanpah Transmission Project

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Transmission systems also have a telecommunication component, which facilitates communication between substations and allows substations to be monitored for system safety and reliability. Safety and reliability standards require two redundant telecommunication paths, physically separated from each other, so that if the integrity of one path is compromised, the substations will be able to maintain communication. Telecommunication paths can be installed aboveground or in underground ducts, or they can use microwave towers.

2.1.1.2 Transmission System Components

Structures

Transmission lines can be installed underground in ducts or strung overhead on transmission structures. Underground transmission line installation is not proposed for this project. To select the appropriate structure for a transmission line, a number of factors are considered, including the technical feasibility of installing the structure in different terrains, the space available for the footprint of the structure, and aesthetic regulations or concerns. A single transmission line can be constructed on multiple types of structures. The structures discussed in this document include the following (see Section 2.2.1.3 for more detail):

- Lattice Steel Towers (LSTs), which consist of a steel framework that is bolted or welded together.
- Tubular Steel Poles (TSPs), which are hollow steel poles consisting of ~~one or~~ two or more ~~pieces~~ sections ~~welded~~ slip-jointed together.
- H-frame Structures, which can be constructed with a lattice steel structure or with tubular steel. They have two separate footprints as opposed to the standard single foundation.

Conductors and Insulators

Conductors are wires that carry the electrical current. They typically consist of many aluminum wires wrapped around a steel core for reinforcement, and are strung along the transmission structures from generation facility to substation or substation to distribution station or distribution station to electricity consumer.

To prevent the electrical current from transferring to the transmission structures, conductors are connected to transmission structures via glass, porcelain, polymer, or silicon insulators. Electrical current can flow freely through metal; non-metal insulators serve as a buffer between the aluminum and steel conductors and the steel transmission structures. The two common types of insulators are:

- Horizontal post-type insulators, which extend perpendicular to the transmission structure and support the conductor on the side of the structure.
- Suspension-type insulators, which suspend the conductor below the top of the structure.

Ground Wires

Ground wires, also called “shield wires” or “earth wires,” are placed on the tops of transmission structures above the conductors to guard against lightning strikes. Accordingly, they are also called overhead ground wires. Ground wires may also contain a fiber optic communication line so that a signal can be directed to a nearby substation if a problem occurs along a portion of the line; this type of cable is called an optical ground wire.

Circuits

Transmission lines consist of multiple conductors along which the electrical current flows; these are called circuits. Alternating current (AC) power transmission lines generally use a three-phase system for each circuit. The three-phase system consists of three conductors that carry electric current at the same frequency and different time cycles, thus providing power transfer capacity. Each phase typically consists of only one wire, but may contain two or more bundled conductors.

Transmission structures can be designed to support either single circuits or double circuits. Single-circuit structures support one circuit containing three phases ~~are typically used for voltages up to 200 kV and can help reduce unwanted side effects such as noise and radio interference~~ (Figures 2-5 and 2-8). Double-circuit structures support two circuits, each circuit consisting of three phases. Each phase typically consists of two or more conductors, to increase the line's capacity ~~for voltages over 200 kV~~ (Figure 2-4). The use of electrical phasing and double-circuit configurations have reported several technical advantages, including minimizing electric and magnetic fields to the extent practical, which can result in a reduction of audible-noise and electromagnetic interference effects (BPA 2006).

2.2 Description of the Proposed Project

2.2.1 Core Project Description (NEPA/CEQA)

2.2.1.1 Project Overview and Location

The core project includes the transmission upgrades and associated transmission infrastructure and the alternatives included in the application submitted by SCE to the CPUC and the BLM. The applicant proposes to construct, operate, and maintain new and upgraded transmission facilities to deliver electricity from several solar energy facilities proposed to be built in the Ivanpah Valley area. The upgraded transmission lines would extend approximately 35 miles from southern Clark County, Nevada, to northeastern San Bernardino County, California. Approximately 28 miles of the project are in Nevada and 7 are in California (Figure 2-3, Table 2-1). The proposed project would include the following components:

- **Powerlines**
  - **Eldorado–Ivanpah Transmission Line –** A new double-circuit 230-kV transmission line, approximately 35 miles long, would be constructed between the existing Eldorado Substation in Nevada and the proposed Ivanpah Substation in California. It would replace a portion of the existing 115-kV transmission line that runs from Eldorado ~~through Baker, Cool Water, and Dunn Siding to Mountain Pass~~ to Mountain Pass, through Baker, Dunn Siding, and Cool Water Substations[1]. The existing 115-kV transmission line that runs west of the proposed Ivanpah Substation to Mountain Pass Substation would remain unchanged and it not part of the proposed project.
  - **Subtransmission Line –** A proposed 600- to 800-foot-long ~~addition to an existing~~ 115-kV subtransmission line ~~from a connection point~~ would connect the remaining portion of ~~on~~ the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass ~~115-kV~~ line ~~would connect~~ to the proposed Ivanpah Substation ~~to the existing 115-kV subtransmission system~~.
  - **Distribution Lines –** A proposed 33-kV distribution circuit, consisting of approximately 5,200 feet of new underground facilities and 5,900 feet of overhead lines, would be constructed to provide light and power to the proposed Ivanpah Substation and microwave telecommunications site in Nipton, California. Approximately 400 feet of new ~~A 1-mile extension of the existing Nipton 33-kV distribution line would be constructed with~~ underground circuitry would be constructed to provide light and auxiliary power to the proposed Ivanpah Substation. In addition, the new distribution circuit includes a new 4,300-foot segment of 33-kV overhead lines, and a new underground service would ~~from the existing Nipton 12-kV distribution line would be built to~~ provide power to a proposed microwave telecommunications site.

[1] The Public Utilities Commission of Nevada (PUCN) has determined that the replacement of an existing facility with a like facility does not constitute construction of a utility facility (NRS 704.865).

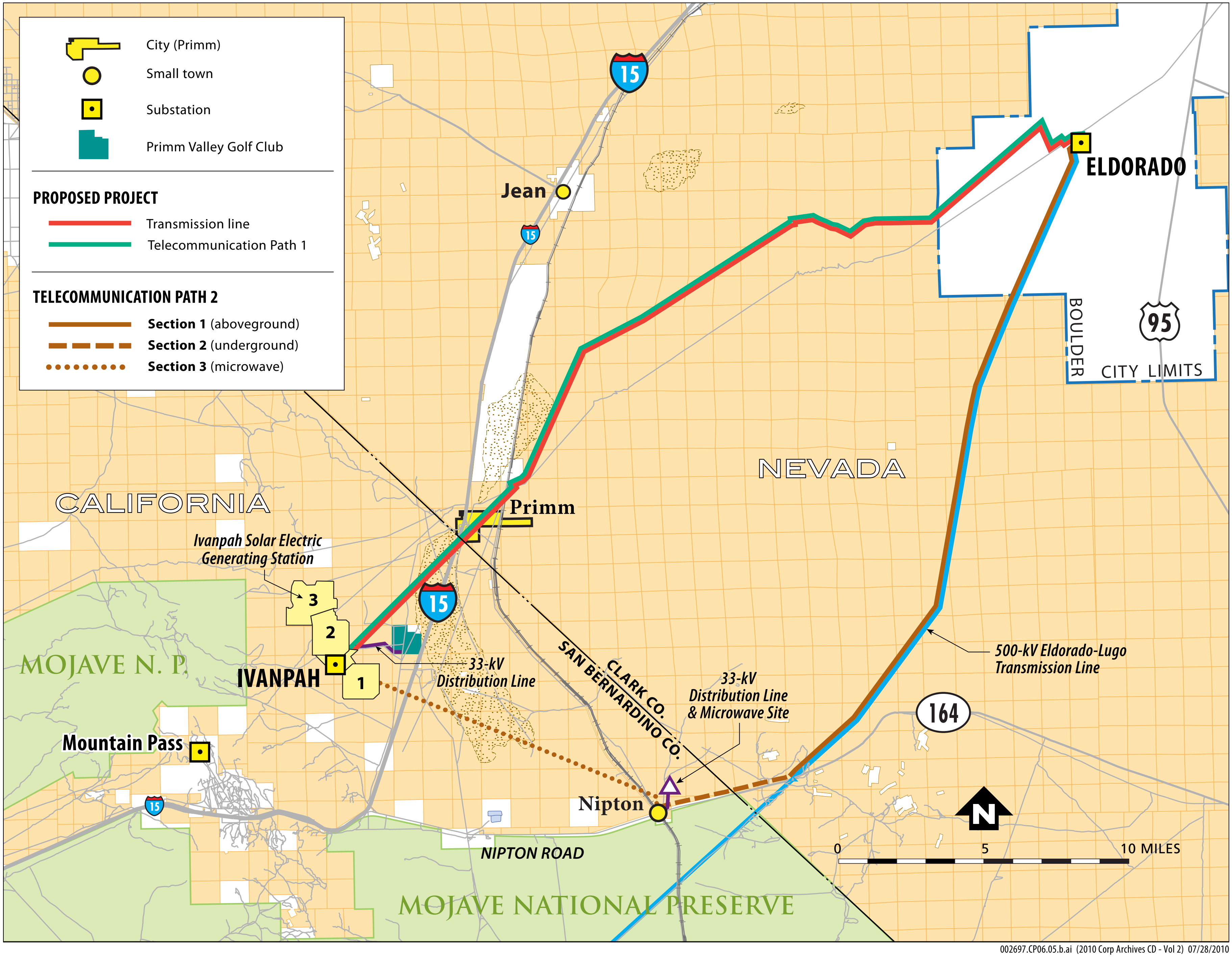

Figure 2-3 **Proposed Project**

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- **Substations**
  - **Ivanpah Substation –** The proposed substation would be located in California near Primm, Nevada, and would serve as a connector hub for solar energy generated in the Ivanpah Valley area. The substation would include a mechanical and electrical equipment room and a microwave tower.
  - **Eldorado Substation –** Changes inside the existing Eldorado Substation would be made to accommodate the new Eldorado–Ivanpah 230-kV transmission line.
- **Telecommunication System**
  - Existing overhead ground wire would be replaced with optical ground wire on an approximately 25-mile section of the existing Eldorado–Lugo 500-kV transmission line.A 4.8-mile-long underground duct from the Eldorado–Lugo 500-kV transmission line to a proposed communication site in Nipton, California, would be installed.
  - A microwave communication site in Nipton that would consist of a communication building, a microwave tower, and an emergency generator.
  - A microwave path (approximately 12 miles) between Nipton and the proposed Ivanpah Substation would be installed that would consist of two 180-foot-tall communication towers.
  - A communications room would be installed in the mechanical and electrical equipment room (MEER) at the new Ivanpah Substation to house communication equipment.
  - Telecommunication equipment would be installed at the Eldorado Substation.

Table 2-1 Summary of EITP Components

EITP Major Components		Features	Location/ Extension
Powerlines	Eldorado–Ivanpah Transmission Line	Double-circuit 230-kV line replacing a portion of the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line	Nevada; 28 miles California; 7 miles
	Subtransmission Line	Single-circuit 115-kV line connecting the Ivanpah Substation to the existing 115-kV Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line~~system~~	California; 600 to 800 feet
	Distribution Lines	• ~~Single-circuit 33-kV and 12-kV lines to provide power to Ivanpah Substation~~ • Additional 33-kV distribution circuitry to provide power to Ivanpah Substation; and • New 33-kV overhead line to supply light and power to the proposed microwave communication site (northeast of Nipton).	California (total length); 33-kV line: ~~1 mile 12-kV line: 4,300 ft~~approximately 5,200 ft of underground and 5,900 feet of overhead
Substations	Ivanpah Substation	Connector hub for solar energy generated in the Ivanpah Valley area. Major components: • 230-kV and 115-kV switchracks • Mechanical and electrical equipment room • Microwave tower	California (near Primm, Nevada); 1,650 by 1,015 feet
	Eldorado Substation Upgrades	Extension of the existing switchyard to install two 230-kV line positions to accommodate the new double-circuit line.	Nevada (14 miles from Boulder City)

Table 2-1 Summary of EITP Components

EITP Major Components		Features	Location/ Extension
Telecommunication System	Fully diverse and redundant telecommunication paths: • optical ground wire • Combined optical ground wire and microwave	Support the SPS under specific outage contingencies, and the operation and monitoring of the substation and transmission line equipment. Overhead optical ground wire path: • Path 1: Overhead optical ground wire along the Eldorado–Ivanpah alignment • Path 2, Section 1: Overhead optical ground wire along the Eldorado–Lugo transmission line. Combined optical ground wire and microwave path: • Path 2, Section 2: Underground duct between Eldorado–Lugo 500-kV line and a new communication site in Nipton, California • Path 2, Section 3: Microwave telecommunication path between Nipton and the Ivanpah Substation.	Path 1 (overhead) Nevada; 28 miles California; 7 miles Path 2, Section 1 (overhead) Nevada; 25.5 miles Path 2, Section 2 (underground) California; 3 miles Nevada; 2 miles~~4.8 miles~~ Path 2, Section 3 (microwave) California; 12 miles
	Communication facilities: • Microwave communications site in Nipton • Telecommunication facilities at Eldorado Substation • Communication Room (MEER) at Ivanpah Substation	Support the SPS under specific outage contingencies, and the operation and monitoring of the substation and transmission line equipment.	California: Nipton and proposed Ivanpah Substation site.

Key: kV = kilovolt; SPS = Special protection system

Construction of the EITP components would also involve the temporary use of areas and facilities on public and private lands for equipment and material storage, structure assembly and erection, conductor pulling and tensioning, helicopter landing, and other uses. A complete description of the construction activities is provided in Section 2.4.

2.2.1.2 Existing System

The applicant would construct, operate, and maintain new and upgraded transmission facilities to deliver electricity from expected solar generation development in the Ivanpah Valley area (mostly under BLM jurisdiction) to accommodate projected load growth in the applicant's service area. The applicant's existing transmission system includes various low and high voltage lines and facilities that are part of the WECC Path 49 (East of River) and Path 46 (West of River), linking Southern California to Arizona and Southern Nevada. In addition, other utility companies, such as the Los Angeles Department of Water and Power (LADWP) and NV Energy, operate and maintain AC and direct current (DC) transmission facilities within the proposed project location.

The proposed project and its alternatives would be located on BLM land and private lands and would generally follow the applicant's right-of-way (ROW) for the Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line. The proposed EITP 230-kV transmission line would head generally west from Eldorado Substation (14 miles from Boulder City, Nevada) and cross below the following existing transmission lines:

- LADWP Eldorado–McCullough (500 kV)
- LADWP Mead–Victorville (287 kV)

- LADWP McCullough–Victorville 1 (500 kV)
- LADWP McCullough–Victorville 2 (500 kV)
- LADWP Intermountain–Adelanto (500 kV), and
- ~~Nevada Power~~NV Energy Arden–Higgings 1&2 Powerline (~~115~~ 230 kV).

The applicant operates several electric power transmission and distribution facilities near the EITP locations (west of the California/Nevada border). These facilities consist of a single-circuit 115-kV line that connects three substations located between the Cool Water Substation (San Bernardino County) and the Eldorado Substation (Clark County): Dunn Siding Substation (1 MW), the Baker Substation (9 MW), and the Mountain Pass Substation (3 MW). In the Ivanpah Valley area, the applicant owns a single 115-kV transmission line that runs from the Cool Water Substation (San Bernardino County, California) to the Eldorado Substation (Clark County, Nevada), which is used to serve load along the way at Dunn Siding, Baker, and Mountain Pass substations. The applicant's studies indicate that the capacity of the existing 115-kV line is limited to a maximum ~~output~~ loading[2] of 80 MW. As part of additional interconnection studies conducted for new renewable energy generation, it has been determined that additional transmission upgrades to this existing 115-kV line would be necessary to provide sufficient capacity to accommodate the output of this new generation.

2.2.1.3 Components of the Proposed Project

Powerlines

Eldorado–Ivanpah Transmission Line

The route of the proposed EITP 230-kV transmission line would begin at the existing Eldorado Substation, head north, and then head west following the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line corridor, as shown in Figure 2-3. This existing 115-kV transmission line corridor is 70 to 100 feet wide. Construction and operation of the proposed 230-kV line would require widening the applicant's existing 115-kV transmission line corridor to a 130-foot-wide ROW, while a 250-foot ROW would be required at specific locations, as indicated in Table 2-2. These widened ROW areas would be mainly required for five major utility transmission line crossings below existing LADWP and NV Energy transmission lines. Transmission lines and other major existing utilities crossings along the proposed project 230-kV transmission line are shown in Figure 2-3a.

Table 2-2 250-Foot-Wide ROW Locations

Location	Between MPs
1	MP 0 and MP 1
2	MP 1 and MP 2
3	MP 7 and MP 8
4	MP 12 and MP 13
5	MP 25 and MP 26

The proposed project transmission line route would generally follow the Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line corridor, with six major deviations along the proposed 35-mile length. The segments where the proposed project would deviate from the existing 115-kV ROW are summarized in Table 2-3.

[2] Transmission systems are not limited by the system's output (i.e., net generation plus purchased energy interconnected to the system), but rather by the thermal loading or the temperature attained by the energized conductors. Thermal power flow limits usually determine the maximum power flow for lines less than 50 miles in length (PDC 2010).

Table 2-3 Major Deviations from the Existing ROW

Location (Milepost)	Distance from Existing ROW (miles)
7	> 1
11	> 1
12	> 1
25	> 1
25–26	> 1
34–35	> 1

Transmission structures for the proposed transmission line would consist primarily of LSTs (Figure 2-4); however, at the crossings, side-by-side steel H-frame structures would be used (Figure 2-5). Existing transmission lines might need to be modified at crossings.

Transmission Line Routing Description

The proposed 230-kV transmission line route would exit the northern side of the Eldorado Substation and follow the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line within existing designated utility corridors within private lands administered by BLM. In the proximity of the Eldorado Substation, there is one segment of approximately 3,000 feet—granted by BLM—that connects two designated utility corridors and would require authorization by ~~the City of Boulder~~ Clark County. At the end of this segment (milepost [MP] 2.1), the line would turn to the southwest and run for approximately 5 miles within the existing 115-kV transmission line corridor. At MP 7, the proposed route would turn west and immediately cross below the existing LADWP Intermountain–Adelanto 500-kV DC transmission line. The applicant would evaluate additional survey information to determine the optimum crossing alignment at this crossing location (Figure 2-3b).

After the first major utility crossing, the proposed 230-kV transmission line would follow the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line corridor west for approximately 3.6 miles until MP 10.7, where it would cross again under the Intermountain–Adelanto 500-kV DC transmission line (Figure 2-3b). To provide adequate space to fit the transmission tower structures necessary to cross under the Intermountain–Adelanto 500-kV DC transmission line, and to avoid multiple crossings at sharp angles, the applicant would reroute a 0.4-mile-long section of the 230-kV line on the northern side of this proposed crossing.

The proposed 230-kV line would then parallel the LADWP Intermountain–Adelanto 500-kV DC transmission line for approximately 0.9 miles and then would turn to the south and cross under the same 500-kV DC transmission line, at a location with adequate space to widen the ROW from 130 to 250 feet. It would then turn west and rejoin the existing ROW.

The line would continue southwest for approximately 13 miles (MPs 24 and 25) before new additional utility crossings, at LADWP's McCullough–Victorville No. 1 and No. 2 500-kV transmission lines, ~~the Nevada Power 115-kV transmission line~~ NV Energy Arden–Higgings 1&2 230-kV transmission line, and ~~the applicant's~~LADWP's Mead–Victorville 287-kV transmission line. The applicant would select crossing locations with adequate space to widen the existing ROW to the required width (250 feet). Following these three major crossings, the proposed EITP 230-kV transmission line would continue within the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line corridor for another 7.8 miles to finish at the proposed Ivanpah Substation site.

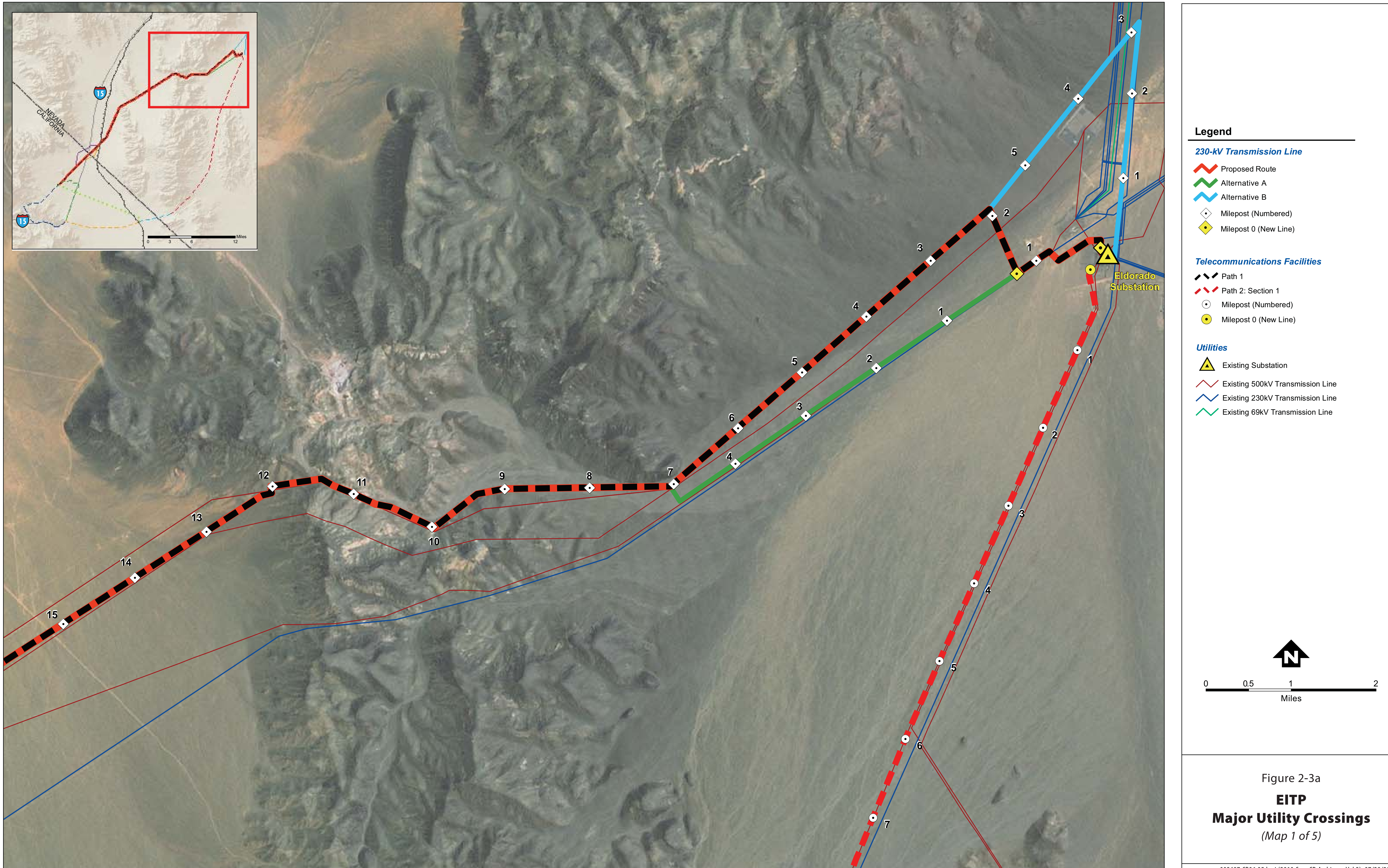

Figure 2-3a

EITP
Major Utility Crossings
(Map 1 of 5)

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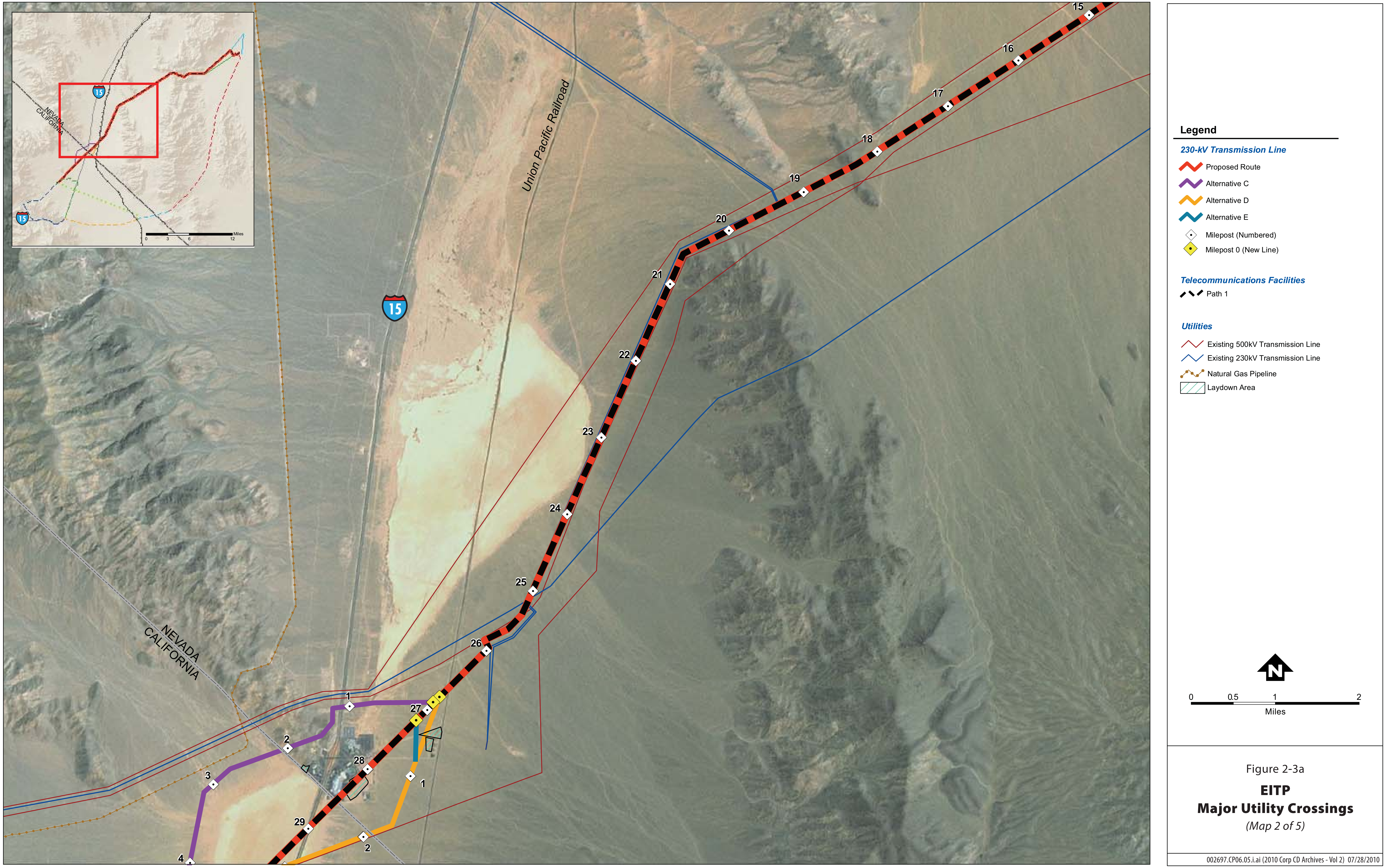

Figure 2-3a

EITP

Major Utility Crossings

(Map 2 of 5)

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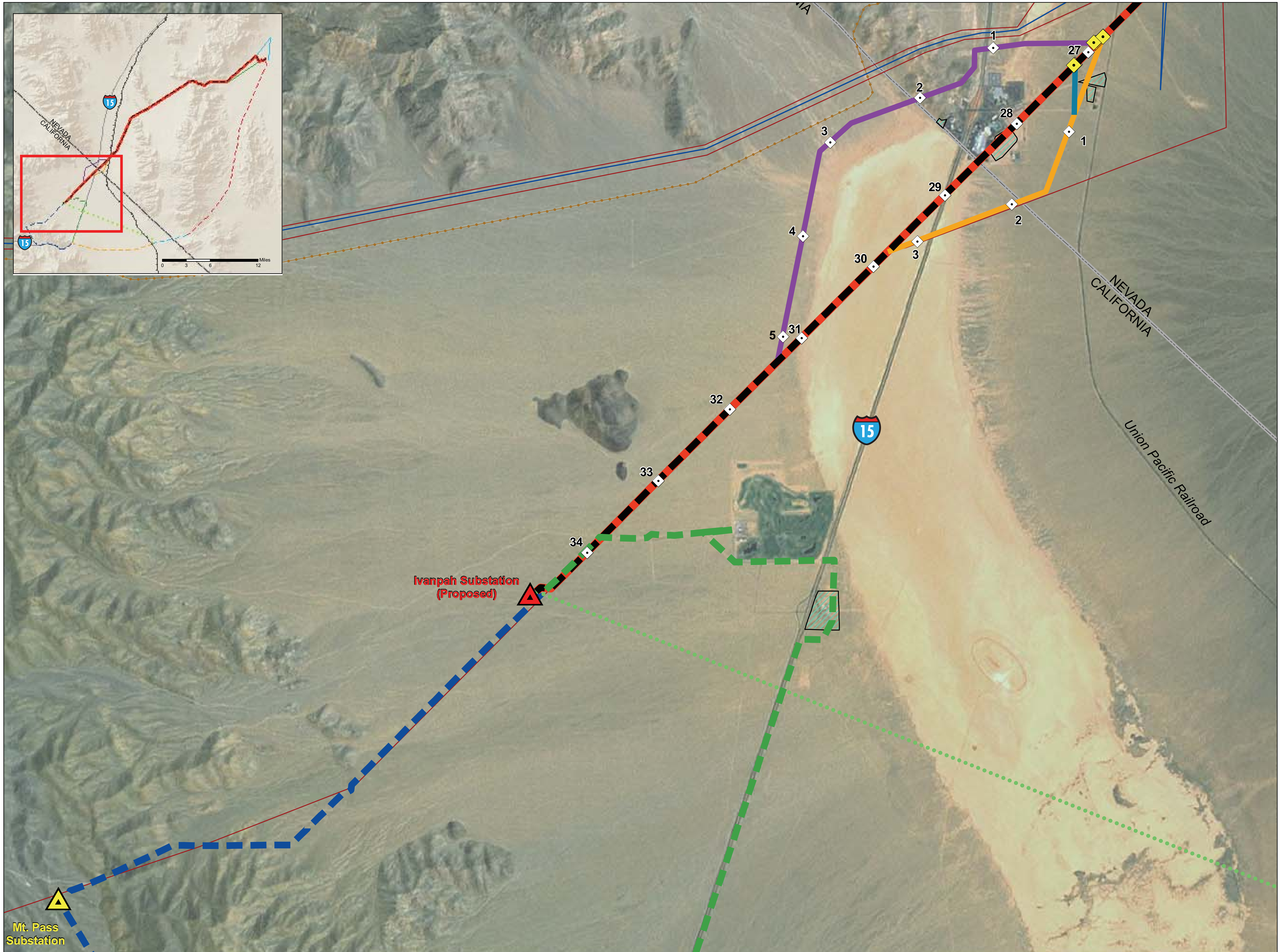

Legend

230-kV Transmission Line

- Proposed Route
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 3: Golf Course Alternative
- Path 2: Section 3: Mountain Pass Alternative
- Path 2: Section 3: Microwave Path *(proposed project)*

Utilities

- Proposed Substation
- Existing 500kV Transmission Line
- Natural gas pipeline
- Laydown Area

N

0 0.5 1 2
Miles

Figure 2-3a

EITP
Major Utility Crossings
(Map 3 of 5)

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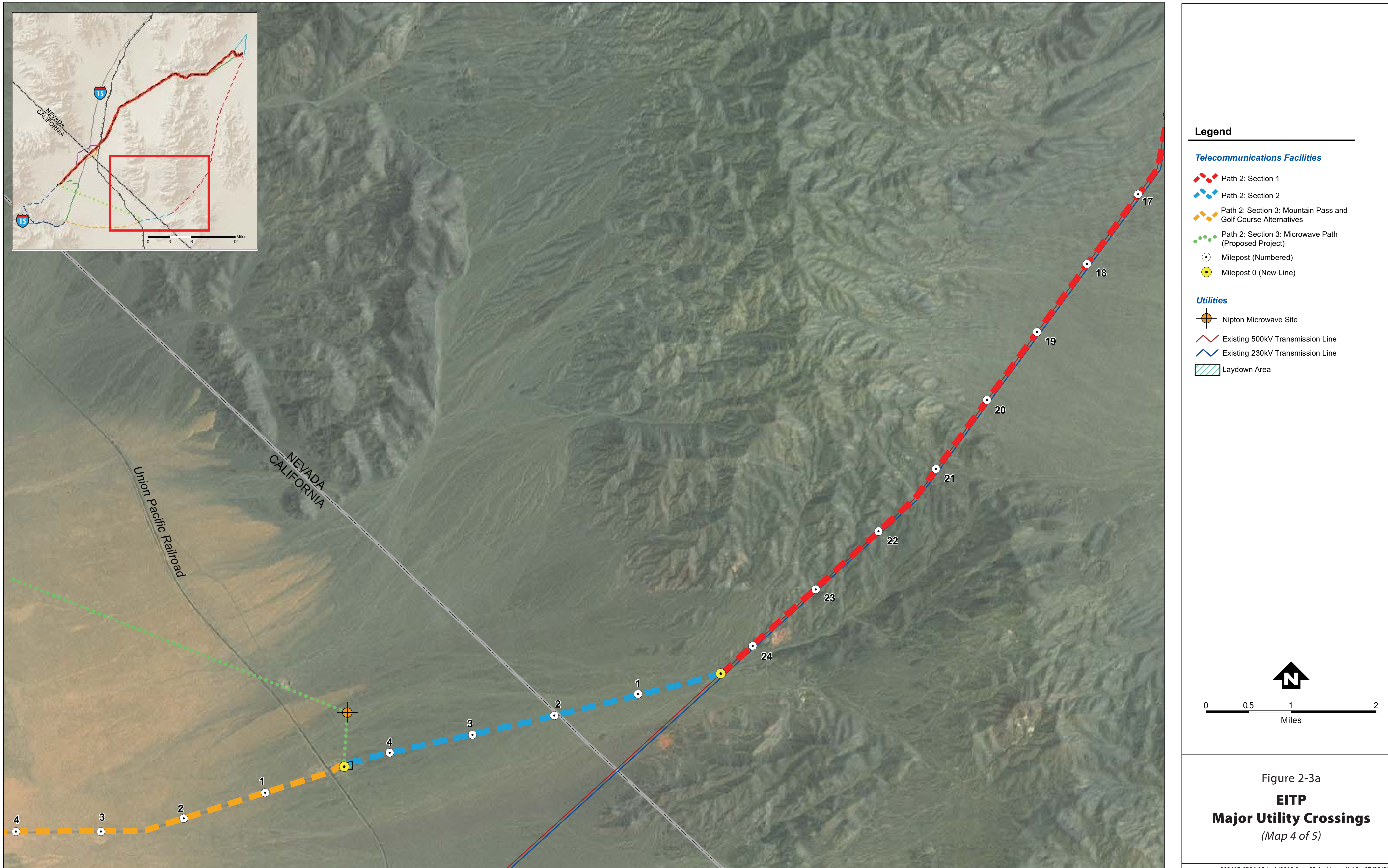

Figure 2-3a

EITP
Major Utility Crossings
(Map 4 of 5)

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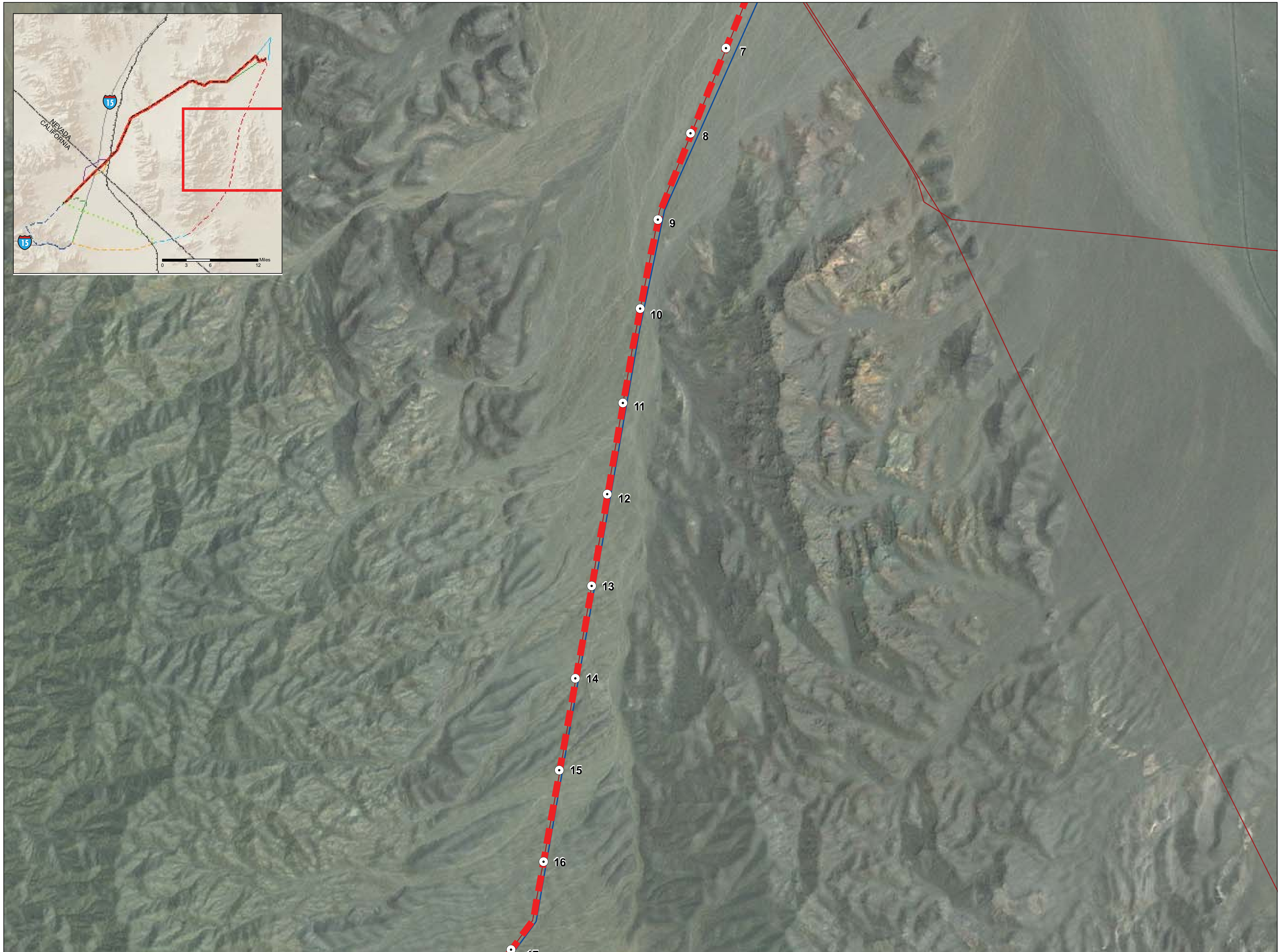

Legend

Telecommunications Facilities

Path 2: Section 1

Milepost (Numbered)

Utilities

Existing 500kV Transmission Line

Existing 230kV Transmission Line

N

0 0.5 1 2

Miles

Figure 2-3a

EITP

Major Utility Crossings

(Map 5 of 5)

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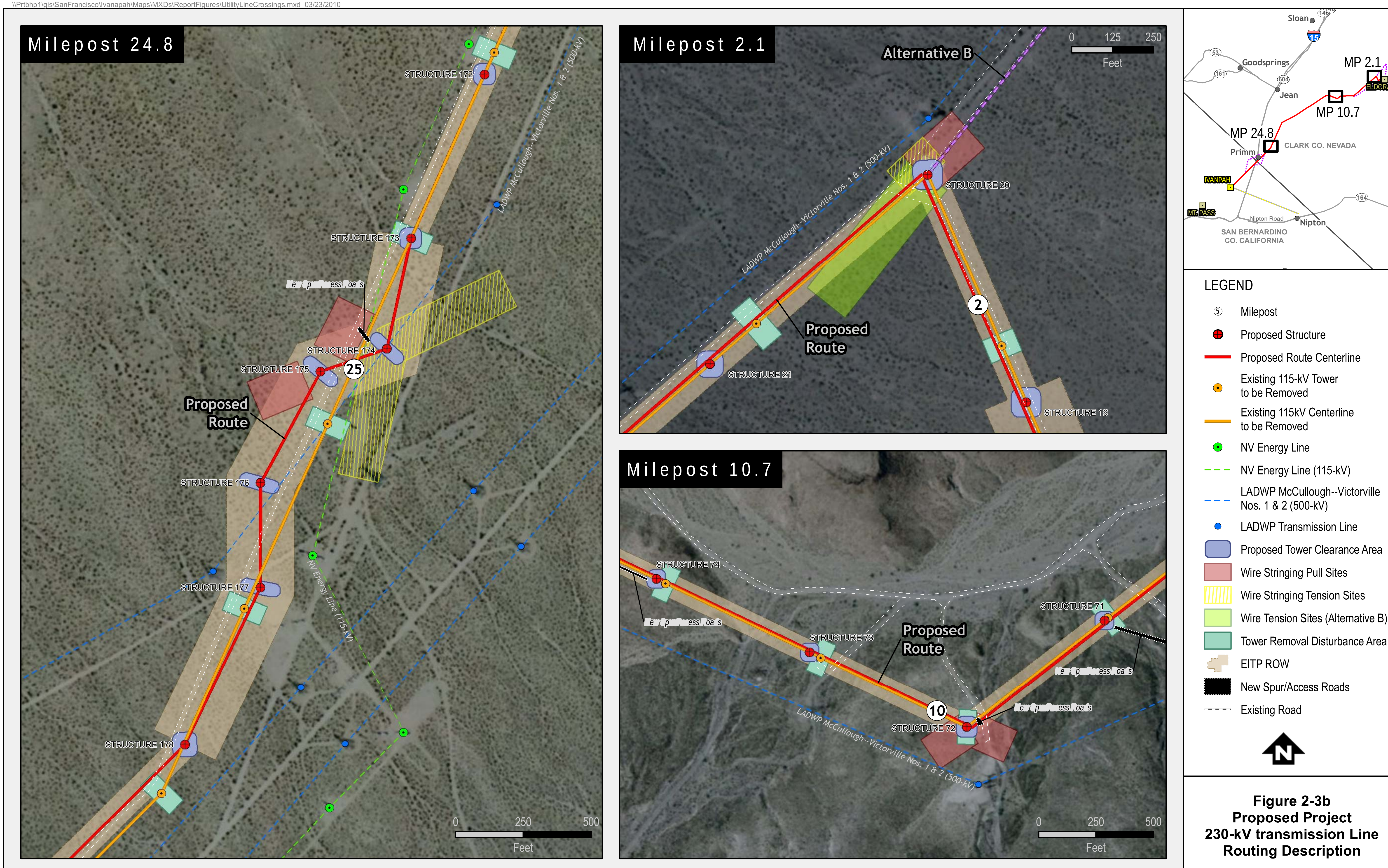

Figure 2-3b
Proposed Project
230-kV transmission Line
Routing Description

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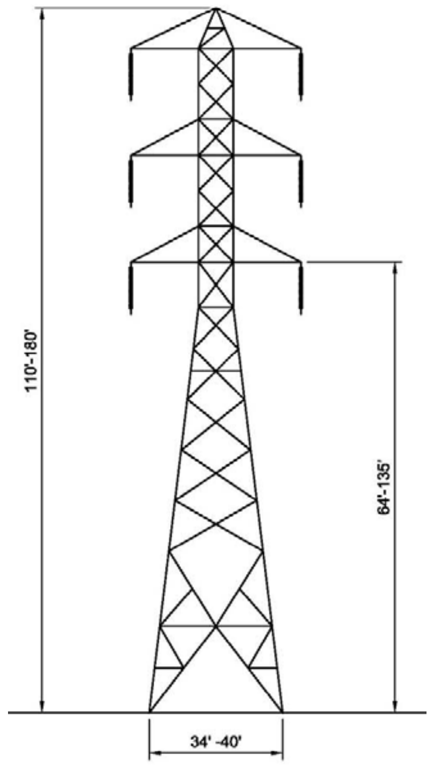


Figure 2-4 Double-Circuit 230-kV Lattice Steel Tower

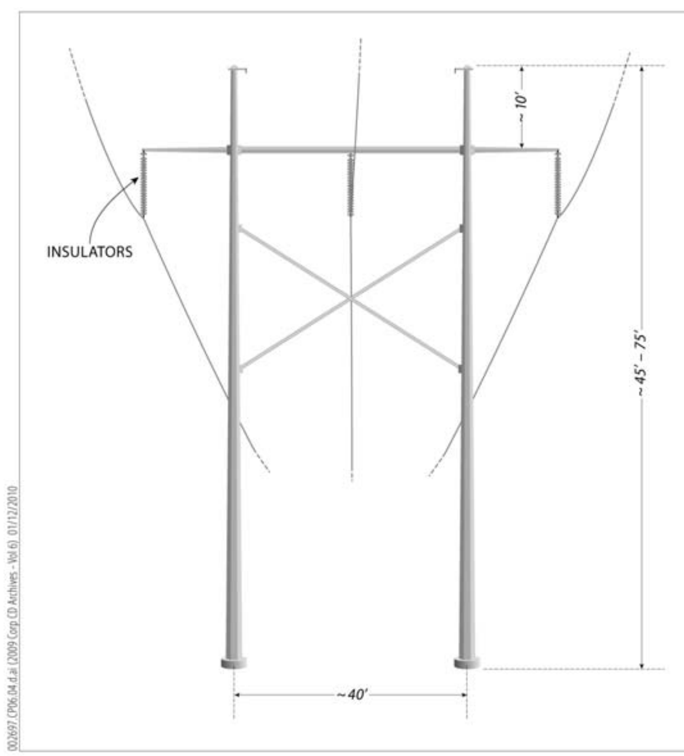


Figure 2-5 Single-Circuit 230-kV H-Frame Structure

Sections of the proposed EITP transmission line route, especially the segment between MP 24 and 28.5, would be located near or within the Ivanpah Airport Environs Overlay and would abut the proposed Southern Nevada Supplemental Airport (SNSA) site around MP 26. The SNSA is currently under environmental review; however, the applicant would be required to consult with the Federal Aviation Administration (FAA) on lighting of EITP structures and any additional safety recommendations, in compliance with FAA Part 77 regulations (see Section 3.7, “Hazards, Health, and Safety”).

Transmission Structures and Lines

The proposed EITP 230-kV transmission line would consist of 258 galvanized transmission structures that would support a double-circuit transmission line (two arrays of conductors) at the top. Each circuit would be composed of three phases (three separate cables), each phase consisting of two conductors with a cross section of 1,590 kilo circular mils (kcmil). A 1,590 kcmil conductor is approximately 1.5-inch diameter.~~; a circular area with an approximately 1.26-inch diameter)~~.[3] The conductors are commonly made of aluminum strands with internal steel reinforcement. In addition, the proposed transmission structures would have an optical ground wire and suspended single polymer insulators installed at the top, to provide protection and to support telecommunication.

LST and steel H-frame structures (Figures 2-4 and 2-5, respectively) would be the main types of transmission structures used for the proposed project, as shown in Table 2-4. The proposed structures’ heights are comparable to the heights of the structures used for the surrounding existing utilities. Where needed, the applicant would reduce structure heights to cross other utilities while maintaining proper clearances. These new structures would replace approximately 250 of the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV line structures (Table 2-5).

Table 2-4 Estimated Number and Type of Proposed New Transmission Structures

Type of Structure	Height (feet)	Number
Double-Circuit Lattice Steel Towers	110 to 180	216
Single-Circuit H-Frame Structures	45 to 75	42
TOTAL		**258**

Source: SCE 2009

Table 2-5 Existing 115-kV Transmission Structures to be Replaced by the Proposed Project

Type of Structure	Number
Lattice H-frame suspension dead end towers	150
sso iate on ete footings	1
Lattice H-frame with two storm guys	2
sso iate on ete footings	4
Lattice H-frame with four storm guys	19
sso iate on ete footings	26
Lattice H-frame with six storm guys	5
sso iate on ete footings	1
Four-legged lattice structures	13
Wood pole H-frame structures set in CMP	23
Wood pole structures set in CMP	5

[3] A circular mil (cmil) is a standard unit used in electrical systems for referring to the area of the cross section of larger conductor sizes. A mil is 0.001 inch. One cmil is equal to the area of a circle with a 1 mil diameter (Blume 2007). One kcmil is equal to one thousand cmils.

Table 2-5 Existing 115-kV Transmission Structures to be Replaced by the Proposed Project

Type of Structure	Number
Single steel cable hardware	1
TOTAL	**250**

Source: SCE 2009
Key: CMP = corrugated metal pipe; kV = kilovolt

As mentioned above, sections of the proposed EITP 230-kV transmission line, especially between MPs 24 and 28.5, would be close or within the Ivanpah Airport Environs Overlay for the SNSA, currently under environmental review. Therefore, the applicant is required to consult with the FAA on lighting of the proposed transmission structures and additional safety recommendations, in compliance with FAA Part 77 regulations (see Section 3.7, "Hazards, Health, and Safety").

California and Nevada Electrical Standards

At MP 28.5 (near tower 195), the new 130-foot ROW would cross from Clark County, Nevada, into San Bernardino County, California. All of the transmission line located within California would be designed to General Order 95 standards. All of the transmission line located within Nevada would be designed to National Electric Safety Code standards.

Subtransmission Line

A new 600- to 800-foot section of 115-kV line would be strung from a connection point at MP 34 on the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV line to a new rack position at the proposed Ivanpah Substation, to create the Cool Water–Baker–Dunn Siding–Mountain Pass–Ivanpah 115-kV subtransmission line (Figure 2-6).

Seven existing H-frame lattice structures would be removed and replaced with one TSP and six lightweight steel (LWS) H-frames (Figures 2-7 and 2-8). Six additional LWS H-frames would be installed between these structures. The structures would be approximately 60 to 75 feet tall and span 150 to 450 feet, depending on the local topography. In addition, approximately 300 feet of new spur roads would be required to access these structures.

The existing conductors would be removed and replaced with approximately 654 Aluminum Conductor Steel Reinforced (ACSR) conductors with two 4/0 ACSR 3/8-inch high-strength galvanized shield wires. The new Cool Water–Baker–Dunn Siding–Mountain Pass–Ivanpah 115-kV subtransmission line would have one conductor per phase and three phases per circuit.

Distribution Lines

Additional 33-kV distribution ~~line~~ circuitry would be installed to provide reliable lighting and power service to the new Ivanpah Substation. This component would consist of approximately 400 feet ~~1 mile~~ of new underground ~~33-kV circuitry~~ ducts from the existing Nipton 33-kV distribution line. Also, approximately 4,800 feet of new underground and 1,600 feet of new overhead 33-kV lines and two new Remote Control Switches ~~that~~ would be installed adjacent to Densmore Drive at the California state line, near Primm, Nevada to improve reliability of the circuitry that would serve the proposed Ivanpah Substation. One of the switches would be located south of the Ivanpah Substation and the second would be located next to the Primm Valley Golf Club's Desert Course.

In addition, approximately 4,300 feet of a new 33-kV ~~12-kV~~ overhead line would be installed between the town of Nipton and the new microwave site proposed to be located northeast of Nipton. A transformer would be installed on this overhead line connecting to the microwave site using an underground duct. The line would be installed along the side of an existing unnamed dirt road.

Access Roads

The applicant has proposed constructing an access road along the transmission line that would be used to haul construction materials overland to the project site. The road system proposed includes spur roads to individual towers where the access road would need to deviate from the transmission line due to topographic constraints. The access and spur road system would be maintained over the life of the facility to be used for maintenance of the transmission line. In general, access and spur roads are dirt roads that are at least 14 feet wide (7 feet from the road centerline). Access roads follow the transmission ROW. Spur roads branch from access roads toward the transmission structures and would be an average of 200 feet long.

Existing access roads would be used to construct the project, but some might require improvements or upgrades to allow passage of construction vehicles. There are approximately 35 miles of existing main access roads. The existing access road along the 115-kV transmission line provides the necessary access to construct the majority of the proposed project, and there would be no need to alter current route designations (BLM 1980; BLM 2010); however, 1.2 miles of new access roads would be needed in Nevada. In addition, longer or slightly wider spur roads might be needed at some locations. Depending on the site~~, spur roads might require grading or need to be re-developed. Approximately 1.2 miles of new spur roads would be required for the proposed project route, disturbing approximately 2.1 acres~~ some might require grading or redevelopment. Approximately 1.7 miles of new permanent spur roads would be required. In California, only one approximately 300-foot spur road would be constructed to access the new Ivanpah Substation. In Nevada, several new spur roads would be constructed to access new tower locations where terrain warrants. The combined disturbance of new spur and access roads would be approximately 4.9 acres. In Nevada, OHVs are an allowable use on established roads and trails unless otherwise designated (BLM 2010).

It is anticipated that most of the spur roads constructed to accommodate new construction would be left in place to facilitate future action for operations and maintenance purposes. Roads would be used by maintenance crews and to inspect or maintain the transmission structures. These roads would be restored after construction by removing loose rock and slide material to construct dikes, fill washouts, or flatten fill slopes, and by filling or repairing all washouts, ruts, and irregularities. The roads would be maintained to facilitate drainage and use by construction and maintenance equipment.

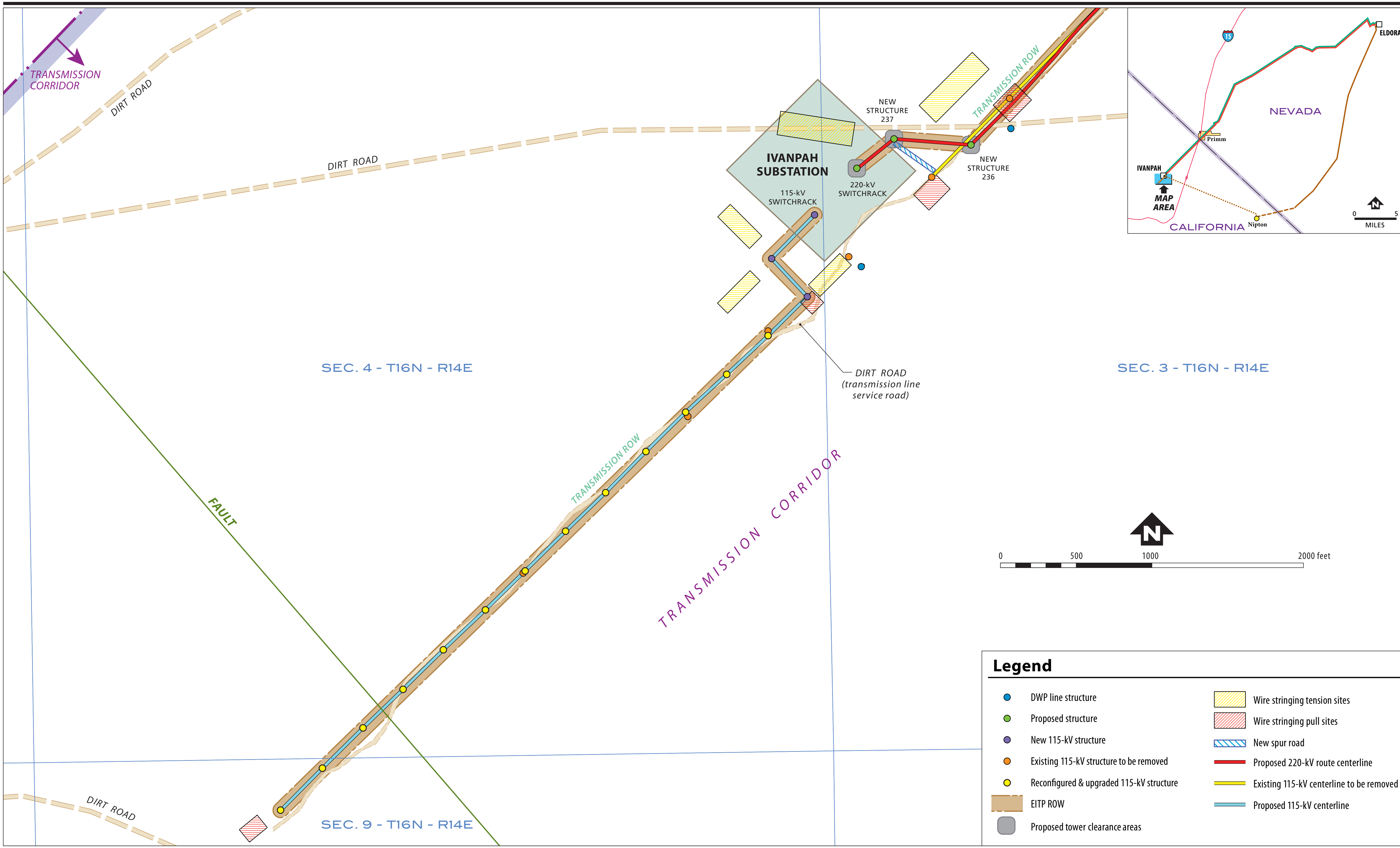
Access and spur roads would be leveled so that grades would not exceed 12 percent. Grades of approximately 14 percent would be permitted if they would not exceed 40 feet in length and were located more than 50 feet from curves or other excessive grades. All curves would have a curvature radius not less 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.

Substations

Ivanpah Substation

The proposed 230/115-kV Ivanpah Substation would be located 6.1 miles west of the California-Nevada border. The proposed substation site (Figure 2-9) area would be approximately 1,650 by 1,015 feet (38.5 acres), located within the proposed Ivanpah Solar Generating System (ISEGS) project area (see Section 2.2.2) and would consist of a 885-by-850-foot fenced area containing the transformer banks and lines, a 10-foot perimeter buffer surrounding the transformer banks, and two 1,015-by-400-foot areas (9 acres each) containing cut and fill slopes, protective drainage improvements, and substation access for all transmission lines ~~that~~ would flank the fenced area on the east and west. Ground disturbance in these areas would be limited to that needed for construction and access to the structures/poles located within the areas.

The Ivanpah Substation would be a 1,120–megavolt ampere (MVA) facility to be developed in two stages or configurations based on projected electrical transmission demand. The initial configuration would include ~~three~~ two 280-MVA 230/115-kV transformer banks, ~~five~~ three 230-kV and four 115-kV lines, and associated switchracks. The final substation configuration would be designed to include up to four 280-MVA 230/115-kV transformer banks, up to eight 230-kV lines, and up to fourteen 115-kV lines.



Ecology and Environment, Inc.

Figure 2-6 **115-kV Subtransmission Line Location**

EITP Draft EIR/EIS

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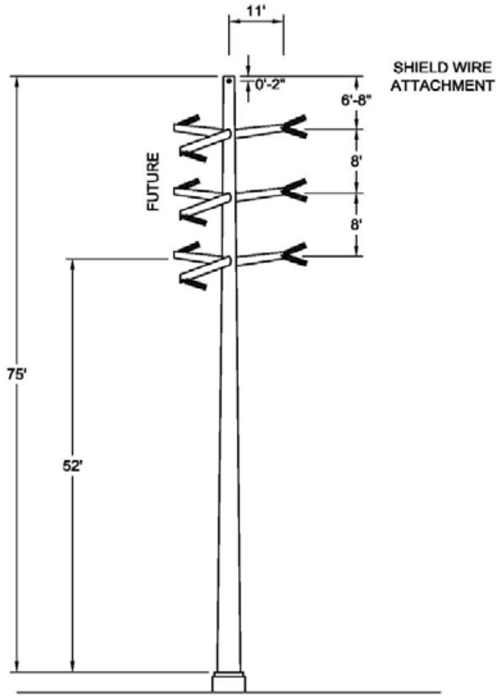

Figure 2-7 Single-Circuit 115-kV Tubular Steel Pole

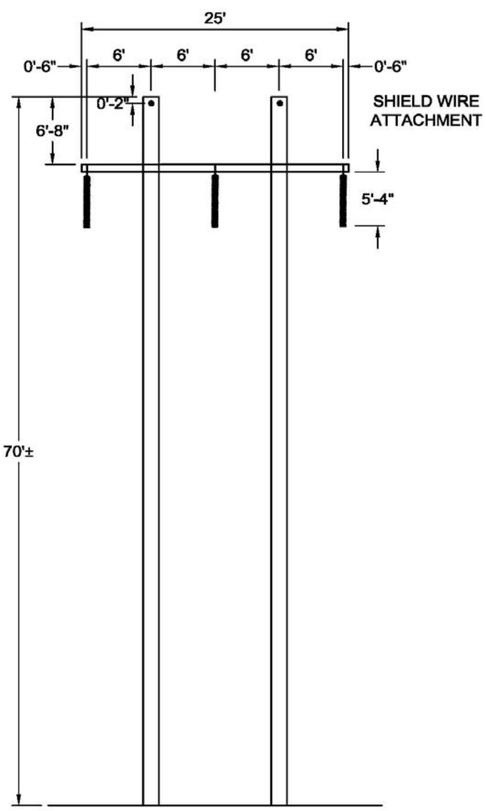

Figure 2-8 Single-Circuit 115-kV Light Weight Steel H-Frame

In addition, a 24-foot-wide paved road, fencing, areas for future 115-kV and 230-kV switchrack capacitor banks~~, and an emergency generator~~ would be installed as part of the Ivanpah Substation facility. A 180-foot microwave tower and 65-by-55-foot MEER would also be installed within the ~~southern central area of the~~ substation site[4].

Upgrades to Eldorado Substation

The existing Eldorado Substation is approximately 14 miles southwest of Boulder City, Nevada. The project would require two 230-kV line positions at the Eldorado Substation to terminate the new Ivanpah No. 1 and No. 2 230-kV transmission lines. Installation of the two positions would require that the existing 230-kV switchyard be extended ~~165 feet~~ to the west within the existing substation fence[5]. No surface grading would be required for the extension. Upgrades to existing 230-kV circuit breakers and 500-kV series capacitors might also be required. An existing 230/115-kV transformer bank would be removed.

Telecommunication System

The proposed telecommunication system, as shown in Figure 2-3, would consist of two different and redundant telecommunication paths and related facilities and equipment. This telecommunication system would allow the EITP components to operate under a Special Protection System (SPS), as required by the WECC and NERC Planning Standards (WECC 2006). An SPS detects abnormal conditions within the electric transmission system and takes corrective actions to provide an acceptable system performance, including changes in demand, generation, or system configuration to maintain system stability, acceptable voltages, and other desirable conditions.

Redundant Telecommunication Paths

WECC and NERC guidelines on SPS, also known as Remedial Action Schemes, require full redundancy—two separate and identical communication schemes or paths—to detect and alarm when essential components fail or critical functions of the transmission system are not operational, to avoid a thermal overload and/or voltage collapse of the transmission system. The purpose of redundancy is to allow removal of one circuit scheme following a failure or to allow maintenance while keeping full capability in service with the remaining scheme (WECC 2006). In addition, WECC requires redundant telecommunication circuits to be on geographically distinct routes where practical, as long as they are not subjected to the same common mode outage risk factors.

To meet the WECC requirements, the project would include construction, operation, and maintenance of two fully redundant and geographically separated telecommunication paths, Paths 1 and 2. Path 1 would be along the proposed 230-kV EITP transmission line, and Path 2 (Section 1) would be along the existing 500-kV Eldorado–Lugo transmission line. Both telecommunication paths would require installation of optical ground wire, which would provide the same grounding protection function as the overhead ground wire (protect against lightning strikes and provide ground return for faults along the transmission line) and would also provide a communication circuit via a fiber cable embedded inside the wire. The optical ground wire segments would be located at the upper section of Path 1 and Path 2 tower structures.

Telecommunication Path 1

Path 1 would require installation of approximately 35 miles of new OPGH, approximately 0.7 inches in diameter, along the new Eldorado–Ivanpah 230-kV transmission line.

[4] Final location of the MEER and microwave tower within the proposed Ivanpah Substation site will not be known until final engineering is completed.
[5] The exact distance of this extension within the Eldorado Substation site will not be known until final engineering is completed.

Source: ***Plot Plan for P.E.A.,*** Southern California Edison, June 17, 2008

Notes:
1) The footprint of the entire substation is 1,015 ft. x 1650 ft.
2) The final location for MEER and microwave tower will not be known until final engineering.

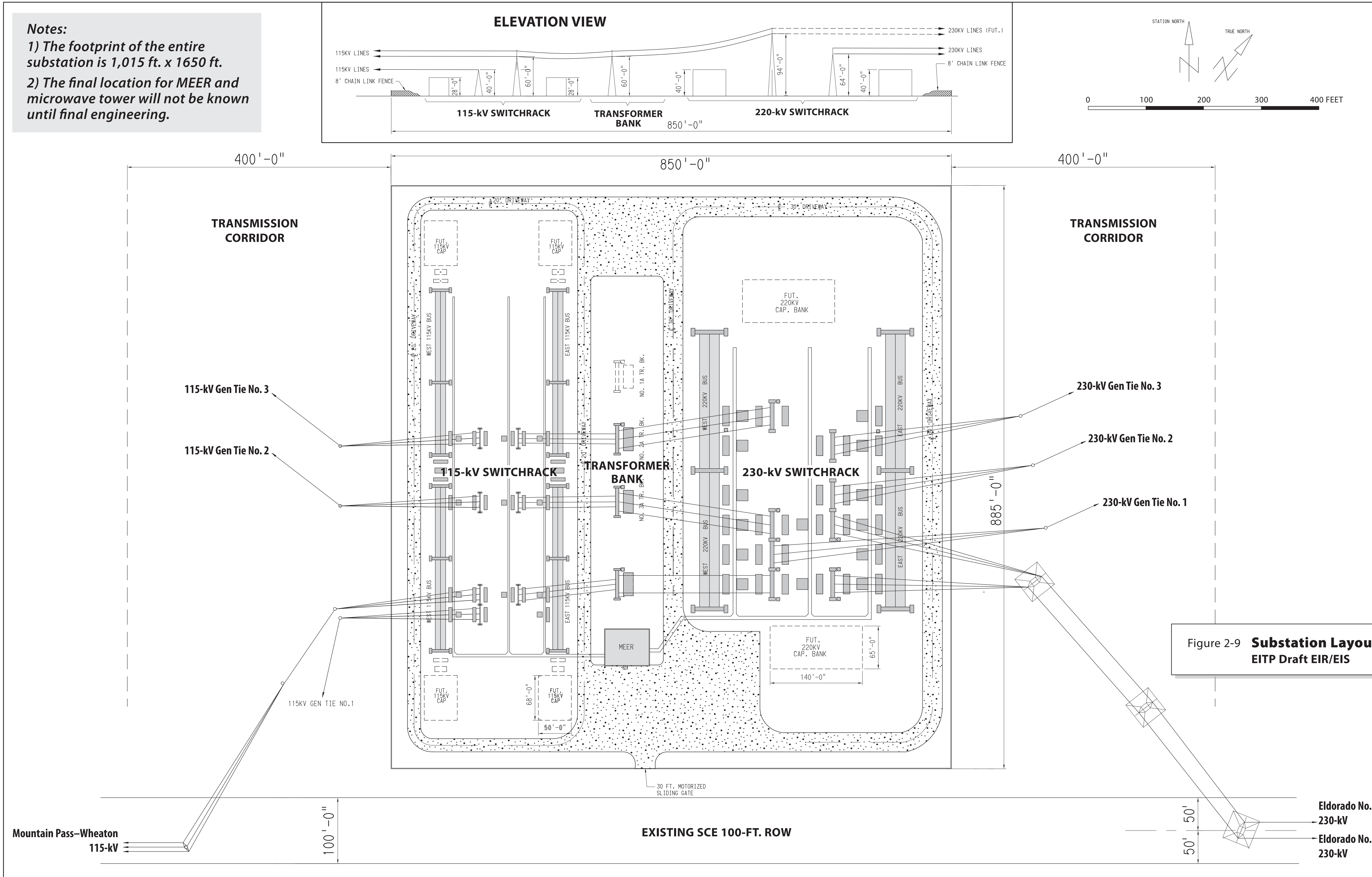

Figure 2-9 **Substation Layout**
EITP Draft EIR/EIS

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Telecommunication Path 2

Path 2 would comprise three sections. In Section 1, an existing overhead ground wire would be replaced with new optical ground wire on an approximately 25-mile section of the existing Eldorado–Lugo 500-kV transmission line. In Section 2, approximately 5 miles of fiber optic cable would be installed in an underground duct from the Eldorado–Lugo transmission line to the town of Nipton. Section 3 would provide microwave telecommunication transmission from a new communication site proposed to be located in Nipton to the proposed Ivanpah Substation.

Section 1

The Path 2, Section 1 route would extend from the Eldorado Substation to a 500-kV tower (MP 152, tower 2) of the existing Eldorado–Lugo 500-kV transmission line near the intersection of Highway 164 and the 500-kV ROW. Approximately 25 miles of the existing Eldorado–Lugo 500-kV transmission line would have one of the two existing 0.5-inch steel overhead ground wires replaced with optical ground wire.

Approximately 45 of the existing structures along this route would require some form of structural modification, at either the static peak or the mid to upper body or both, to accommodate the replacement of the overhead ground wire with optical ground wire. The exact number of structures and the specific type of modifications would be determined when final engineering had been completed. All construction work for the structure modifications would be performed within the existing access road and ROW.

Section 2

The Path 2, Section 2 route would extend in an underground duct from the Eldorado–Lugo 500-kV transmission line tower (M152-T2) to the town of Nipton. Tower M152-T2 is 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. According to the applicant's general construction practice, the underground fiber duct would be installed approximately 3 feet from the edge of the Highway 164 pavement.

Section 3

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 by 100 feet. The Path 2, Section 3 fiber cable would extend from the town of Nipton in an underground duct that would terminate at the communication site. At the Ivanpah Substation, another microwave tower (also approximately 180 feet tall) would be built to link to the Nipton microwave tower. In addition, 4,300 linear feet of the 33-kV ~~12-kV~~ overhead distribution line would be extended from the existing 33-kV ~~12-kV~~ Nipton line ROW to the proposed microwave site to provide electrical service. The applicant anticipates that only one pole with conductor span would need to be replaced.

Telecommunication at the Eldorado Substation

New telecommunication infrastructure would be installed in the Eldorado Substation to provide a protective relay circuit, a supervisory control and data acquisition (SCADA) circuit, data services, and telephone services to the Ivanpah Substation.

2.2.2 Whole of the Action Description (CEQA)/Cumulative Action (NEPA)

As discussed in Section 1.1.2, under both CEQA and NEPA, the lead agency is required to assess all environmental impacts that would occur as a result of the proposed project or action; both CEQA and NEPA stipulate that assessment is not limited to only the project components as defined in a single permit application.

Under CEQA, "project" is defined as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment" (CEQA Guidelines 15378(a)). The CEQA Guidelines also state that the "project" may require several discretionary approvals by governmental agencies and that each separate governmental approval does not necessarily constitute a separate project (CEQA Guidelines 15378(c)).

Under NEPA, related actions can be considered in an environmental document as connected actions, cumulative actions, or similar actions. BLM has determined that the ISEGS project constitutes a cumulative action, as explained in Section 2.2.2.1 (below) and Section 1.1.2.2, "NEPA Cumulative Action." NEPA regulation requires that the federal agency consider in the same environmental impact statement the proposed action and other connected or cumulative actions (40 CFR 1508.25). An agency may, but is not required to consider other similar actions in the same environmental document.

This section presents a "whole of the action" description, which comprises a summary of renewable energy projects proposed to be developed in the Ivanpah Valley area that could be considered within the scope of the proposed EITP ~~would be directly related to the proposed project~~. Because many of the renewable generation projects in the Ivanpah Valley area are being developed, applied for, and analyzed under CEQA and/or NEPA concurrently with the proposed EITP, their status and the level of publicly available information varies. For this reason, the level of detail and the consideration under CEQA and NEPA varies.

2.2.2.1 Additional ~~Related~~ Renewable Energy Projects

As defined in Section 1.2, the purpose and need for the EITP is to connect renewable generation sources in the Ivanpah Valley area to the existing electrical transmission grid, and to enable SCE to comply with California's Renewables Portfolio Standard (RPS). To date, three proposed renewable generation ~~projects~~ sites to be developed under a single project are directly related to the proposed EITP and recently approved by governmental agencies~~currently under review for discretionary approvals by governmental agencies~~. These ~~projects~~ sites—Ivanpah 1, 2 and 3—are all part of the ISEGS, a proposed solar-thermal electricity generation facility located on public lands managed by the BLM in San Bernardino County, California. The ISEGS project ~~is currently under review at the BLM and the CEC~~ was approved by the BLM in the Record of Decision (ROD) and by the CEC under Docket 07-AFC-05, and has executed Purchase Power Agreements (PPA) with electric utilities, including the applicant, to connect the proposed solar generation to the proposed EITP facilities. Based on the existence of specific contractual terms within three signed PPA and the initiation of an agency environmental/permit review on the ISEGS project, the CPUC and the BLM determined that the ISEGS project constitutes a reasonably foreseeable physical change in the environment and should be analyzed as part of the Whole of the Action (pursuant to CEQA) and as a Cumulative Action (pursuant to NEPA).

Other renewable generation projects planned in the Ivanpah Valley Area may connect to the EITP as well, including the projects listed in Table 1-1. Unlike the approved ISEGS project, these projects are not considered part of the Whole of the Action under CEQA or as a cumulative action under NEPA due to their speculative nature at the time of the Draft EIR/EIS development date of December 31, 2009, as evidenced by the lack of publicly available information on their environmental design or initiation of an environmental review process and/or the lack of a signed Power Purchase Agreement (PPA) as of December 31, 2009 with any electric service provider to connect to the EITP. These projects are instead discussed in Chapter 5: Cumulative Scenario and Impacts.

The NextLight Silver State Solar Project, which would be located adjacent to the proposed EITP near the town of Primm, Nevada, is not included as part of the Whole of the Action / Cumulative Action because Nextlight had not signed a PPA as of December 31, 2009 with any service provider to connect to the EITP ~~as of December 31, 2010~~. In fact, Nextlight has signed a PPA with NV Energy to deliver a portion of the electricity that would be produced by the Silver State Solar Project to NV Energy via the existing Arden-Higgins 1&2 Transmission Line. The NextLight Silver State Solar Project is also analyzed in detail in Chapter 5 of this Final EIR/EIS. Similarly, since the First Solar Desert

Sunlight project did not have a PPA signed with the applicant as of December 31, 2009, and no environmental information has been released to date, final information about this project has not been included in the EITP environmental review.

~~The following subsections describe the features described in the Final Staff Assessment / Draft EIS (FSA/DEIS) of the ISEGS project conducted by the CEC and BLM (Application for Certification 07-AFC-5; CEC and BLM 2009). A Supplemental DEIS was published on 4/16/2010.~~

The following subsections describe the features of the approved ISEGS project described in the CEC's Final Staff Assessment / Draft Environmental Impact Statement (FSA/DEIS), FSA Addendum, Errata to the FSA, CEC's Final Decision, and BLM's Supplemental DEIS, Final EIS, and signed ROD (CEC and BLM 2009, CEC 2010, CEC 2010a, CEC 2010b, BLM 2010a, and BLM 2010b). As a result of the review process for the ISEGS project, the BLM has selected the Mitigated Ivanpah 3 Alternative—rather than the originally proposed ISEGS layout—as the Agency Preferred Alternative in the ROD. Similarly, the CEC Final Decision has certified this alternative and determined that the revised project design and its objectives are "adequately described by the relevant documents contained in the record" (CEC 2010c).Consequently, Section 2.2.2 of this Final EIR/EIS describes features of the Mitigated Ivanpah 3 as the updated proposed layout of the ISEGS project.

The BLM has determined that the ISEGS proposal qualifies as a Cumulative Action to the EITP. The ISEGS CEC FSA and BLM FEIS ~~/DEIS~~ conclude~~s~~ that the ISEGS project would result in significant or adverse impacts. Given the geographical proximity and the overlapping schedules of the EITP and the approved ISEGS project, it is reasonable to assume that the EITP, when considered in combination with ISEGS, would contribute to cumulatively significant impacts. A Cumulative Action differs from a cumulative impact in that it is considered to be part of the scope of the action; pursuant to CEQ regulation (40 CFR 1508.25(a)(2)), the ISEGS project will be discussed as part of the action within this Final EIR/EIS.

~~The BLM has determined that the ISEGS project is not a connected action. While the ISEGS project at full build-out would be dependent on the EITP because the existing transmission line without the EITP proposed line and substation upgrades would provide insufficient transmission capacity for the power generated by all phases of the ISEGS project, the EITP is not dependent on the ISEGS project. Based on planned renewable development in the Ivanpah Valley area, there is need for the EITP even if ISEGS is not constructed.~~

2.2.2.2 ISEGS Project Overview

The ISEGS project would consist of a solar-concentrating thermal power plant and related facilities proposed by BrightSource Energy, Inc.,[6] to be located in the Ivanpah Valley area in San Bernardino County, California. The proposed ISEGS site would be 6.1 miles west of the California/Nevada border.

The proposed ISEGS solar thermal power plant would comprise fields of heliostat mirrors that would transfer solar energy into boilers located on centralized power towers. Each mirror would track the sun throughout the day and reflect the solar energy to several receiver boilers. Steam turbine generators would receive steam from the receiver boilers to produce electricity. The solar field and power generation equipment would operate each morning after sunrise and shut down in the evening when insolation drops.

[6] Specifically, the ISEGS project has been proposed by Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC; and Solar Partners VIII, LLC, all subsidiaries of BrightSource Energy, Inc.

~~The applicant proposes to develop the ISEGS project in three phases designed to generate a total of 400 MW of electricity~~The ISEGS project would be constructed in three separate phases or units to generate 370 MW of solar thermal power:

- Ivanpah 1 (southernmost site) – ~~100~~120-MW capacity, approximately ~~914~~ 920 acres
- Ivanpah 2 (middle site) – ~~100~~125-MW capacity, approximately ~~921~~ 1,097 acres
- Ivanpah 3 (northern site) ~~–~~ ~~200~~125-MW capacity, approximately ~~1,836~~1,227 acres

~~The ISEGS total project footprint is estimated to be 4,073 acres. All three phases would share an administration building, an operation and maintenance building, and the Ivanpah Substation, which would be located in between Ivanpah 1 and 2 and would require approximately 25 additional acres. Additional facilities, including re-routing of an access road (Colosseum Road, also known as Densmore Road), and natural gas, water, and transmission lines would require an additional 56 acres, while an additional 321 acres would be needed for construction staging activities.~~

The ISEGS total project footprint is estimated to be approximately 3,600 acres (or 5.6 square miles). All three phases would share a 377-acre Construction Logistics Area (CLA) located between Ivanpah 1 and 2, which would include area needed for construction staging activities and also common facilities such as an administration building, an operation and maintenance building, the Ivanpah Substation, access road, and reconductored transmission lines. Additional facilities also include natural gas, water, and connection to transmission lines. Approximately 92 percent of the overall footprint would be disturbed for the long term. Areas of temporary disturbance (e.g., temporary construction staging areas within the CLA) could potentially have fencing removed and be restored according to the facility's approved Closure, Revegetation, and Rehabilitation Plan. Areas that would be avoided (e.g., 59 acres of Succulent Nursery Area and 7 acres of Rare Transplantation Area, and other designated as "mitigation" areas) would be also considered as part of the project footprint.

The aforementioned description refers to the revised ISEGS proposed project layout, as modified by the approved Mitigated Ivanpah 3 Alternative. On February 12, 2010, the ISEGS applicant filed a "Biological Mitigation Proposal" for the ISEGS project. The proposed Mitigated Ivanpah 3 was designed to accommodate agency and public comments to reduce impacts on botany and other biological resources by avoiding the construction of the northern-most section of the site (433 acres), as well as to reduce impacts to native and rare plants within the Construction Logistics Area (109 acres). The proposed changes on land disturbance also introduced modification in the number of components and site layout of the solar power generation units. These features are further discussed in Section 2.2.2.3, "ISEGS Project Components."

2.2.2.3 ISEGS Project Components

The proposed ISEGS project would comprise three major components: three solar power plants (Ivanpah 1, 2, and 3), transmission system interconnections, and telecommunication facilities. ~~These major components are summarized below.~~

The following description refers to the project features of the ISEGS Mitigated Ivanpah 3 Alternative, as identified and selected by the BLM and CEC during the application review process published in the BLM ISEGS FEIS and CEC Final Decision (BLM 2010b, CEC 2010b) and as approved by the BLM ROD. Key changes to the originally proposed ISEGS project as a result of incorporating the Mitigated Ivanpah 3 design include:

- Land disturbance reduction from the northern portion of the Ivanpah 3 site (433 acres);

- Reduction of the number of heliostat mirrors (40,000 fewer mirrors) and power towers (one instead of five) on the Ivanpah 3 site;
- Relocation of the power block for Ivanpah 3;
- Realignment of the boundary between Ivanpah 2 and Ivanpah 3 sites and heliostat mirror fields;
- Realignment of some roads and utilities within the project footprint;
- Relocation of the administration building and water supply wells within the CLA; and
- Avoidance of approximately 109 acres from construction use within the CLA.

Location of the proposed Ivanpah Substation would be the same as the original proposed ISEGS layout; however, the administrative building and monitoring well locations would be relocated within the proposed CLA.

Solar Power Plants

Each of the proposed ISEGS power plants would consist of three major components: heliostats mirrors, solar power towers, and power blocks. Related facilities and utilities for the proposed solar power plant would include a natural gas pipeline, water supply and discharge, air pollution control and fire protection, and access and maintenance roads.

Heliostats

A heliostat consists of two mirrors placed in portrait position. The ISEGS project ~~design calls for~~would construct one heliostat field per phase, with up to ~~214,000~~ 173,500 heliostat units for all the project phases (53,500 for Ivanpah 1, and 60,000 each for Ivanpah 2 and 3); however, some of them may not be constructed. Each mirror would be 7.2 feet high by 10.5 feet wide, providing a reflective surface of 75.6 square feet per mirror. The heliostats would be connected to each other with communication cables strung aboveground. The communications cables would transmit signals from a control system to direct the movement of each heliostat to track the movement of the sun.

Heliostats located in the northern section of a mirror array have the highest collection efficiency because the sun is predominantly in the southern horizon. Due to this overall higher effectiveness of heliostats in the northern portion of a field, the Mitigated Ivanpah 3 project design would relocate the originally proposed boundary between the Ivanpah 2 and 3 units. Therefore, the revised project design would change a large number of previously “southern field” heliostats in Ivanpah 3 to become “northern field” heliostats in the Ivanpah 2. As a result of the revised design, which includes a reduction in the number of heliostats and related equipment (e.g., steam turbines) and relocation of heliostat fields, the overall output from Ivanpah 3 would be reduced from the originally proposed 200 MW to 125 MW, but also would increase in Ivanpah Unit 2 from 100 MW to 125 MW.

Solar Power Towers

The ISEGS project would require ~~seven~~ three 459-foot-tall power towers, one each for Ivanpah 1 and 2 and ~~five~~ one for Ivanpah 3. Each solar power tower would be a metal structure designed to support a solar power boiler and efficiently move high-quality steam through a steam turbine-generator (STG) at its base. The height of the power towers allows heliostats from significant distances to accurately reflect sunlight to the receiving boiler. The receiving high-efficiency boiler is positioned on top of the power tower and converts the concentrated energy of the sun reflected from the heliostats into superheated steam. The boiler’s tubes are coated with a material that maximizes energy absorbance.

The power tower support structure would be approximately 393 feet high. The receiving boiler, which sits on top of the support structure, would be approximately 66 feet tall, including the added height for upper steam drum and protective ceramic insulation panels. Additionally, a lightning pole, required by the FAA, would extend above the top of the towers approximately 10 feet.

~~The central power tower of Ivanpah 3 would include a power block with one STG that would receive steam from five separate power tower boilers. Steam from these solar power tower boilers would be conveyed by an aboveground pipeline.~~ The single power tower proposed in Ivanpah 3 unit as part of the revised design would be located in the center of the new Ivanpah 3 layout.

Power Blocks

Each power block would be located in the approximate center of each of the three solar thermal power plant areas. The power block would include a solar power tower, a receiver boiler, an STG set, air-cooled condensers, and other auxiliary systems, including:

- Natural gas-fired start-up boiler and associated air pollution control system;
- Steam turbine generator;
- Air-cooled condenser;
- Feed-water heaters;
- De-aerator;
- Emergency diesel generator;
- Diesel fire pump;
- A 250,000-gallon raw water tank for plant use and fire fighting; and
- A water treatment system.

As a result of the revised design, the size of the steam turbines installed in the power blocks in the Ivanpah 2 and Ivanpah 3 units would be adjusted to make up for the reduction in power output caused by the elimination of 40,000 heliostats originally proposed. The power block in the Ivanpah 3 unit would be located approximately 272 feet southwest of its location in the originally proposed ISEGS layout.

Related Equipment and Facilities

Natural gas pipeline

When solar conditions were insufficient, the steam produced by solar heat would be supplemented by burning natural gas to heat a partial load of water in the boiler. Each power plant would include a natural gas-fired start-up boiler to provide additional heat for plant start-up and during temporary cloud cover.

Natural gas would be supplied to the site through a new 6-mile-long distribution pipeline ranging from 4 to 6 inches in diameter. The line would run east along the northern edge, and then south along the eastern edge of Ivanpah 3 to a metering station. From there, a supply line would extend northwest into the Ivanpah 3 power block. The main pipeline would continue along the eastern edge of Ivanpah 2 to another metering station at the southeast corner of Ivanpah 2. A branch supply line would extend northwest into the center of the Ivanpah 2 power block. From that location, the pipeline would follow the paved access road past the administration/warehouse building to the Ivanpah 1 power block. A new tap metering station of approximately 100 feet by 150 feet would be located at the Kern River Gas Transmission pipeline. ~~From there, the pipeline would extend 0.5 miles south to the northern edge of Ivanpah 3.~~ In the Mitigated Ivanpah 3 project design, the length of pipeline corridor that would exist outside the ISEGS project boundaries between the Kern River pipeline and the modified northern border of the Ivanpah 3 site is 3,911 feet.

Water supply and discharge

Water would be required to support operations (process water for the steam system, wash water for the heliostats, and potable water for domestic water needs). Groundwater would be supplied from one of two wells ~~that would be~~

~~constructed at the northwest corner of Ivanpah 1~~installed in the alluvial fan aquifer within the proposed ~~construction logistics area~~CLA. In the revised design, the wells would be located in the northern portion of the CLA, north of the transmission line and close to the Ivanpah 2 unit. After groundwater treatment and storage, water supply would be provided to e~~E~~ach of the three power blocks ~~would be connected to the groundwater wells~~ by underground water pipelines.

The ISEGS applicant estimates that project water consumption would not exceed a maximum of 100 acre-feet per year (afy) for all three solar plants combined. The water would primarily be used for washing heliostats and to replace boiler feed-water blow-down. The average annual water demands would be on the order of 77 afy allocated. ~~A water treatment system would be used, consisting of activated carbon filters, de-ionization media, and a mixed-bed polisher.~~The volume of water required to support the revised ISEGS design (Mitigated Ivanpah 3) would be reduced by approximately 18 percent, consistent with the reduction in the total number of heliostats proposed.

The groundwater would be treated in activated carbon filters, de-ioinization median, and a mixed-bed polisher to provide water of the required quality, and then directed to storage tanks.

Each power plant would have a 250,000-gallon raw water storage tank. Approximately 100,000 gallons would be usable for plant process needs and 150,000 gallons would be reserved for fire protection. Demineralized water would be stored in a 25,000-gallon storage tank. Boiler feed-water make-up water would be stored in another 25,000-gallon tank.

Air Pollution Control Practices

Air pollution emissions from the combustion of natural gas in the start-up boiler would be controlled using best available control technologies and practices, such as low-nitrogen-oxide (NO_x) burners for NO_x control and burner and control adjustments based on oxygen continuous monitoring, operator training, and proper maintenance. Particulate and volatile organic compounds (VOCs) emissions would also be minimized by using natural gas as fuel. To ensure that the systems perform correctly, continuous emission monitoring for NOx and CO would be performed. Boiler use would not exceed four hours on any given day, and average boiler use would be less than one hour per operating day. The size of the boiler used for the Ivanpah 3 unit would be reduced in approximately 50 percent as compared to the originally proposed project.

Fire Protection

The fire protection system would protect personnel and limit property loss and plant downtime in the event of a fire. All fire protection systems would be focused on the power blocks, administration/warehouse building, and other areas of active operations. The primary source of fire protection water would be the raw water storage tank to be located in each power block. Approximately 150,000 gallons from each tank would be reserved for fire protection. The project would not include any specific facilities to address potential wildland fires.

Access and Maintenance Roads

Access to the ISEGS project site would occur from the Yates Well Road exit from I-15 to Colosseum Road (also known as Densmore Road). Colosseum Road would be paved to a 30-foot wide, two lane road for a distance of 1.9 miles from the Primm Valley Golf Club to the ISEGS facility entrance. The road would be re-routed around the southern end of Ivanpah 2 before re-joining the current road to the west of the proposed facility.

Within the heliostat fields, maintenance roads would be established concentrically around the power blocks to provide access for heliostat washing and maintenance. The roads would be established between every other row of heliostats. An additional maintenance road would be established on the inside perimeter of the boundary fence.

Within each project area, a diagonal dirt road would be established to provide access to the concentric maintenance roads and the power blocks. Off-highway recreational vehicle (OHV) trails currently authorized by BLM that run through the ISEGS site (Trails 699226 and 699198) would be re-located outside of the ISEGS project boundary fence. A primary modification introduced as part of the Mitigated Ivanpah 3 design would be the locations of the re-routed portions of two OHV trails. Trail 699226 would be relocated around the outside of the facility, parallel to the northern boundary of the Ivanpah 3 unit. However, because the location of the Ivanpah 3 unit boundary would be modified (1,900 feet further south of the originally proposed location), the modified re-routing of the OHV trail would be less obtrusive as compared with the originally proposed ISEGS design.

Transmission System Interconnection and Upgrades

The ISEGS project would deliver power from Ivanpah 1, 2, and 3 via three separate 115-kV transmission generation tie lines to the proposed Ivanpah Substation, which would be located within the ~~common construction logistics area~~CLA between Ivanpah 1 and 2, and constructed and operated as part of EITP (Section 2.2.1.3). The proposed Ivanpah Substation site would be about 850 feet by 850 feet and located on an approximately 17-acre pad. The CEC's Final Decision identifies the Ivanpah Substation as the "first point of connection for ISEGS" (CEC 2010b).

Each of the ISEGS power plants would have a switchyard with a step-up transformer to increase the 13.8-kV generator output voltages to 115 kV. Each switchyard would connect to the Ivanpah Substation. The existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV line would loop in and out through the newly built Ivanpah Substation to interconnect the ISEGS project to the SCE's transmission grid. The reduced output proposed as a result of the revised ISEGS design (377 MW) would not change the locations and capacities of the required gen-tie lines, Ivanpah Substation, and switchyards with step-up transformers. Moreover, the reduction of the ISEGS output from 400 MW to 370 MW would be expected to affect the overall need for that project.

Telecommunication Facilities

The proposed Ivanpah Substation would also require the installation of new telecommunication infrastructure to provide protective relay circuit and a supervisory control and data acquisition (SCADA) circuit for the proposed Ivanpah Substation, as well as ~~together with~~ data and telephone services. The telecommunication path from Ivanpah Substation to the local carrier facility interface at Mountain Pass area consists of approximately eight miles of fiber optic cable to be installed overhead on existing poles and through new underground conduits to be constructed in the substation and telecom carrier interface point. The fiber optic cable would be installed on the existing 12-kV and 33-kV distribution line poles.

2.2.2.4 ISEGS Project Construction

The ISEGS project construction would take place over ~~approximately~~ a maximum duration of 48 months[7], following the sequence below (subject to change):

- Construction logistics area
- Ivanpah 1 and other shared facilities
- Ivanpah 2
- Ivanpah 3

[7] The CEC's Errata to March 16, 2010 FSA Addendum in Air Quality (published on April 30, 2010) states that "the project applicant plans to reduce the construction schedule from 48 months to 40 months (approximately 16% reduction)." However, the CEC Presiding Members' Proposed Decision (published on August 3, 2010) identifies an approximate duration of 48 months. The BLM FEIS (published on July 2010) also refers that although duration of the Ivanpah 3 unit construction would be substantially reduced. The duration of construction of the Ivanpah 2 unit would likely be longer than the 3 to 4 months originally proposed.

The shared facilities would be constructed in connection with the first plant construction, whether it is Ivanpah 1, 2, or 3. The overall duration of construction would be reduced under the Mitigated Ivanpah 3 design, due to the reduced number of power tower receivers and heliostats. However, although duration of the Ivanpah 3 unit construction would be substantially reduced, the duration of construction of the Ivanpah 2 unit would likely be longer than the 3 to 4 months originally proposed.

The temporary construction laydown and storage areas ~~logistics area~~ would be used temporarily for staging contractor equipment and trailers, assembly yards, storing materials, equipment laydown and wash, construction personnel parking, and assembling areas for heliostats. It would be located between Ivanpah 1 and 2~~ and would comprise approximately 377.5 acres~~, within the CLA. Following construction, most of this temporarily disturbed~~e~~ area would undergo site closure, rehabilitation, and revegetation based on an approved plan.

The facilities to be shared by all three plants would be constructed during the first plant construction phase. Prior to construction, geotechnical testing, heliostat installation tests, and heliostat load tests would be performed in each of the three plants.

Average and peak construction workforce would be approximately 474 and 959 people, respectively, including construction, supervisory, support, and construction management personnel on site.

Stormwater Management

The ISEGS project site is located on an alluvial fan that acts as an active stormwater conveyance between the Clark Mountain Range to the west and Ivanpah Dry Lake to the east. The ISEGS project would include a low-impact development stormwater design and management system, which attempts to minimize disruption to natural stormwater flow pathways by minimizing the areas of direct removal of vegetation, the areas of grading and leveling, and the amount of active management of stormwater in engineered channels, ponds, and culverts. Field investigations and stormwater modeling performed by the applicant and BLM during the DEIS process indicated that the deepest and widest stormwater drainage channels, and those expected to receive the highest volume and velocity of flow during major storm events, were those located in the northern portion of the originally proposed location of the Ivanpah 3 unit. The revised ISEGS design avoids installation of heliostat fields in the most active drainages in this area. Accordingly, the Mitigated Ivanpah 3 – by modifying the Ivanpah 3 site layout - would reduce impacts from grading, site disturbance, vegetation removal, and soil compaction as compared with the original ISEGS proposal.

Fencing

The outer perimeter of each power plant, the substation, and the administrative building would be surrounded by a security fence, which would be constructed of 8-foot-tall galvanized steel chain link with barbed wire at the top for security purposes~~, as required~~. The fence location at the northern boundary of the Ivanpah 3 unit would be relocated 1,900 feet south of the original proposed location as a result of the revised ISEGS project design.

Tortoise barrier fence would also be installed in accordance with the U.S. Fish and Wildlife Service (USFWS) guidelines in Recommended Specifications for Desert Tortoise Exclusion Fencing. The tortoise fence would consist of a 1-inch horizontal by 2-inch vertical galvanized welded wire fence as tortoise barrier. The fence would be installed to a depth of 12 inches. It would extend 22 to 24 inches above the ground surface and be integrated with the security fence.

Some ISEGS-related activities would also occur outside of the project fence, on land not included within the proposed ROW. These would include inspection and maintenance of the fence, underground utility repairs, maintenance of drainage systems, and possible installation of new stormwater drainage systems. In addition to these activities, a roadway would need to be maintained outside of the ISEGS project fence to allow vehicle and equipment access.

Waste Management

Solid waste generated during the ISEGS project construction would include approximately 280 tons of scrap wood, concrete, steel/metal, paper, glass, scrap metals, and plastic waste. All non-hazardous waste would be recycled to the extent possible and non-recyclable waste would be collected and disposed in a Class III solid waste disposal facility. Hazardous wastes would be recycled to the extent possible and disposed in a Class I or II waste facility, as appropriate. Construction and operation of the Mitigated Ivanpah 3 Alternative would generate a reduced volume of hazardous and non-hazardous wastes, as compared to the originally proposed ISEGS project. This is due to the reduced size of the project, including construction of three power towers instead of seven, and installation of 40,000 fewer heliostats.

2.2.2.5 ISEGS Operation and Maintenance

The ISEGS project operations would be supported by a variety of operational, maintenance, and monitoring activities. Operational activities within the proposed power blocks would include transmission of water and natural gas and operation of process equipment, including the natural gas-fired start-up boiler, the air emission control system, the steam turbine generator, the air-cooled condensers, and other auxiliary equipment.

Routine maintenance activities would include washing heliostat mirrors on a bi-weekly rotating basis. Washing would require the use of a truck-mounted pressure washer. Maintenance would also include removing vegetation that could interfere with mirror movement to a height of 12 to 18 inches, managing weeds, and using soil binders and weighting agents (chemicals that agglomerate and retain soil particles for erosion control) to minimize fugitive dust accumulation on the mirrors as a result of winds or vehicle traffic.

All operational wastes produced at ISEGS would be properly collected, treated, and disposed of at a Class I or II waste facility, as appropriate. Wastes would include process and sanitary wastewater, nonhazardous waste, and hazardous waste, both liquid and solid. A septic system for sanitary wastewater would be located at the administration building/operations and maintenance area between Ivanpah 1 and 2. Portable toilets would be placed in the power block areas of each of the three solar facilities and pumped by a sanitary service provider. Process wastewater from all equipment, including the boilers and water treatment equipment, would be recycled.

Hazardous materials used during operations and maintenance activities would include paints, epoxies, grease, transformer oil, and caustic electrolytes (battery fluid). Several methods would be used to properly manage and dispose of hazardous materials and wastes. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Chemicals would be stored in appropriate chemical storage facilities. Bulk chemicals would be stored in large storage tanks, while most other chemicals would be stored in smaller returnable delivery containers. All chemical storage areas would be designed to contain leaks and spills in concrete containment areas.

As a result of the revised ISEGS project design, operational procedures to be used in daily operations of Ivanpah 2 and 3 units would differ, due to the different configurations and outputs as compared with the original ISEGS proposal. A reduction in the level of effort and water consumption by 19 percent (same as the reduction in number of heliostats), as well as a 25 percent reduction in natural gas burned in the start-up boilers, would result during operations of the Mitigated Ivanpah 3 Alternative.

During operations, an estimated workforce of 90 full time equivalent personnel would be needed to staff the ISEGS facility 24 hours per day, seven days per week.

2.2.2.6 ISEGS Decommissioning

The ISEGS project estimated lifetime is 50 years. Following this estimated period, the project owner would perform site closure activities to meet federal and state requirements for the rehabilitation of the site after decommissioning.

Decommissioning and restoration would be subject to many of the same environmental protection plans required for construction, including an approved Closure, Revegetation, and Rehabilitation Plan. Under this plan, the ISEGS applicant would remove all aboveground structures and facilities to a depth of 3 feet below grade and transport them off site for recycling or disposal. Concrete, piping, and other materials existing below 3 feet in depth would be left in place. Areas that had been graded would be restored to original contours. Succulent plant species would be salvaged prior to construction, transplanted into windrows, and maintained for later transplanting following decommissioning. Shrubs and other plant species would be revegetated by collecting seeds and re-seeding following decommissioning. Similar to construction, the duration of closure would be reduced under the revised Mitigated Ivanpah 3 Alternative, due to the reduced number of power tower receivers and heliostats that would require removal.

2.3 Project Alternatives

Both NEPA and CEQA require governmental decision-makers to consider the identification and assessment of reasonable alternatives that could avoid or minimize the adverse impacts of a proposed project or action. Under CEQ regulations, federal agencies are required to explore and evaluate all reasonable alternatives to a proposed action in order to provide a clear basis for choice among options by the decision-makers and the public (Title 40 CFR Sec.1502.14). Likewise, Sections 15126.6(c) and 15.126.6(d) of the CEQA Guidelines emphasize selecting a reasonable range of feasible alternatives and assessing them adequately to allow for a comparative analysis.

In accordance with CEQA and NEPA, this Draft EIR/EIS presents a reasonable range of alternatives but does not consider every possible alternative. Discussion focuses on alternatives that could substantially avoid or lessen adverse project effects. The selected range of alternatives is intended to facilitate meaningful discussion among decision-makers and the public. In addition, this Draft EIR/EIS considers the No Project / No Action Alternative.

The CPUC and the BLM evaluated 18 potential alternatives or combinations of alternatives to determine a reasonable range of alternatives that would meet the following CEQA/NEPA requirements: feasibility, consistency with project objectives and purpose and need, and potential to eliminate adverse environmental effects. The project alternatives were organized into four major categories: (1) system, (2) transmission line routing, (3) telecommunication path routing, and (4) technology.

As a result of agency and public comments on the Draft EIR/EIS, the evaluation of System Alternatives was modified to include two separate scenarios: in-basin generation and demand-side alternative. These alternatives are summarized in Section 2.3.3 and further explained in Appendix A-1, “Alternatives Screening Report.”

Section 2.3.1 below summarizes the alternative screening process. Section 2.3.2 describes those alternatives that were carried forward for analysis in the EIR/EIS, including the No Project Alternative. Section 2.3.3 briefly describes alternatives considered but not carried forward for analysis. Lastly, Section 2.3.4 introduces the agencies’ preferred alternative for the Draft EIR/EIS. Further environmental impact analysis and comparison of alternatives carried forward in this Draft EIR/EIS are provided in Chapter 3 and Chapter 4.

2.3.1 Alternatives Screening Process

This section summarizes the information presented in Appendix A-1 of this Draft EIR/EIS. The alternatives evaluated during the screening process were identified through the CEQA/NEPA scoping process, through applicant consultation with the CPUC and the BLM early in the planning process, and through supplemental studies and consultations conducted by the CPUC and the BLM as part of the environmental review process. The alternatives considered in the screening analysis (Table 2-6) were (1) identified by the applicant as part of the PEA, (2) requested by the CEQA lead agency (the CPUC) or the NEPA lead agency (the BLM), or (3) identified by the general public and other agencies during the 30-day public scoping period in accordance with CEQA and NEPA requirements.

Table 2-6 Alternatives Considered in the Screening Analysis

Category	Alternative
System	Non-transmission Alternatives ~~System (System Alternative 1)~~
	Reconductoring (System Alternative 2)
	Lower Voltage – New 115-kV Transmission Line (System Alternative 3)
	Higher Voltage – New 500-kV Transmission Line (System Alternative 4)
	Single Circuit – New 230-kV Transmission Line (System Alternative 5)
Transmission Line Routing	Parallel to Los Angeles Department of Water and Power (Transmission Alternative Route A)
	North of Eldorado (Transmission Alternative Route B)
	North Dry Lakes Reroute (Transmission Alternative Route C)
	South Dry Lakes Reroute (Transmission Alternative Route D)
	South Dry Lakes Bypass (Transmission Subalternative Route E)
	New ROW (Transmission Alternative Route F)
Telecommunication	Golf Course Telecommunication Alternative
	Mountain Pass Telecommunication Alternative
	Microwave-only Telecommunication Alternative
Technology	Composite Core Conductor (Tech 1 – Alternative to Standard Core Conductor)
	Painted Structures (Tech 2 – Alternative to Galvanized Structures)
	Underground Construction (Tech 3 – Alternative to Overhead)
	Use of Tubular Steel Poles (Tech 4 – Alternative to LST)

Key:
kV = kilovolt
LST = Lattice steel tower

2.3.1.1 Alternatives Screening Methodology

The alternatives screening process consisted of the following steps:

- **Step 1 –** Clarify the description of each alternative to facilitate comparison
- **Step 2 –** Evaluate the advantages and disadvantages of each alternative compared with the proposed project, based on the following CEQA/NEPA criteria and requirements:
  - Project Objectives, Purpose, and Need: Does the alternative accomplish all or most of the basic project objectives as agreed upon by the CPUC and the BLM? Does the alternative meet the BLM's and the CPUC's statements of purpose and need?
  - Feasibility: Is the alternative feasible from an economic, environmental, legal, social, and technological standpoint? Are there any conflicts between the alternative and the objectives of federal, regional, state, and local land use plans, policies, or regulations for the area concerned?
  - Environmental Effects: Does the alternative avoid or substantially lessen any significant effects of the proposed project, or, conversely, would the alternative create significant effects potentially greater than those of the proposed project?
- **Step 3 –** Based on the results of Step 2, alternatives that met the CEQA/NEPA criteria were retained for full analysis in the Draft EIR/EIS. Alternatives that did not meet the CEQA/NEPA criteria were eliminated from further consideration.

2.3.1.2 Summary of Screening Results

As a result of the alternatives screening process, seven of the initial 18 alternatives were carried forward for detailed analysis in the Draft EIR/EIS. Each alternative was described in detail and a determination was made based on the advantages and disadvantages identified as part of the alternatives screening process. The results for each criterion are summarized below. Table 2-7 summarizes the results of the whole alternatives screening process. Table 2-8 compares alternatives that were carried forward for analysis in this Draft EIR/EIS with the proposed project.

Table 2-7 Results of the Alternatives Screening Process

Category	Alternatives	Retained for Further Analysis	Not Carried Forward
System	Non-transmission Alternatives ~~System (System Alternative 1)~~		X
	Reconductoring (System Alternative 2)		X
	Lower Voltage – New 115-kV Transmission Line (System Alternative 3)		X
	Higher Voltage – New 500-kV Transmission Line (System Alternative 4)		X
	Single Circuit – New 230-kV Transmission Line (System Alternative 5)		X
Transmission Line Routing	Parallel to Los Angeles Department of Water and Power (Transmission Alternative Route A)	X	
	North of Eldorado (Transmission Alternative Route B)	X	
	North Dry Lakes Reroute (Transmission Alternative Route C)	X	
	South Dry Lakes Reroute (Transmission Alternative Route D)	X	
	South Dry Lakes Bypass (Transmission Subalternative Route E)	X	
	New ROW (Transmission Alternative F)		X
Telecommunication	Golf Course Telecommunication Alternative	X	
	Mountain Pass Telecommunication Alternative	X	
	Microwave-only Telecommunication Alternative		X
Technology	Composite Core Conductor (Tech 1 – Alternative to Standard Core Conductor)		X
	Painted Structures (Tech 2 – Alternative to Galvanized Structures)		X
	Underground Construction (Tech 3 – Alternative to Overhead)		X
	Use of Tubular Steel Poles (Tech 4 – Alternative to LST)		X

Key:
kV = kilovolt
LST = Lattice steel tower

Criterion 1: Project Objectives, Purpose, and Need

Several of the alternatives are modifications to the applicant's proposed transmission line route or telecommunication paths. All the transmission route variations would meet the basic project objectives, purpose, and need, as would most of the telecommunication paths alternatives. Other alternatives to the proposed transmission system and technology would involve different project components, techniques, or materials. Although some of the technology alternatives would meet the objectives, purpose, and need, their implementation might not be feasible, or they would result in environmental impacts either the same as or more significant than those of the other alternatives.

Table 2-8 Comparison of Retained Alternatives with the Proposed Project

Category	Alternatives	Preliminary Environmental Comparison with the Proposed Project	
		Advantages	**Disadvantages**
Transmission Line Routing	Parallel to Los Angeles Department of Water and Power (Transmission Alternative Route A)	• Eliminates several transmission crossovers near Eldorado Substation • Located within BLM-designated utility corridor • Reduces impacts to cultural resources • Reduces impacts to intermittent streams	• Potential for greater habitat disturbance. The construction area west of Eldorado Substation consists of an undisturbed desert habitat • Potential for greater impact to tortoise habitat, other wildlife, rare plant species, and desert vegetation
	North of Eldorado (Transmission Alternative Route B)	• Reduces impacts to cultural resources • Reduces impacts to intermittent streams due to fewer crossings • Located within BLM-designated utility corridor	• Requires 5.3 miles of new transmission line ROW • Greater potential for ground disturbance from new transmission line ROW
	North Dry Lakes Reroute (Transmission Alternative Route C)	• Avoids crossing Ivanpah Dry Lake • Reduces visual impacts compared with the proposed project; existing transmission line would be removed and relocated and it would not be visible from nearby residential use • Reduces impacts to paleontological resources • Reduces impacts to intermittent streams due to fewer crossings	• Potential for greater impacts to desert tortoise and its habitat. This alternative has a higher quality desert tortoise habitat than does the proposed route • Potential for greater impacts to cultural resources associated with disturbance of Arrowhead Trail Highway • Requires 5.3 miles of new 130-foot ROW north of the Ivanpah Dry Lake and Primm, Nevada
	South Dry Lakes Reroute (Transmission Alternative Route D)	• Reduces overall transmission footprint on the Ivanpah Dry Lake • Reduces visual impacts compared with the proposed project; existing transmission line would be removed and relocated and it would not be visible from nearby residential use • Reduces potential for the presence of other sensitive wildlife or plant species occurring within the limits of this alternative • Reduces impacts to intermittent streams due to fewer crossings	• Potential for greater impacts to cultural resources • Potential for greater ground disturbance for new access roads • Requires approximately 3.3 miles of new ROW

Table 2-8 Comparison of Retained Alternatives with the Proposed Project

Category	Alternatives	Preliminary Environmental Comparison with the Proposed Project	
		Advantages	Disadvantages
	South Dry Lakes Bypass (Transmission Subalternative Route E)	• Similar to those identified for Alternative D	• Similar to those identified for Alternative D
Telecommunication	Golf Course Telecommunication Alternative	• Potentially reduces visual impacts for certain portions of the telecommunication line that would be located underground	• Potential for greater ground disturbance and impacts to paleontological resources due to underground construction • Underground construction has potential for greater impacts to sensitive habitat and to cultural and paleontological resources
	Mountain Pass Telecommunication Alternative	• Potentially reduces visual impacts for certain portions of the telecommunication line that would be located underground or out of line-of-sight of sensitive resources	• Greater potential for ground disturbance and impacts to paleontological resources due to underground construction • Potential for greater construction-related hazards due to transport, use, or disposal of hazardous materials and for upsets or accidents involving releases of hazardous materials

Key:
LST = Lattice steel tower
ROW = right-of-way

Criterion 2: Feasibility

The alternatives vary in their ability to meet economic, environmental, legal, social, and technical feasibility criteria. Technical feasibility issues were primarily related to physical constraints, such as engineering/design limitations for construction on steep slopes. Other alternatives had legal feasibility issues related to consistency with regulatory standards for operational reliability.

Criterion 3: Environmental Effects

Environmental impacts of each alternative were compared to evaluate overall ability to reduce or avoid significant effects. In some cases, an alternative might reduce or eliminate a proposed project effect but create a new significant impact in a different resource area.

2.3.2 Alternatives Fully Analyzed in the Draft EIR/EIS

This section summarizes alternatives that were carried forward for analysis in the Draft EIR/EIS, including the No Project Alternative. For alternatives that were eliminated from Draft EIR/EIS consideration, Appendix A-1 explains in detail the rationale for elimination.

2.3.2.1 Transmission Line Routing Alternatives

The alternatives carried forward for analysis that were minor route variations to the proposed transmission line route are called the Transmission Alternatives (Figure 2-10). 6Two of the Transmission Alternatives are near the existing Eldorado Substation and are designed to avoid an area not designated as a BLM utility corridor. Although this area contains the ROW for the existing 115-kV line, because it falls outside of a BLM-designated corridor, the applicant would need to obtain Clark County and City of Boulder City approval to widen the ROW to the 100 or 130 feet required for the upgraded 230-kV line. The alternatives have therefore been designed to parallel existing transmission ROW within the officially designated corridors.

The other three Transmission Alternatives are near Primm, Nevada, and are designed to avoid potential impacts to Ivanpah Dry Lake. All the Transmission Alternatives diverge from the proposed transmission line route for a portion of the route, but are not an entire project alternative. Major existing utilities that would cross the transmission route alternatives are shown in Figure 2-3a.

Parallel to LADWP Line Segment (Transmission Alternative Route A)

The Eldorado–Ivanpah 230-kV Transmission Alternative Route A (Figure 2-11) would begin at the Eldorado Substation. The line would leave the substation heading north, and then immediately would head west to join the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass ROW. The line would proceed generally west on a 130-foot ROW and cross three LADWP transmission lines (McCullough–Victorville No. 1, 500 kV; McCullough–Victorville No. 2, 500 kV; and Mead–Victorville, 287 kV) to the north before heading west again.

The route would then cross the LADWP 500-kV transmission line (Marketplace–Adelanto). Transmission Alternative Route A would continue west for approximately 5.0 miles on a new ROW, and then turn north for approximately 1,000 feet before crossing the LADWP Marketplace–Adelanto 500-kV transmission line again and joining the proposed project route at MP 7.

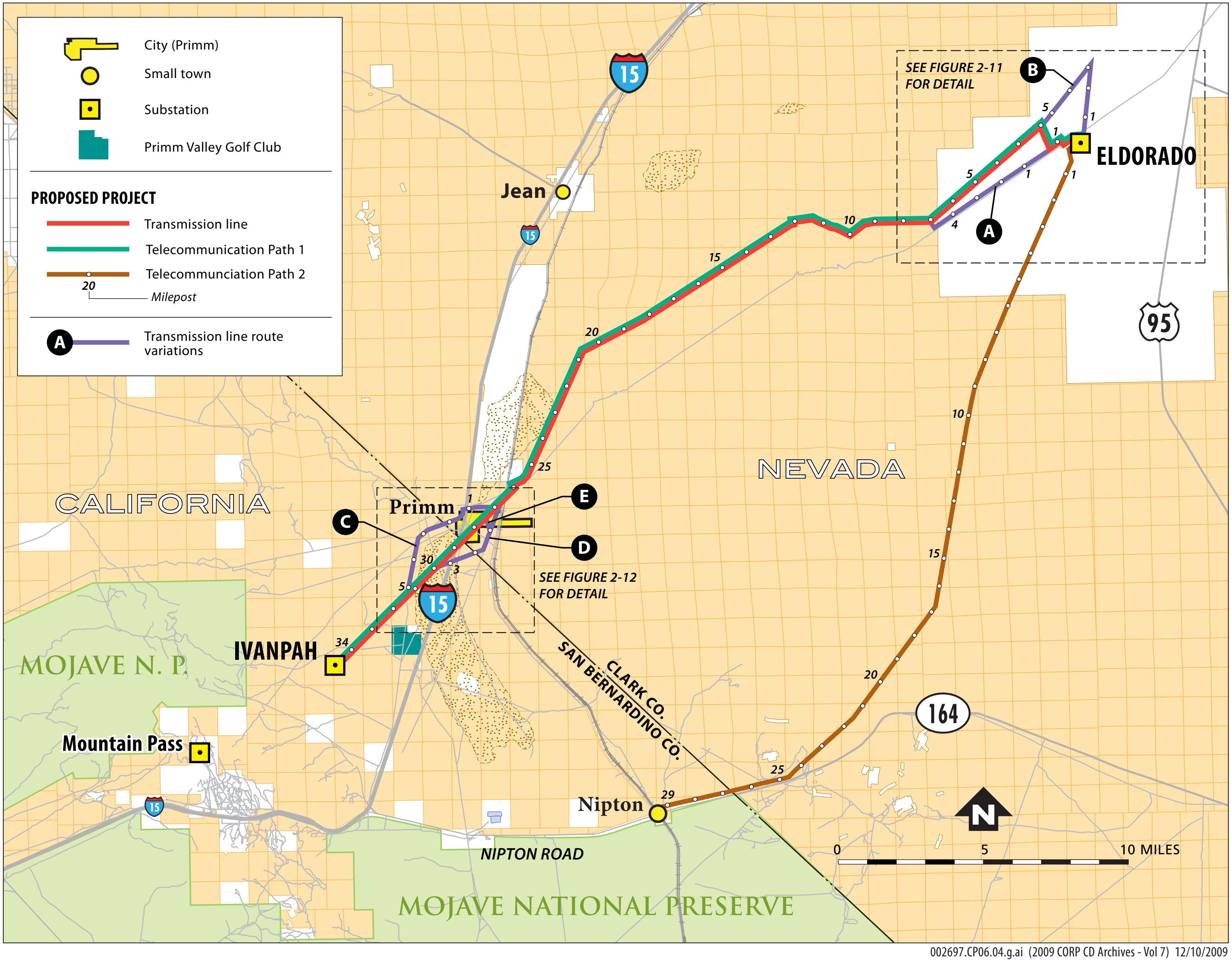

Figure 2-10

Transmission Line Routing Alternatives

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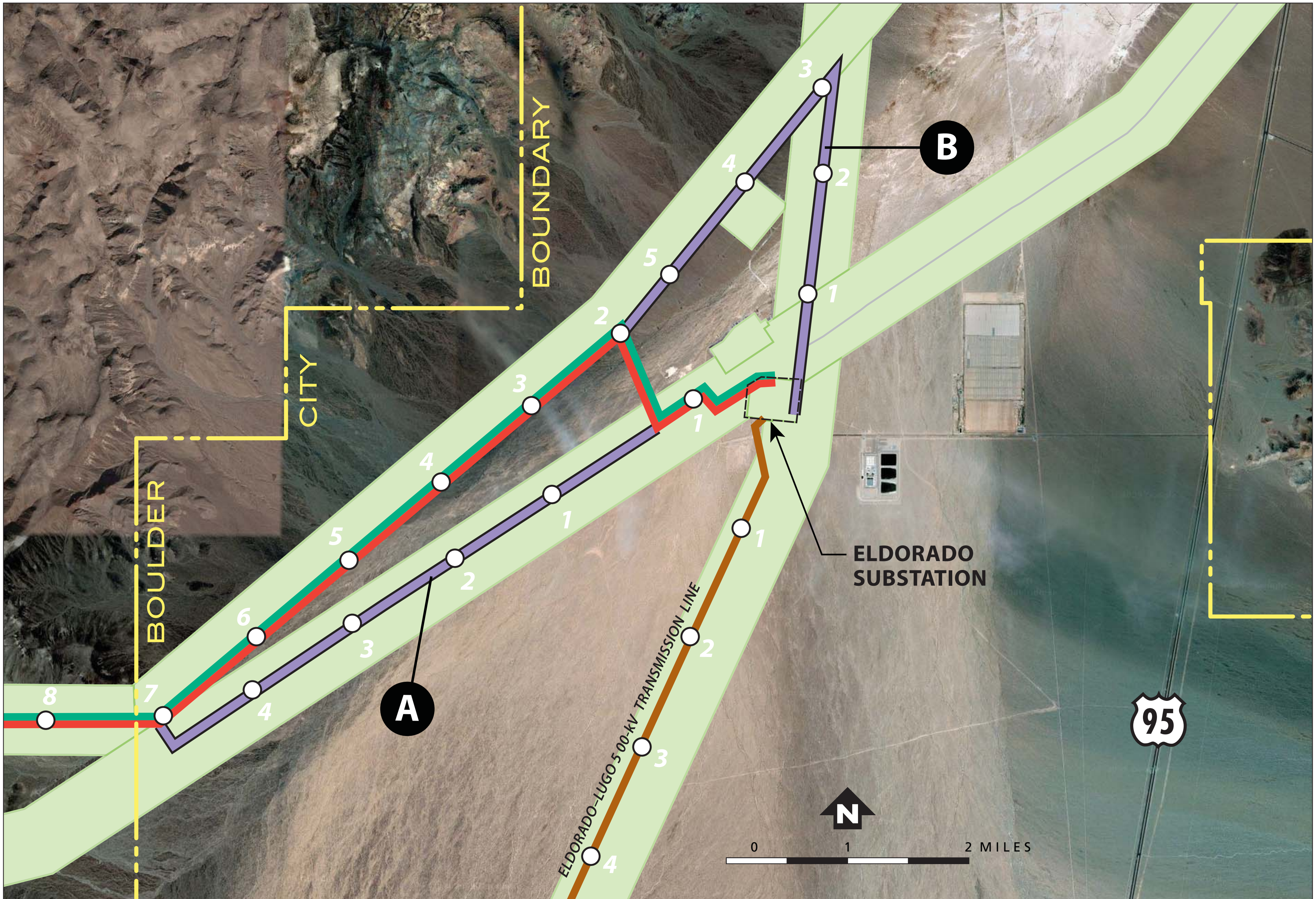

Legend

Transmission line

Telecommunication Path 1

20 — *Milepost*

E Transmission line route variations

BLM-designated energy ROW corridors

Telecommunication Path 2, Section 1

Figure 2-11

Transmission Line Routing Alternatives A and B

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The purpose of this alternative is to bypass a segment of the proposed project route where the proposed project would deviate from designated transmission corridors and would cross an approximately 0.8-mile segment within the Boulder City Conservation Easement. Although this 0.8-mile ROW currently contains the existing 115-kV line, as stated above, it falls outside of the BLM-designated corridors. Therefore, the applicant may need to obtain Clark County and City of Boulder City approval to widen the ROW to the 100 to 130 feet required for the upgraded 230-kV line. Transmission Alternative Route A would bypass this segment by heading north from the Eldorado Substation following existing designated transmission corridors.

North of Eldorado (Transmission Alternative Route B)

Transmission Alternative Route B (Figure 2-11) would begin at the Eldorado Substation. The line would exit the substation to the north and parallel the Eldorado–Mead 230-kV transmission line on existing ROW for approximately 2.5 miles before turning southwest. The route would continue southwest for approximately 2.8 miles and re-join the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line ROW at MP 2 of the proposed route. This alternative would require numerous, difficult transmission crossings, and several of these overhead utility lines would require modification or relocation to accommodate passage of the Transmission Alternative Route B transmission line.

Similar to Transmission Alternative Route A, the purpose of Transmission Alternative Route B is to bypass a segment of approximately 0.8 miles where the proposed project would deviate from existing designated transmission corridor and would cross lands administered by the City of Boulder (Boulder City Conservation Easement). Transmission Alternative Route B was created to bypass these segments by heading southwest from the Eldorado Substation to join the existing ROW.

North Dry Lakes Reroute (Transmission Alternative Route C)

Transmission Alternative Route C (Figure 2-12) would begin at the Eldorado Substation and follow the proposed route to the point where the line reaches the northeastern edge of the Ivanpah Dry Lake (MP 27, tower 185). Transmission Alternative Route C would then continue west and southwest on new 130-foot ROW around Ivanpah Dry Lake for approximately 5.3 miles before rejoining the proposed project route at MP 32, tower 218. Transmission Alternative Route C was developed to minimize potential impacts to the Ivanpah Dry Lake.

South Dry Lakes Reroute (Transmission Alternative Route D)

Transmission Alternative Route D (Figure 2-12) would parallel the existing LADWP Marketplace–Adelanto 500-kV transmission line as it crosses through the Ivanpah Dry Lake. This route would reduce the overall transmission footprint, since the EITP towers would follow to the extent feasible the existing LADWP 500-kV ROW. Transmission Alternative D begins at the Eldorado Substation and follows the proposed route until it approaches the northeastern edge of the Ivanpah Dry Lake (MP 27, tower 184). Transmission Alternative D would then continue south and then southwest on a new 130-foot ROW around Primm for approximately 3.3 miles before rejoining the proposed project route at MP 30, tower 203.

South Dry Lakes Bypass (Transmission Subalternative Route E)

Transmission Subalternative Route E is a subalternative to Transmission Alternative Route D. Subalternative E would use a shorter length of new 130-foot ROW (approximately 0.25 miles shorter than Alternative D) from MP 27 of the proposed EITP transmission line to the corridor that would parallel the existing LADWP Marketplace–Adelanto 500-kV transmission line. As would Transmission Alternative D, this route would reduce the overall transmission footprint, since the EITP towers would follow to the extent feasible the existing LADWP 500-kV ROW. Transmission Subalternative Route E would proceed south from MP 27 for approximately 1 mile and then follow the route proposed for Transmission Alternative D (Figure 2-12).

2.3.2.2 Telecommunication Alternatives

The two alternatives to the proposed telecommunication system are the Golf Course Telecommunication Alternative and the Mountain Pass Telecommunication Alternative. These alternatives include additional undergrounded segments and installation of telecommunication wires along existing distribution lines. The telecommunication alternatives were designed to minimize potential visual impacts of an aboveground microwave tower. Both alternatives would follow the same path as the proposed telecommunication route until the town of Nipton, California.

Telecommunication Alternative (Golf Course)

The Golf Course Telecommunication Alternative route would extend from Nipton to the point on the north side of Nipton Road where it intersects with I-15. This alternative would consist of a combination of all-dielectric self-supporting fiber cable installed on existing Nipton 33-kV wooden distribution pole lines and underground fiber optic cable in new duct banks (Figure 2-13).

Approximately 1 mile of all-dielectric self-supporting fiber cable would be installed overhead on an existing Nipton 33-kV distribution line immediately west of Nipton, on the north side of Nipton Road. Pole replacement for this alternative is not anticipated; however, the detailed project engineering design process might indicate that pole replacement would be necessary. From the westernmost pole on the Nipton line before it crosses Nipton Road to the south, fiber optic cable would be installed in a new underground duct along the north side of Nipton Road in new roadside ROW to the intersection of Nipton Road and I-15. The underground cable length for this segment would be approximately 9 miles.

From the I-15–Nipton Road junction, the Golf Course Telecommunication Alternative route would parallel I-15, running north on an existing Nipton 33-kV distribution line and crossing I-15 near the Primm Valley Golf Course. This alternative route would cross the Primm Valley Golf Course in a new underground duct (Figure 2-13), then continue on an existing Nipton 33-kV distribution line to a point approximately 1 mile north of the Ivanpah Substation. The telecommunication line would then be installed in a new underground duct for approximately 1 mile to the Ivanpah Substation. The entire route from the I-15 junction to the Ivanpah Substation would be approximately 10 miles.

Telecommunication Alternative (Mountain Pass)

The Mountain Pass Telecommunication Alternative route would extend from Nipton to the point on the north side of Nipton Road where it intersects with I-15. This alternative would consist of all-dielectric self-supporting fiber cable installed on existing Nipton 33-kV wooden distribution pole lines and underground fiber optic in new duct banks (Figure 2-14).

Approximately 1 mile of all-dielectric self-supporting fiber cable would be installed overhead on an existing Nipton 33-kV distribution line immediately west of Nipton, on the north side of Nipton Road. Pole replacement for this alternative is not anticipated; however, the detailed project engineering design process might indicate that pole replacement would be necessary. From the westernmost pole on the Nipton line before it crosses Nipton Road to the south, fiber optic cable would be installed in a new underground duct along the north side of Nipton Road in new roadside ROW to the intersection of Nipton Road and I-15. The underground cable length for this segment would be approximately 9 miles.

From the I-15 junction point, the route would parallel I-15 in an underground duct for approximately 1.0 mile and then would exit the underground duct and be strung on an existing Nipton 33-kV distribution line. The alternative route would then continue west to the town of Mountain Pass, then north to the Mountain Pass Substation. From there, the cable route would proceed northeast on an existing Nipton 33-kV distribution line to the Ivanpah Substation. The route would enter the proposed Ivanpah Substation from the south via approximately 500 feet of underground conduit that would be installed from the last Nipton 33-kV distribution line pole to the substation. The Mountain Pass Telecommunication route, from the I-15 junction point to the Ivanpah Substation, would be approximately 15.0 miles.

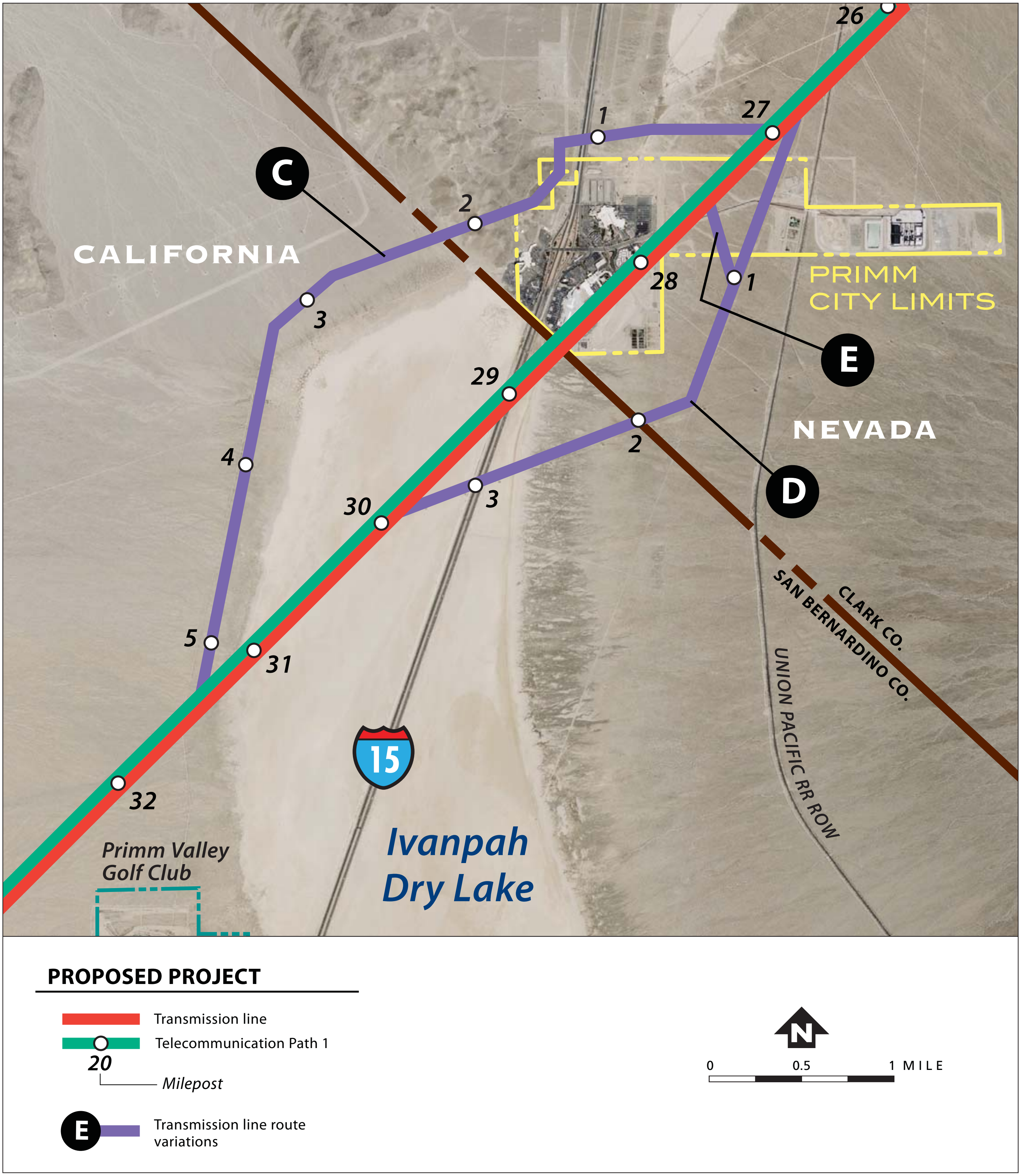

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Figure 2-12

Transmission Line Routing Alternatives C, D and E

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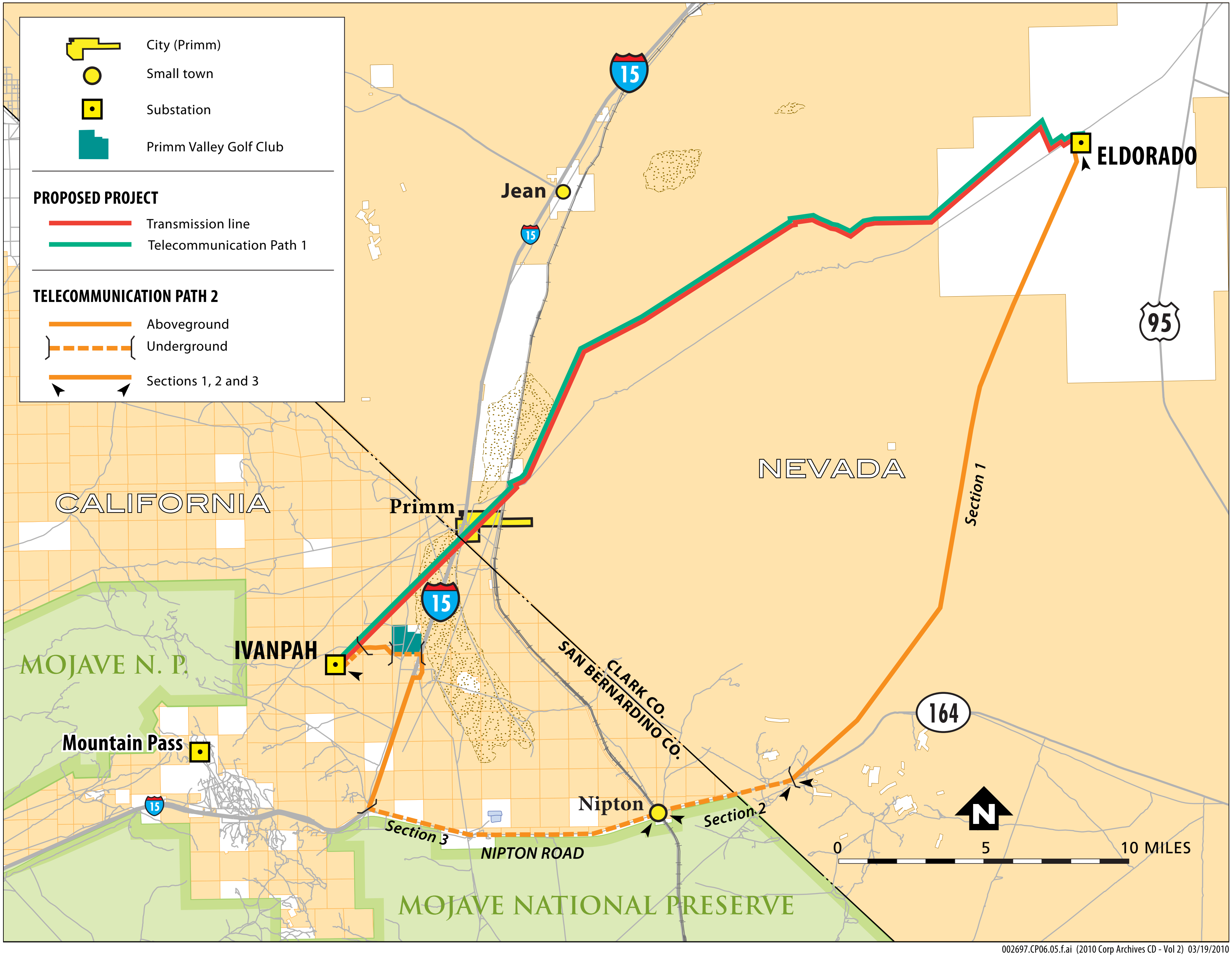

Figure 2-13 **Golf Course Telecommunication Alternative**

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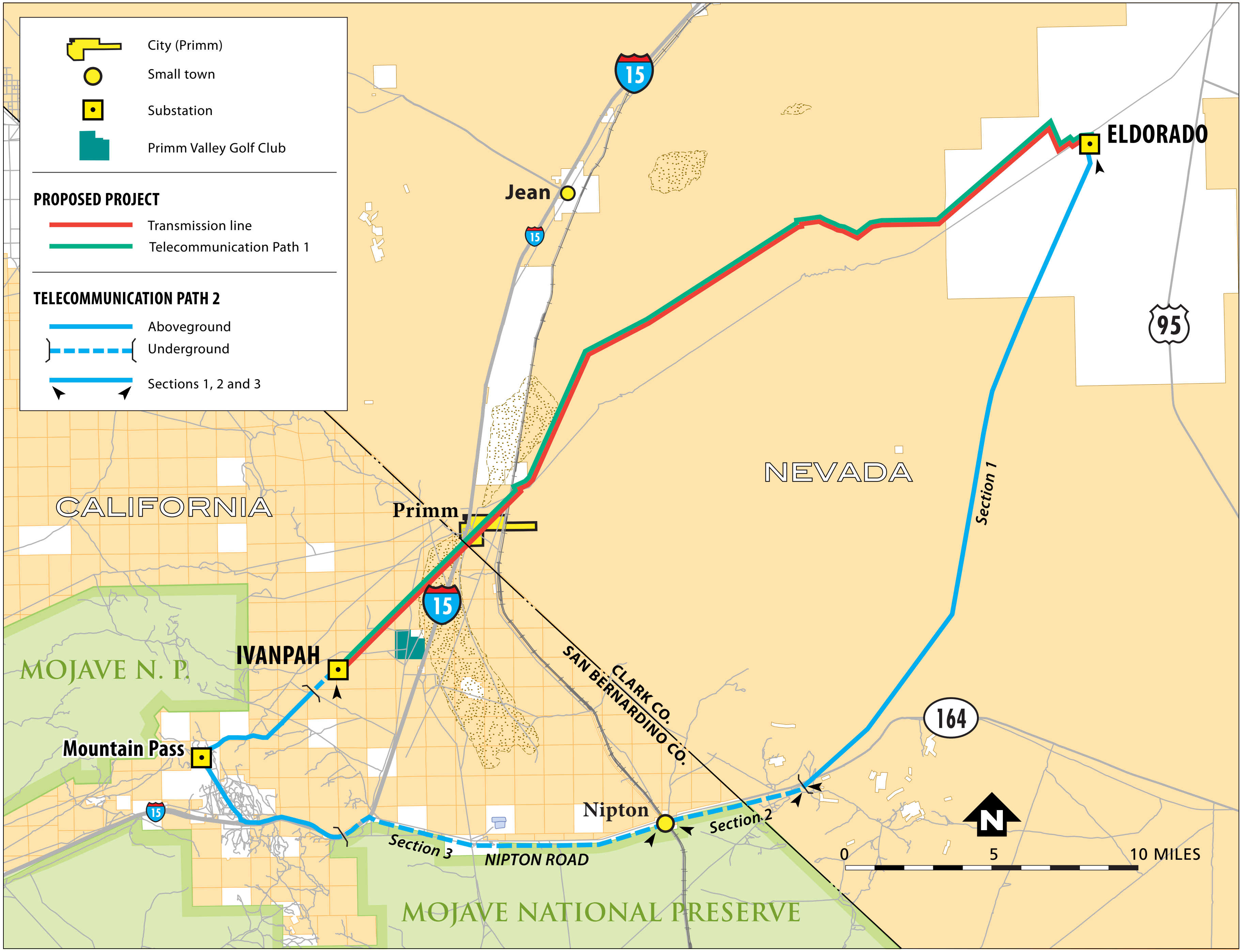

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Figure 2-14 **MOUNTAIN PASS TELECOMMUNICATION ALTERNATIVE**

Communication Enclosure at the Mountain Pass Substation

Dedicated communication enclosures would be included within the Mountain Pass Substation (6.0 miles southwest of the Ivanpah Substation) to house communication equipment. The communication equipment would be needed to repeat (re-generate) optical signals from/to Eldorado via telecommunication Path 2, Section 3. The enclosures would be equipped with an AC electrical power interface, batteries and battery chargers, air conditioners, and conduits for connection to fiber optic cables from distribution pole lines.

2.3.2.3 No Project / No action Alternative

The No Project Alternative / No Action alternative considers the environmental impacts if the proposed project and its alternatives are not built. Under this alternative, none of the activities or potential environmental impacts described in Chapter 3 would occur. Analysis of the No Project Alternative and the corresponding No Action Alternative is required by CEQA and NEPA, respectively, to allow federal (BLM) and state (CPUC) decision-makers to compare the impacts of the project and its alternatives with the impacts of not approving the project. A CPUC No Project decision would be the denial of the CPCN application filed by SCE. A BLM No Action decision would be the denial of the ROW application filed by SCE.

Under the No Project / No Action alternative, the objectives of the proposed project would not be accomplished. The electrical transmission system proposed to connect renewable energy sources in the Ivanpah Valley area would not be constructed. Therefore, the applicant and other California utilities might not be able to comply with the provisions of Executive Order 13212, the Energy Policy Act of 2005, the Federal Power Act, California Senate Bill 1078, or California Senate Bill 107.

The applicant would continue to operate and maintain the existing 115-kV transmission structures and the existing Eldorado Substation. The applicant would also continue to use existing access and spur roads for operations and maintenance.

The applicant is required to interconnect and integrate power generation facilities into its electric system, 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's Tariff. Further, state mandates require the applicant to increase its percentage of renewable generation sources in its overall energy portfolio. ~~As of November 2009, a~~A total of 68 applications ~~had been~~ were submitted for solar and wind energy projects on BLM lands near the Ivanpah Valley and Eldorado Valley areas by November 2009. CAISO has also identified other projects in the area that are in planning stage and for which applications are expected in the future. As of October 29, 2010, a total of eight active renewable generation projects had been seeking interconnection to the CAISO controlled grid in the Ivanpah Valley area. While many of these projects may not be constructed due to environmental issues discovered during the environmental review process or due to funding or legal issues, it is reasonable to assume that some of these projects will be approved and constructed.

The existing transmission system in the Ivanpah Valley area cannot support the interconnection of these renewable generation projects planned for the Ivanpah Valley area. With the proposed transmission system, the applicant would be able to connect some of the planned renewable generation projects in the Ivanpah Valley area to the existing CAISO-controlled grid, which would help the applicant meet the renewable generation goals set by the state.

Under the No Project Alternative / No Action-, the following events or actions (scenarios) related to electric generation and transmission could be reasonably expected to occur in the foreseeable future:

- As currently conceived, solar projects proposed in the Ivanpah Valley area would be postponed or cancelled. Applicants for certain projects planned in the area have stated their intention to connect to an upgraded 230-kV transmission network, and it can be reasonably assumed that other planned projects in the area have the same intention. These proposed renewable energy projects would have to find alternate means to connect to the existing transmission system without compromising system reliability.

- The California RPS[8], which requires retail sellers of electricity to increase their sales share produced by renewable energy sources to 20% by 2010, might not be achieved without access to renewable energy from the Ivanpah Valley. While access to renewable energy from the Ivanpah Valley could be provided via other methods, the location of the existing SCE transmission corridor in relation to the planned renewable generation projects in the Ivanpah Valley area make it a likely candidate for providing access to the CAISO-controlled grid.
- Other renewable energy resources would need to be identified and transmission studies would need to be conducted to connect these newly identified sources to the transmission grid. This could delay SCE's, and other utilities', ability to reach the RPS goal of 20% renewable generation sources by 2010.
- If the generation projects currently planned (mentioned above) were approved and constructed, transmission providers such as the applicant, Pacific Gas and Electric, or the LADWP would be required to accommodate the power load by upgrading existing transmission infrastructure or building new transmission facilities along a different alignment, and/or developers of solar and wind generation facilities would need to build their own transmission facilities to connect to the existing grid. These renewable generation facilities could also connect with a transmission system that serves customers outside of California.
- If the proposed transmission system is not constructed, the planned renewable generation facilities would need to find alternative means for transmitting their power to load centers and customers. This alternative might not meet the objectives outlined by the CPUC and the BLM. Specifically, under the No Project Alternative, access to the CAISO-controlled grid might but might not be provided to solar generation projects planned for the Ivanpah Valley area, because these projects might not be constructed or could connect to transmission systems that service customers outside of California.
- Under the No Project Alternative, the applicant would need to identify alternate renewable generation sources to meet the state RPS goals. This could result in delaying the applicant's ability to comply with the RPS mandate and, depending on the alternate sources identified, could result in greater environmental impacts than the proposed project as they might require creation of a new ROW or might require ground disturbance in previously undisturbed areas.

~~Further, if the proposed transmission system is not developed but the planned renewable generation facilities are developed, an alternative method for connecting renewable generation facilities in the Ivanpah Valley area would need to be developed. It is possible that other electrical utilities with transmission facilities in the area, such as LADWP, might purchase some of the power from the developers and integrate the electricity into its system.~~ Further, if the proposed project is not developed but the planned renewable generation facilities are still being developed in the Ivanpah Valley area, an alternative method for connecting renewable generation facilities would need to be constructed to support interconnection and provide sufficient capacity to accommodate full delivery of all the output from these projects. Another possibility is the development of a private transmission line, which would also connect renewable generation projects to the grid. Currently, these options are not planned and have not been analyzed for environmental impacts; however, because the proposed project would involve only the replacement of an existing transmission line within an existing ROW, it is reasonable to assume that these alternatives could result in greater impacts than the proposed project because they might require the creation of new ROW or might require ground disturbance in previously undisturbed areas.

[8] The Renewable Portfolio Standard—regulated by the CPUC—was established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107.

2.3.3 Alternatives Considered but Eliminated from Further Analysis

This section briefly describes the alternatives that will not be considered for further environmental analysis in this Draft EIR/EIS and the basis for those determinations, as a result of the alternatives screening process. These alternatives are not evaluated in detail in this Draft EIR/EIS. Detailed descriptions of these alternatives and explanations for their elimination are provided in Appendix A-1.

System Alternatives

Non-Transmission System Alternatives

As a result of agency and public comments on the Draft EIR/EIS, this alternative was evaluated in two separate scenarios: in-basin generation and demand-side alternatives. The in-basin generation alternative includes the development of in-basin generation resources, such as new solar, wind, and/or geothermal power plants in the immediate load serving area[9] with minor upgrades to the local distribution and subtransmission system, as opposed to developing new and upgraded transmission facilities to interconnect solar generation from the Ivanpah Valley Area. The demand-side alternative was defined based n the requirements of the California Public Utilities Code (PUC) Section 1002.3, including targeted energy efficiency, distributed generation, and other demand reduction resources.

After analysis of both scenarios, it was determined that the Non-Transmission System Alternatives would not provide an interconnection for new solar resources; would not meet the project's purpose, need, and objectives; and would not be feasible as an exclusive alternative to EITP and a renewable generation project, since it would not contribute enough to be considered a viable replacement strategy to every utility-scale generation/transmission project required to meet the anticipated state RPS goal of 20 percent by 2010.

The development of in-basin generation would not integrate generation resources in the Ivanpah Valley Area, and therefore, it would not enable SCE to comply with California's RPS. Also, because the development of in-basin generation would require development of new energy resources within the SCE service area, it might not avoid the adverse effects of the proposed project, including those that are potentially significant. In addition, because the ultimate capacity and eventual build-out of a demand-side scenario is speculative, the discussion of environmental impacts and feasibility of this scenario as an alternative to the proposed project would also necessarily be speculative. Therefore, the overall Non-Transmission System Alternatives was eliminated from further consideration.

~~This alternative would not meet the project's purpose, need, or objectives since it would not interconnect solar resources in the Ivanpah Dry Lake area with the SCE transmission system. In addition, new sources of in-basin generation would need to be identified, evaluated, and built. Transmission upgrades may also be required to integrate new in-basin generation sources into the transmission system. These new sources of in-basin generation would result in site-specific impacts associated with construction and operation of new power plants. This could result in air quality, biology, cultural resources, land use, noise, and visual impacts, among others.~~

Reconductoring Alternative

"Reconductoring" refers to the installation of new, higher capacity conductors, generally on existing towers. Reconductoring of the existing 115-kV single-circuit Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass transmission line between the Ivanpah Valley area and the existing Eldorado Substation would involve replacing the existing low capacity conductor with a new higher capacity conductor. According to information provided by the applicant, the maximum amount of generation that can be accommodated in a single-circuit 115-kV line is limited to no more than 80 MW. The use of reconductoring would avoid and/or lessen construction-related environmental

[9] Since the EITP objectives are focused on connecting renewable sources to comply with both federal and state mandates and improve reliability to the existing California ISO grid, an in-basin generation alternative would include potential renewable energy generation within SCE's service territory and eventually areas served by other IOUs that sign a PPA with the applicant. Therefore, an in-basin generation scenario for EITP would eventually cover multiple areas within the State of California.

impacts identified for the proposed project because it would replace low capacity conductors on the existing towers. However, this alternative would not meet the purpose, need, and objectives because it would not provide sufficient capacity. It also would not meet the project objective of interconnecting planned solar resources in the Ivanpah Valley ~~Dry Lake~~ area with the existing grid. Operations impacts would be similar to impacts of existing conditions.

Lower Voltage Alternative – New 115-kV Transmission Line

Under this alternative, SCE's standard 115-kV conductor would provide up to 217 megavolt amperes (MVA) of capacity. Within the existing ROW, the maximum number of individual 115-kV lines that can be accommodated is four. This would limit the maximum amount of generation that can be accommodated at each line to no more than 80 MW. According to information provided by the applicant regarding CAISO planning standards, the maximum amount of interconnection in this area with a new transmission facility is limited to no more than 1,150 MW if only one line is built. This alternative would not meet the project purpose, need, and objectives because it would not interconnect or integrate new generation resources (up to 1,400 MW) expected to be developed in the Ivanpah Dry Lake area. It would also not meet the objective of maximizing the use of existing ROW and corridors. Construction-related impacts would be similar to those of the proposed project if new poles would be installed.

Higher Voltage Alternative – New 500-kV Transmission Line

The Higher Voltage Alternative would include construction of new 500-kV transmission facilities between the Ivanpah Valley area and the existing Eldorado Substation. This alternative would not meet the project purpose, need, and objectives. It would require a wider ROW to accommodate the 500-kV transmission line for interconnecting up to the same amount of generation resources as those that could be connected with the proposed project. Additionally, there would be the potential for greater visual impacts than those of the proposed project because existing transmission structures would be replaced with structures that are taller, wider, and bulkier than those of the proposed project. Moreover, construction of a new 500-kV transmission line would require a wider ROW, rerouting, additional work for crossings, and a bigger footprint at substations as compared to the proposed project to accommodate transformer banks, switchracks, circuit breakers, and capacitors.

230-kV Single Circuit Transmission Line

This alternative would be identical to the proposed project except that it would include only one 230-kV transmission line instead of two. This Alternative would only allow for integration of up to 1,150 MW of new generation resources in the Ivanpah Valley instead of 1,400 MW provided by the proposed project. This alternative would not meet the project purpose and need. The maximum amount of interconnection in the Ivanpah Valley area is limited by the CAISO Spinning Reserve Criteria to no more than 1,150 MW if a new single circuit line is built[10]. This requirement is related to the CAISO Grid Planning Standard, which establishes the need to implement an SPS to connect generation in the Ivanpah Valley area under simultaneous outage. Since this alternative ~~It~~ would only provide capacity for interconnecting a maximum of ~~1,500~~ 1,150 MW, this~~. It would~~ alternative would not meet the purpose and need of providing transmission capacity of 1,400 MW.

Transmission Line Route Alternatives

New ROW for 230-kV Transmission Line Alternative (Transmission Alternative F)

This alternative would create an entirely new ROW for the 230-kV 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. This alternative would not meet the purpose and need of providing transmission capacity for 1,400 MW. It would require new ROW that is 2,000 feet away from the existing SCE 100-foot corridor. In addition, this alternative would have the potential for

[10] The CAISO Grid Planning Standard under Section IV (ISO Grid Planning Guides for New Generator Special Protection Systems) establishes that the total amount of generation tripped by an SPS for a single contingency cannot exceed the ISO's largest single generation consistency, currently identified as one Diablo Canyon unit at 1,150 MW.

greater land disturbance due to the need of a wider ROW, and greater impacts to sensitive resources for any area that is undisturbed and undeveloped.

Telecommunication Alternatives

Microwave Tower Only (Microwave Telecommunication Alternative)

This alternative system would consist of six microwave towers, four new communication buildings, and one passive reflector site (i.e., a site that consist of reflective panels to allow the microwave signal to transmit in areas where line of sight between towers is annulled or drastically reduced by interposing obstacles, such as mountains, buildings, trees, etc.). This alternative would meet the project purpose and need, but would not meet the project objective of minimizing environmental impacts. The use of multiple microwave towers for telecommunications would avoid the use of overhead or underground ~~wires~~fiber optic cable, reducing the potential for visual impacts compared with the proposed project. However, this alternative would also have the potential for greater ground disturbance and impacts to sensitive biological, cultural, visual, and other resources from the construction of six new microwave towers.

Technology Alternatives

Composite Core Conductor Alternative

This alternative involves replacing the standard conductor between the Ivanpah Dry Lake Area and the Eldorado Substation with a composite core conductor. The composite core conductor alternative is a new commercial technology. This alternative meets the project purpose and need. However, the composite core is more expensive and fragile than the standard core conductor. Moreover, implementation of this alternative would not meet the project objective of providing reliability.

Painted Structures Alternative

Under this alternative, the proposed galvanized structures, which do not require painting after construction, would not be used, and the transmission structures would be painted after construction to protect the steel surfaces. Paint treatments can range from light to dark. This alternative would meet the project purpose and need, but only partially meets the project objectives. Although this alternative would reduce aesthetic impacts, this effect would only be temporary; the aesthetic quality may be reduced over time as structures are exposed to weather, and paint may peel or chip and become unsightly. Repainting structures would increase safety concerns associated with mobilizing personnel and equipment, since repainting of structures might be needed over the life of the project. In addition, painting would take longer and increase potential for spills, hazards, and air quality impacts. Increased air quality impacts and exposure to hazardous materials would occur due to the release of volatile organic compounds and/or spills during the painting process.

Underground Construction

This alternative would allow undergrounding of transmission cables with voltages up to 500 kV. Trenching and tunneling would occur in order to place transmission lines underground. Underground construction would meet the project purpose and need; however, it would only meet some of the project objectives. Undergrounding would not minimize environmental impacts and construction could take longer. Although this alternative would reduce visual impacts and potential impacts on avian species due to electrocution, it would require greater land disturbance due to construction activities, and greater potential for long-term impacts to air quality, biological resources, traffic, noise, and geology/soils (erosion) due to higher incidence of maintenance problems or system failures, which would require excavation to replace underground cables.

All Tubular Steel Poles Alternative

This alternative considers using TSPs as transmission structures. TSPs are steel poles manufactured in long sections that taper in cross-sections from the base of the pole to top of the pole. This alternative would meet the project purpose and need. However, the use of TSPs for all transmission structures would not be technically feasible for 230-

kV double circuit systems, and therefore would have special manufacturing and construction requirements. Additionally, the use of TSPs would have the potential for greater disturbances of habitat, soils, and surface water, cultural and paleontological resources, and hazardous waste due to construction activities.

2.3.4 Identification of the Environmentally Superior Alternative (CEQA) / Preferred Alternative (NEPA)

CEQA Guidelines require identification of the environmentally superior alternative. If the No Project Alternative is environmentally superior, it requires identification as a superior alternative among all of those considered (California Code of Regulations [CCR], Title 14 §15126.6(e)(2)). The rationale and supportive information for the selection of the environmentally superior alternative under CEQA is provided in Chapter 4, "Comparison of Alternatives."

Under Title 40 CFR Section 1502.14(e), lead federal agencies are required to "identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference." In determining which alternative is preferred, lead federal agencies consider both the "environmentally preferable alternative" and the "agency preferred alternative." The "agency preferred alternative" is the alternative that the agency believes would fulfill its statutory mission and responsibilities, considering economic, environmental, technical, and other factors. Based on the conclusions of the environmental analysis, the BLM has determined that the preferred alternative is the proposed project / proposed action. The rationale and supportive information for this determination is provided in Chapter 4, "Comparison of Alternatives."

In contrast, the "environmentally preferable alternative," is the alternative that would promote the national environmental policy, as expressed in NEPA Section 101. Ordinarily, this means the alternative that would cause the least damage to the biological and physical environment; however, it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources (CEQ 1981). The environmentally preferable alternative will be identified by the BLM in the Record of Decision (ROD) for the project.

2.4 Project Construction

This section describes the main features of the construction of the proposed project and its alternatives. Since the project alternatives mainly consist of route variations of the proposed ROWs for transmission and telecommunication lines, general construction techniques and features for the alternatives would be similar to those described for the proposed project. Special considerations for specific alternatives are detailed in each subsection, as required.

Construction of each component of the proposed project and alternatives would involve a sequence of pre-construction and construction activities. Pre-construction activities include surveys, clearing, grading, and other site preparation activities and access and spur road works, as well as dismantling of existing facilities such as transmission line structures, transmission hardware, conductors, overhead ground wires, and transformer banks.

In general, construction of transmission, subtransmission, and distribution lines involves the following steps (Grigsby 2007):

- Preparing site and clearing ROW
- Framing – erecting poles, towers, or other transmission- and distribution-supporting structures, including foundations and anchors on guyed structures
- Installing conductors – pulling, stringing, and splicing conductors
- Installing optical ground wire – pulling, stringing, and splicing

- Grounding – bonding and connecting all equipment, conductors, and structures to a ground source for maximum safety at the construction sites
- Energizing – connecting the existing line in service to the new conductor
- Cleaning up and restoring the temporary disturbed sites

Additionally, construction of the proposed telecommunication system would involve overhead installation of optical ground wire and underground construction of duct banks for fiber optic cables.

2.4.1 Eldorado–Ivanpah Transmission Line Construction

The proposed Eldorado–Ivanpah 230-kV transmission line construction would require the removal of approximately 250 existing towers along 35 miles of the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line corridor. These transmission structures would be replaced by 216 new LSTs and 42 steel H-frames. Each structure would require multiple drilled, poured-in-place, concrete footings that would form the structure foundation. Construction would also include support activities, such as establishing material staging yards, and the development of access roads and spur roads.

The steps involved in the construction of the EITP would be:

- Conducting pre-construction surveys
- Establishing approximately seven construction yards and two helicopter staging areas
- Upgrading and establishing access and spur roads
- Dismantling and removing existing 115-kV transmission facilities
- Preparing sites for the LST and H-frame structures
- Installing foundations for the LST and H-frame structures
- Assembling and erecting LST and H-frame structures
- Installing conductors (guard structures, wire stringing, pulling, tensioning, and splicing)
- Grounding
- Cleaning up and restoring the site

Pre-construction surveys

Technical pre-construction surveys would be required to complete the detailed engineering designs, to evaluate necessary erosion and other environmental controls, and to determine final locations of the proposed transmission structures. During this phase, the project design would be modified to avoid environmentally sensitive areas or to ensure structural integrity and sustainability. During the surveys, crews would locate spur road centerlines, grades, and soil boring locations. Using results from the pre-construction surveys, the applicant would make final determinations of road location curvature, cuts and fills, grades and drainage, and necessary erosion controls in accordance with design standards and practices and/or landowner requirements.

Pre-construction surveys would also result in adjustments of the size and location of the proposed excavation and tower foundation sites, depending on the type of the transmission structure (LSTs or H-frames) and the soil conditions at each site. Adjustments of the proposed excavation sites might be necessary to address excavation difficulties, avoid an environmental sensitivity, or maintain structural integrity and sustainability.

Construction Yards and Helicopter Staging Locations

Project construction would begin with establishment of approximately seven temporary construction yards and two helicopter ~~landing sites~~ staging areas located at strategic points along the route. Two construction yards would be in California and five in Nevada. The proposed location and current condition of each yard and landing site are listed in Table 2-9. The applicant or its contractors might use additional construction yards.

Table 2-9 Proposed Construction Yards and Helicopter Staging Areas Locations

No.	Location	MP	Distance to ROW (miles)	Current Condition	Area (acres)(1)
CY 1	Eldorado Substation, NV	0	0	Previously disturbed	9.8
CY 2	Jean, NV	15	11.5	Previously disturbed	13.6
CY 3	Generating Station Yard, NV	27	0.4	Previously disturbed	16.5
CY 4	Primm Valley Casino Vacant Lot, NV	28	0.1	Previously disturbed	28.3
CY 5	Whiskey Pete's Casino Vacant Lot, NV	28	1.1	Previously disturbed	2.4
CY 6	BrightSource Generating Station Yard, CA	35	0	Unknown (public land)(2)	10+
CY 7	Nipton, CA (3)	n/a	4.7	Previously disturbed	2.5
~~HL~~ HS 1	East of McCollough Pass	9	0.2	Not disturbed (4)	~~3.6~~5.0
~~HL~~ HS 2	West of McCollough Pass	15	0.01	Not disturbed (4)	5.7

Source: SCE 2009
Notes:
(1) Approximate areas based on current design
(2) Only Construction Yard #6 is located on public (BLM) land
(3) Construction Yard #7 is proposed for tower retrofit activities
(4) Based on aerial imagery
Key:
CY = Construction Yard
~~HL~~ HS = Helicopter ~~Landing~~ Staging ~~site~~area
n/a = not applicable

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 administrative personnel. Maintenance of construction equipment would be conducted at these yards.

The number of workers reporting to any one construction yard is not expected to exceed approximately 100 workers at any time. Construction yards would range between 2 and 28 acres, depending on land availability and intended use. Construction of the Ivanpah Substation would not require a temporary laydown area outside the substation fenced area.

The applicant would arrange temporary electrical and telephone connections at the construction yards with local electrical and communication service providers. Water also would be provided by local vendors. During the peak construction period, approximately 80 private commuting vehicles and the construction vehicles/equipment would also be parked at the construction yards. Crews would load materials onto work trucks and drive to the current construction location. At the end of each day, crews 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
- Optical ground wire cable
- Hardware

- Construction equipment
- Steel structural components
- Insulators
- Signage
- 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

Due to greater efficiency and lower cost, the applicant would use conventional ground supported access construction methods for the transmission line construction. Helicopters would be mainly used during the transmission line stringing activities ~~(sock or pilot line threading)~~, as described further in this section. The applicant would develop a preliminary access plan and detailed engineering design to identify specific structures and/or portions of the proposed transmission line that would require helicopters as an alternate method of construction. ~~Final location of helicopter staging areas for the proposed project would be determined with the input of the helicopter contractor and affected private landowners and land management agencies.~~ Locations of helicopter staging areas for the proposed project have been identified as part of the project design

During stringing activities, preliminary helicopter operations would be based at the Jean Sport Aviation Center located in Jean, Nevada, and on roads adjacent to the pulling/tensioning sites. Helicopter fueling would occur at staging areas or at the 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, under security measures to be implemented by the applicant in coordination with the Clark County Department of Aviation (CCDOA) or at a staging area if adequate security is in place. Use of the existing Jean Sport Aviation facilities for helicopter staging and fueling would require coordination between the applicant and the CCDOA.

The size of each material or helicopter staging area would depend on the size and number of structures to be removed and installed. Staging areas would likely change as the work progressed along the transmission lines.

Access and Spur Roads

Transmission line roads are classified into two main groups: access roads and spur roads. Access roads run between tower sites and serve as a main transportation route along the transmission line ROW. Spur roads usually lead from the access roads and terminate at one or more structure sites.

Approximately 35 miles of existing main roads would need to be upgraded to support the proposed 230-kV line construction and operations. In addition, ~~more~~ approximately 1.2 miles of new access roads would be required for construction and maintenance of the telecommunications facilities, as well as additional access roads for connecting the project facilities to support and logistics areas, such as the road coming from Jean to the project ROW. Additionally, 1.7 miles ~~1.2 miles~~ of spur roads would be constructed to allow passage of construction vehicles to the construction sites. Upgrades and new construction might require vegetation clearing and grading based on site conditions. The new spur roads would be a minimum of 14 feet wide. It is anticipated that most of the spur roads would be left in place to access the facilities for operations and maintenance.

The existing access and spur roads might require reconstruction and maintenance prior to construction activities. Reconstruction works would include clearing, grading, and compacting the existing roads to remove potholes, ruts, and other surface irregularities to provide a smooth and dense surface capable of supporting heavy equipment. Specific locations for reconstruction works would depend on impacts of weather conditions over the existing roads and final project engineering design.

Dismantling and Removal of Existing 115-kV Transmission Facilities

The project would involve removing 208 existing 115-kV LST H-frames, 13 existing 115-kV LSTs, 23 wood pole H-frames, 6 wood poles and associated hardware (cross arms, insulators, vibration dampeners, suspension clamps, ground wire clamps, shackles, links, nuts, bolts, washers, cotter pins, insulator weights, and bond wires), and the transmission line conductor.

The applicant proposes to remove the existing 115-kV structures and conductors in the following sequence:

- Road work – Existing access roads would be used to reach structures, but some rehabilitation and grading might be necessary before removal activities were begun to establish temporary crane pads for structure removal.
- Wire-pulling locations – Wire-pulling sites would be located every 15,000 feet along the existing utility corridor, and would include locations at dead-end structures and turning points. Many of the locations used for the removal of existing 115-kV lines would be used for installation of the new 230-kV lines.
- Cable removal – A 3/8-inch pulling cable or rope line would replace the old conductor as it was removed. The cable would then be removed under controlled conditions to minimize ground disturbance, and all wire-pulling equipment would be removed. The old conductor wire would be wound onto "breakaway" reels as it was removed and would be transported to a construction yard where it would be prepared for recycling.
- Structure Removal – For each type of structure, a crane truck or rough-terrain crane would be used to support the structure during removal; a crane pad of approximately 50 by 50 feet might be required to allow a removal crane to be set up at a distance of approximately 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 to 2 feet. Holes would be filled with removed soil and compacted, and then the area would be smoothed to match the surrounding grade.

Site Preparation

Installation of the 230-kV transmission line would require construction of approximately 216 new LSTs and approximately 42 steel H-frame structures. Each LST and H-frame structure would be installed onto a flat, vegetation-free area or pad. The applicant would grade and/or clear to create a vegetation-free surface for footing construction. Grading would be conducted so that water would run in the direction of the natural drainage and ponding and/or erosion would be prevented. The graded area would be compacted and would be capable of supporting heavy vehicular traffic.

Ideally, structure laydown areas with sparse vegetation would not require vegetation clearing. The applicant would apply alternative methods such as drive and crush, mowing, and trimming of the laydown areas instead of clearing vegetation, although use of such methods might increase the risk of fire during the assembly erection process. The structure locations themselves and the 25-foot clearance area around the structures would require clearing.

The LSTs and steel H-frame structures would be assembled near the locations where they would be installed. Typically, they would be assembled in an approximately 200-by-200-foot laydown area. Depending on the condition of the area, clearing and/or grading would be necessary to prepare it for construction.

To erect either the LSTs or the steel H-frame structures, a crane pad (a flat, vegetation-free area) may need to be established within the laydown area described above. Crane pads would be located approximately 60 feet from the centerline of each structure.

In mountainous areas, special techniques might be required to provide access for construction, assembly, erection, and wire-stringing activities during the transmission line construction. These special techniques would be used to help ensure the safety of personnel during construction activities.

Foundation Installation

Each of the 216 new LSTs and approximately 42 steel H-frame structures for this project would require multiple drilled, poured-in-place concrete footings to form the structure foundation. The size of the foundation would depend on the type of structure, soils conditions, and topography. LST foundations would consist of four concrete footings, while H-frames would have two concrete footings.

The foundation construction process would start with drilling the boreholes for each footing. The boreholes would be drilled using truck- or track-mounted drill rigs. LSTs typically require a borehole 3 to 4 feet in diameter and 20 to 45 feet deep. Steel H-frame structures typically require a borehole 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. The actual depth of footings would depend on specific site soil conditions and topography and would be determined during final engineering; however, the maximum anticipated depth below ground surface is 45 feet.

Where excavation holes needed to be drilled in soft or loose soil or if they extended into groundwater, they would be stabilized with casings or drilling mud slurry. Mud slurry would be placed in the hole after drilling to prevent sloughing. The slurry would be pumped into the footing excavation hole. The concrete would then be pumped to the bottom of the excavation hole in a rigid pipe. As the slurry mud was displaced by the concrete, it would be pumped from the excavation hole into a vacuum truck. The drilling/slurry mud would be disposed at an approved facility, in accordance with the applicant's waste management practices.

In areas not accessible by road, equipment and material could be deposited at structure sites using helicopters or by workers on foot, and crews could prepare the footings using hand labor assisted by hydraulic or pneumatic equipment or other methods.

Prior to drilling excavation holes in California and Nevada, the applicant 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.~~

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. LST foundations would require between 25 and 100 cubic yards of concrete, depending on the type of structure being constructed. H-frame structure foundations would require between 80 and 120 cubic yards of concrete.

During construction, existing concrete suppliers would be used when feasible. If no concrete suppliers exist in certain areas, a temporary concrete batch plant would be established. If necessary, the applicant would consider setting up a temporary concrete batch plant in a 2-acre site within the construction area. 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.

Structure Assembly and Erection

Structural components of the LSTs and H-frames would be bundled and shipped by rail or truck to the construction yards, and then trucked to the individual sites. LSTs and H-frames would be assembled at laydown areas at each site, and then erected and bolted to the foundations. Ground disturbance would generally be limited to the laydown areas, which would typically occupy an area of 200-by-200 feet (40,000 square feet). Vegetation would be removed and the areas would be graded.

LSTs assembly would begin with hauling and stacking the bundles of steel, using several tractors with 40-foot trailers and a rough-terrain forklift. After the steel was delivered and stacked, the construction crew would begin assembling the leg extensions, body panels, boxed sections, and bridges. The steel work would be completed by a combined erection and torquing crew with a lattice boom crane. The construction crew would install insulators and wire rollers (travelers) at this time.

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 once the concrete foundation had been cured. 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 on the terrain and available equipment. Laydown areas would be established for the assembly process at each H-frame structure location.

Where road access was available, assembled sections would be lifted into place by an 80-ton crane. The crane pad would be located transversely to the structure and set up approximately 60 feet from its centerline. The crane would move along the ROW to erect subsequent structures.

For structures that would be located in terrain inaccessible to a crane, helicopters might be used for structure erection. Helicopter use is expected only in the McCullough Pass area and for line stringing. The final decision on helicopter use will be made by the applicant and the construction contractor.

The use of helicopters for the erection of structures would be conducted in accordance with the applicant's specifications and would be similar to methods detailed in Institute of Electrical and Electronic Engineers 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 depend on the size and number of structures to be installed.

Conductor Installation

Wire-Stringing

Stringing includes all activities associated with installation of the transmission line conductors onto the LSTs and/or the steel H-frames, including the installation of primary conductor and optical ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Insulators and stringing sheaves (rollers or travelers) are usually attached to the conductors as part of the stringing activity if the work consists of replacing conductors on existing towers (also known as reconductoring); otherwise, they are attached to the new structures during the steel erection process. Stringing conductors and optical ground wires on new transmission lines would begin once a number of structures had been erected and inspected. The dimensions of the area needed for the stringing setups associated with conductor installation depend on terrain.

Prior to stringing activities, several items used during the 115-kV conductor removal would be inspected or reinstalled, such as bucket trucks, wood pole guard structures, and temporary protective net systems used at the crossings for roads, streets, railroads, highways, or other transmission, distribution, and communication facilities.

The following four steps describe the wire stringing activities proposed by the applicant:

Step 1. Stringing the sock or pilot line – a lightweight sock line (also known as a pilot line) would be transported and installed tower to tower using a helicopter. This pilot line would be threaded structure to structure through wire rollers, which are attached to each tower insulator so the conductor can be pulled through. 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 considered safe locations for landing.

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 transmission line conductor using a special swivel joint to prevent damage to the conductor 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. The conductors would then be pulled through ~~the length of the span~~ a series of structures by a puller machine. Another machine called a tensioner would be located at the ~~other end of the span~~ opposite end of the pull, between the pulling and tensioning sites, near the reel of conductor. The puller and tensioner are operated together during the pulling phase to ensure that the conductor complies with technical specifications, such as maintaining the proper ground clearance.

Conductor pulling locations would occur every 15,000 to 18,000 feet on flat terrain and would be more closely spaced in rugged terrain. Wire pull locations would be selected, where possible, based on the geometry of the line as affected by changes in routing directions, changes in the terrain, and suitability of stringing and splicing equipment setups.

Step 3. Splicing, Sagging, and Dead-ending – Once each conductor is pulled through the length of the transmission line, all temporary pulling splices would be removed and replaced with permanent splices. Conductor splices would occur every 7,500 to 9,000 feet on flat terrain or more closely in rugged terrain. Once the splicing was completed, the conductor would be sagged to proper tension to avoid effects in the conductor length due to changes in temperature (conductors expand or contract with high or low temperatures). In addition, all phases to be installed between two towers would be sagged to the same tension. After splicing and sagging, conductors would be ~~fixed to dead-end towers~~ attached to dead-end structures and also to all the suspension towers.

Step 4. Clipping-in and Spacers – After the conductors were ~~fixed~~ attached to dead-end towers, the conductors would be ~~clipped in or~~ attached to all tangent structures—a process called clipping-in. This process would involve removing the existing wire rollers and replacing them with final insulator hardware to secure the conductors to the insulators. Once this was complete, spacers would be attached between the bundled conductors of each phase to ~~maintain~~ keep uniform separation between each conductor.

An overhead optical ground wire would be installed on the transmission line for shielding and communication, as described in Section 2.4.5. On the EITP 230-kV transmission line, the pulling and tensioning sites would be used for both wire and optical ground wire installations, while the proposed stringing activities on the Eldorado–Lugo 500-kV line (Telecommunication Line Path 2, Section 1) would be for the optical ground wire installation only. The optical ground wire is typically installed in continuous segments, each up to 19,000 feet long, if installed in conjunction with the conductor, depending on factors including line direction, inclination, and accessibility. Following installation of the optical ground wire, the strands in each segment would be spliced together to form a continuous length from one end of the transmission line to the other.

Stringing would be conducted in accordance with the applicant's specifications, which are similar to process methods detailed in Institute of Electrical and Electronic Engineers Standard 524-2003, Guide to the Installation of Overhead Transmission Line Conductors. The applicant has developed a standard wire-stringing plan that includes a sequenced program of events starting with determination of wire pulls and equipment set-up positions, pulling times, and safety protocols needed for safe and quick installation of wire. To protect the safety of workers and the public, safety devices such as grounding, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to initiation of wire-stringing activities.

Guard Structures

During installation, conductors can fall. Public agencies differ on their preferred methods to protect public safety during conductor stringing operations. For major roadway and utility crossings, typically one of the following four methods is employed to protect the public:

- Erection of a highway net guard structure system or guard pole structures
- 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

Guard structures are temporary facilities that protect underlying areas during wire stringing operations. They are designed to stop the movement of a conductor if it falls during installation. Typical guard structures are 60- to 80-foot-tall wooden poles (and are buried 6 to 8 feet into the ground). The number of guard poles installed on either side of a crossing varies between two and four depending on the width of the conductor being installed. Temporary nets also could be installed to protect some structures located under the transmission lines. Guard structures are usually removed once a conductor is installed. None of the other public safety methods require ground disturbance.

Based on the number of road crossings that would be needed along the proposed project route, the applicant has estimated that approximately 16 guard structures (Table 2-10) would be necessary. The exact number and type of guard structures would be field-verified upon completion of final design.

Table 2-10 Proposed Guard Structure Locations

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

Key:
GS = Guard Structure
MP = Milepost

Pulling and Splicing

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. The final number and locations of the puller, tensioner, and splicing sites would be determined during final engineering for the project, depending on the construction methods chosen by the applicant or its contractor. The puller, tensioner, and splicing set-up locations require level areas to allow for maneuvering the equipment. When possible, existing level areas and existing roads would be used, to minimize the need for grading and cleanup.

The minimum areas needed for pulling, tensioning, and splicing equipment setup sites would be:

- 150 by 500 feet for tensioning equipment,
- 150 by 200 feet for pulling equipment, and
- 150 by 100 feet for splicing equipment.

However, crews can work from within slightly smaller areas when space is limited.

At an optical ground wire 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-by-3-by-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.

Grounding

Grounding is a general industrial safety procedure implemented for construction of electric facilities. It entails connecting to the ground all equipment, conductors, anchors, and structures within a defined work area. It can also be accomplished by fully insulating equipment and operators, and by isolating equipment and personnel (Grigsby 2007).

Grounding techniques for electric transmission facilities and equipment depend on the ability of materials to oppose the electric current flow, also known as electrical resistance. Soil resistivity and the foundation-to-ground resistance are basic criteria commonly used for grounding electrical facilities and equipment. In particular, the applicant would consider a foundation-to-ground resistance criterion (with dry soil conditions) of 30 ohms or less to be safe, for transmission structures that are located more than 700 feet from a substation. If this condition cannot be met by using ground rods, the applicant would install special counterpoise systems at the structure footings to reduce the resistance to safe levels. Those structures within the Ivanpah Substation boundary would be grounded to the substation ground grid.

Site Cleanup

The applicant would restore all areas that were temporarily disturbed by proposed project activities (including material staging yards, pulling and tension sites, and splicing sites) following the completion of construction. Restoration would include grading, restoring 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. The BLM will require the applicant to mitigate by monitoring restoration for a given period after reclamation, to assure that cleanup activities were successfully completed and satisfactory reclamation was achieved.

During construction, heavy duty vehicles ~~water trucks~~ would be used on existing roads ~~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 was complete.

Water Usage and Supply

Water usage would be necessary for dust control during construction only. The applicant estimated using a maximum of between 32,000 and 40,000 gallons per day (gpd) of water for the construction phase, or 30.6 to 38.3 acre feet per year. The water supply would be provided by the Molycorp Minerals, LLC Mountain Pass facility. The applicant identified potential local sources of water, such as the Molycorp Minerals facility, the Las Vegas Valley District (LVVWD) and the City of Henderson in Nevada. Other potential sources of water analyzed included Primm Properties (Primm Nevada) and Boulder City, Nevada. Further discussion of the potential water sources for the project is provided in Section 3.8, "Hydrology and Water Quality." The applicant does not anticipate the need for a permanent water supply during operations, as indicated in Section 2.5.

2.4.2 Subtransmission Line Construction

At the transition point of the proposed project transmission line route going north into the Ivanpah Substation, seven existing LST H-frame structures would be removed and replaced with one single-circuit engineered TSP (Figure 2-7) and six LWS H-frames (Figure 2-8) within the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line ROW. In addition, six LWS H-frames would be installed at replaced structures to meet current requirements.

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

Construction of these structures would follow the general steps described in Section 2.4.1 for site preparation, foundation installation, structure assembly, and conductor installation. The final step in completing construction of the new 115-kV subtransmission line segment would be to energize the new conductor. To accomplish this, the existing lines in service would be de-energized and the connections to the new segment would be made.

2.4.3 Distribution Line Construction

A 33-kV distribution system would be constructed to provide auxiliary power to the Ivanpah Substation. This system would consist of approximately 4,800 feet ~~1 mile~~ of new underground and approximately 1,600 feet of new overhead 33-kV circuitry and two new Remote Control Switches (RCSs) that would be built to close the loop in the Nipton 33-kV circuit. The proposed work would be done next to Densmore Drive Road. One RCS would be south of Ivanpah Substation, and one would be next to the Primm Golf Course.

Ivanpah Substation power would be served from approximately 400 feet of new ducts and one run of cable from the Nipton 33-kV circuit to the location of the new station light and power transformer in the Ivanpah Substation. The exact location of the transformer would be determined during final engineering.

Additionally, about 4,300 feet of new 33-kV ~~12-kV~~ overhead distribution line would be constructed between the town of Nipton and the new microwave site northeast of Nipton. An overhead transformer would be installed with underground service to the microwave site. The line would be installed along the side of an existing dirt road.

Pole Upgrades

The telecommunication alternatives would include installation of fiber cables from Nipton to the Ivanpah Substation on the existing Nipton 33-kV distribution line wood poles. Distribution line poles would be replaced if the poles did not meet wind load requirements 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.

2.4.4 Ivanpah Substation Construction

Construction of the Ivanpah Substation would involve the following steps:

- Site preparation
- Excavation
- Substation equipment installation
- Paving
- Rock surfacing
- Spill prevention, control, and countermeasure, and Hazardous Materials Business Plan
- Storm water pollution prevention
- Fencing and security

Site Preparation

The substation area would be a 1,650-by-1,015-foot rectangle covering approximately 38.5 acres. It would be bounded by the applicant's existing 115-kV ROW on the southeastern side and open BLM land on the other three sides, currently proposed as the ISEGS project development areas described in Section 2.2.2.

Grading of the substation site and an access road to the site would be completed as part of the scope of the ISEGS project facilities described in Section 2.2.2.2 and would include grading of the 885-by-850-foot substation site and the 10-foot perimeter buffer. In addition, the ISEGS scope would grade the following areas at the substation site: the entire 17-acre substation pad, the cut and fill side slopes to blend the existing terrain with the new pad, and an earthen berm along the upslope pad boundaries to protect the substation from storm water runoff. In addition, the substation access roads and surface flow diversion/control measures would be graded and installed as part of the ISEGS project.

Two transmission line access areas would be included within the proposed substation site, approximately 1,015 by 400 feet (approximately 9 acres) each. These areas would provide room for the 115-kV and 230-kV transmission lines to turn into the station from the adjacent ROWs.

Land disturbance for the EITP substation construction would be limited to the actual structure erection locations, staging/pulling areas, and unpaved access roads. Other site preparation activities would include:

- Final grading
- Installation of 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
- Installation of a new conductor ground grid to cover the entire pad

Excavation

After the substation site was graded, excavation would be required to install below-grade facilities, including a ground grid, trenches, and equipment and structure foundations. The design of the substation ground grid would be based on soil resistivity measurements collected during a geotechnical investigation that would be conducted prior to construction. 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 begin 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; the soil would be spread on a portion of the substation property.

Substation equipment installation

Following the excavation and below-grade construction, installation of substation equipment and ancillary facilities, such as buses, capacitors, circuit breakers, transformers, steel structures, and the MEER would take place. The transformers would be delivered by heavy-transport vehicles and ~~off-loaded on site by large cranes with support trucks~~ escorted by traffic control. Because of their size and weight each transformer would be moved to its dedicated concrete foundation by towing it from the transport vehicle along temporary steel beams onto the foundation and lowered into place.

Paving

Asphalt concrete paving would be applied to 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 would be installed after all major construction had been completed.

Rock Surfacing

All areas within the substation perimeter that were not paved or covered with concrete foundations or trenches would be covered with a 4-inch layer of untreated, ¾-inch crushed rock. ~~This crushed rock layer would provide a safe work environment in those areas of the substation not previously insulated or electrically grounded.~~ The rock would be applied to the finished grade surface after all construction had been completed.

Spill Prevention, Control, and Countermeasures Plan

It is estimated that the proposed substation would store more than 1,320 gallons of transformer oil, requiring the development and implementation of a Spill Prevention, Control, and Countermeasures (SPCC) plan. The quantity of oil contained in any one of the planned 230/115-kV transformers would exceed the quantity above which the plan is required by law. The facility would be designed so the transformers would have secondary containment that would comply with all applicable regulations. In addition, all fueling trucks proposed to be used during construction would maintain on-board fuel spill plans and containment kits.

Storm Water Pollution and Prevention Plan

An SWPPP would be developed and implemented to prevent the potential discharge of contaminants and to prevent erosion during construction. The SWPPP would define areas where hazardous materials such as concrete would be stored; where trash would be placed; where rolling equipment would be parked, fueled, and serviced; and where construction materials such as reinforcing bars and structural steel members would be staged. Additionally, each construction yard will have a SWPPP in place.

Erosion control during grading of the unfinished site and during subsequent construction would be in place and monitored as specified by the SWPPP. ~~A siltation basin would be established to capture silt and other materials that might otherwise be carried from the site by rainwater surface runoff.~~ Additional information about the SWPPP is provided in Section 3.6, "Geology, Soils, Minerals, and Paleontology." Approximately 20 percent of the completed substation would consist of impervious materials such as concrete foundations and asphalt concrete paving.

Fencing and security

As described in Section 2.2.2.2, the entire substation area would be enclosed by perimeter gates and fencing. Perimeter fencing would conform to the applicant'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. Additionally, as part of the mitigated ISEGS Ivanpah 3 project (according to the FSA Amendment of March 2010), tortoise barrier fence would also be installed in accordance with the USFWS Recommended Specifications for Desert Tortoise Exclusion Fencing.

2.4.5 Telecommunication System Installation

Contractors would construct the telecommunication system. The applicant would be responsible for administration and inspection. During some stages of the proposed project, multiple locations would be under construction simultaneously. This could involve independent construction teams. Modifications of the existing Eldorado–Lugo 500-kV towers might include reinforcing or extending the structure body, installing horizontal diaphragms, and reinforcing structure legs. The applicant would develop detailed engineering drawings and procedures for fabrication and installation for each of the structure modifications.

The modifications to be performed on each structure would be identified by bundles. Each bundle would 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 would also be designed and installed at the ground peaks to support the optical ground wire clip-in hardware. The loading capacity of the upgraded structures would be able to support the loads for the new optical ground wire installation and meet the requirements of CPUC General Order 95 (State of California) and the National Electric Safety Code (State of Nevada). Final structure modification and associated construction activities would be determined once final engineering was completed by the contractor.

Optical Ground Wire Installation

For proposed project communications, optical ground wire segments would be installed on both the EITP 230-kV transmission line structures (Telecommunication Path 1), and along 25 miles of the Eldorado–Lugo 500-kV transmission line (Telecommunication Path 2, Section1). Optical ground wire installation would be performed in the same manner as the conductor installation, as described in Section 2.4.1. Optical ground wire is typically installed in continuous segments, each up to 19,000 feet long, depending on various factors including line direction, inclination, and accessibility. For Telecommunication Path 1, the pulling and tensioning sites would be the same as those proposed for the 230-kV conductor installation. For Telecommunication Path 2, the stringing activities on the existing Eldorado–Lugo 500-kV line would be conducted for the optical ground wire installation only.

Following installation of the optical ground wire, the strands in each segment would be spliced together to form a continuous length from one end of the transmission line to the other. At a splice structure, the fiber cables would be routed down the structure leg where the splicing would occur. The splices would be housed in a splice box (typically a 3-by-3-by-1–foot metal enclosure) mounted to one of the structure legs some distance above the ground.

Distribution line poles would be replaced if a pole did not meet wind load requirements with addition of fiber cable. Replacing a distribution line pole requires a five-person crew, one pole trailer truck, one pole digger truck, and one crew truck. An approximately 30-by-40-foot work area is required for the work. A hole about 8 feet deep 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.

Underground Installation

Following installation of the optical ground wire, on the last tower at each end of a transmission line, the overhead fiber would be spliced to another section of fiber cable that would run in underground conduit from the splice box into the communication room inside the adjacent substation. To install the fiber optic cable in existing and new underground conduits, a high-density polyethylene smooth-wall innerduct would be used to facilitate installation and to protect and help identify the cable. The innerduct would be installed first inside the conduit, and then the fiber optic cable would be installed inside the innerduct.

Connecting the optical ground wire with the substation would require several steps. The splice box would be mounted 20 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 the ground. A trench about 3 feet deep and 1.5 feet wide would be dug from the structure to the substation fence line. 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 substation fence line, the conduit would be connected to a trench inside the substation. Optical fiber nonconducting riser-type fiber cable would be pulled from the substation MEER to the splice box located on the last transmission structure. After the optical ground wire and optical fiber nonconducting riser-type cables were spliced, the splice case would be placed inside the substation site. About 40 by 60 feet of work area, two splice trucks with pulling equipment, and a four-person crew would be required for the underground cable installation. In addition, a three-person crew would be required to complete the fiber optic splicing.

Fiber Optic Cable Installation

The overhead fiber optic cable would be installed by attaching cable to structures in a manner similar to that described above for the transmission line stringing. Installation would involve attaching the cable to cross arms on distribution poles. This would require the use of a bucket truck. One four-person crew and two trucks would be used. A crew can install up to 2,000 feet of cable and 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 installation of vibration dampeners and suspension and dead-end hardware assemblies. Stringing sheaves (rollers or travelers) are attached during the framing process. As part of the applicant's standard wire stringing plan, the fiber optic installation would follow a sequenced program of events starting with determination of the number of cable pulls and cable pulling equipment set-up positions, pulling locations, times, and safety protocols needed for safe and quick cable installation.

Fiber optic cable pulls typically occur every 10,000 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 setups vary depending on the terrain; however, a typical stringing setup is 40 by 60 feet. Where necessary due to space limitations, crews can work from within a smaller area.

Installation of Microwave Tower and Communication Site

An approximately 100-by-100-foot area would be required for constructing each new communication site. Chain link fencing would be installed around the communication site perimeter. A typical communication site consists 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 a prefabricated building delivered to the site. Prefabricated buildings are set on a concrete foundation using a crane. The typical building size is 36 by 12 feet; the building consists of a generator room and an equipment room. The generator room houses an emergency backup generator and manual/automatic AC switch equipment. Dimensions of the communication building would be determined during final engineering design.

Microwave equipment, DC power equipment, and other telecommunication equipment would be installed in the MEER. A separate concrete pad with a 10-foot separation from the communication building would be constructed for fuel tank installation.

The required area for a typical free-standing, four-legged lattice steel communication tower is 25 by 25 feet. For the proposed project, the tower would be built outside the communication room or next to the MEER within the substation. Concrete footings would be installed to support the tower. Heavy equipment needed for construction would include 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-person crew might be on site at any given time for tower construction and antenna installation.

Construction of the new communication site would take approximately 6 months and would consist of the following steps:

- Prepare site
- Erect temporary fencing
- Set the foundations
- Install prefabricated building, fuel tanks, and emergency generator
- Erect the antenna tower (where necessary)
- Install telecommunication equipment and/or antennas
- Erect permanent fencing
- Clean up the site

2.4.6 Land Disturbance

Both temporary and permanent land disturbance would be associated with the EITP construction activities. Temporarily disturbed areas would be restored after construction and would be mainly associated with construction yards, laydown areas, and areas for tower assembly and erection. Permanent disturbance would occur primarily in the footprints of new structures (lattice towers, poles, H-frames, microwave towers), substation sites, access and spur roads, and other proposed permanent components. The following subsections present detailed tables indicating land disturbance estimates associated with the construction, operation, and maintenance of the proposed project and its alternatives.

2.4.6.1 Proposed Project

The estimated land disturbances associated with each component the proposed project are summarized in Tables 2-11 to 2-14. All temporary and permanent land disturbance estimations are based on the preliminary engineering design features presented by the applicant. Estimated total land disturbance from all the applicable proposed project components is approximately ~~466~~ 480 acres during construction, with a permanent disturbance of ~~51~~ 54 acres. Land disturbance would occur at each structure foundation site and also along new or restored access and spur roads. During grading on roads and at the substation sites, and during excavations at the proposed underground construction areas, soil and vegetation would be disturbed by trucks and other mobile equipment.

Table 2-11 230-kV Transmission Line Estimated Land Disturbance

Project Feature	Quantity	Each Disturbed Area (L x W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
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	25.9
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
115-kV conductor removal and 230-kV conductor and optical ground wire stringing setup area – puller (4)	23	200 feet x 150 feet	15.8	15.8	0.0
115-kV conductor removal and 230-kV conductor and optical ground wire stringing setup area – tensioner (4)	24	500 feet x 150 feet	41.3	41.3	0.0
230-kV conductor splicing setup areas (4)	12	150 feet x 100 feet	4.1	4.1	0.0
New access roads (5)	1.2 ~~0.0~~ miles	Miles x 14 feet	2.0 ~~0.0~~	0.0	2.0 ~~0.0~~
New spur roads (5)	1.7 ~~1.2~~ miles	Miles x 14 feet	2.49	0.0	2.49
El Dorado Substation material and equipment staging area	1	9.8 acres	9.8	9.8	0.0
Jean, Nevada – material and equipment staging area	1	13.6 acres	13.6	13.6	0.0
General Construction Yard – material and equipment staging area	1	16.5 acres	16.5	16.5	0.0
Primm Valley Casino vacant lot – material and equipment staging area	1	28.3 acres	28.3	28.3	0.0
Whiskey Pete's Casino vacant lot – material and equipment staging area	1	2.4 acres	2.4	2.4	0.0
ISEGS construction station – material and equipment staging area	1	10 acres	10.0	10.0	0.0
Helicopter Staging Area (East)	1	5.0 acres	5.0	5.0	0.0
Helicopter Staging Area (West)	1	5.7 acres	5.7	5.7	0.0
Total for 230-kV line construction(6)			**~~424.0~~ 437.2**	**~~386.1~~ 395.4**	**~~39.3~~ 41.8**

Notes:

(1) Includes removing existing conductor, tearing down existing structure, and removing foundation 2 feet below ground surface.

(2) Includes installing foundation, assembling and erecting structure, installing conductor and optical ground wire. Area to be restored after construction. The portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation would be permanently disturbed for each structure (suspension = 0.145 acre; dead-end = 0.187acre; heavy dead-end = 0.188 acres).

(3) Includes assembling and erecting structure, installing conductor and optical ground wire; area to be restored after construction includes a portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation; 0.185 acres 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) Quantity of this item is provided in linear miles, based on the expected length of road (in miles) and a road width of 14 feet.

(6) Totals refer to 230-kV line construction only. Disturbance from other project components are summarized in Table 2-22.The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review.

Table 2-12 Subtransmission Line Estimated Land Disturbance

Project Feature	Quantity	Each Disturbed Area (L x W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Remove existing lattice steel H-frame and construct new TSP (1) (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)(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)(3)	6	200 feet x 100 feet	2.8	2.4	0.4
Total (4)			**7.3**	**6.3**	**1.0**

Notes:
(1) Includes removing existing conductor, tearing down existing structure, and removing foundation 2 feet below ground surface.
(2) Includes assembling and erecting structure, installing conductor and shield wire. Area to be restored after construction. The portion of ROW within 25 feet of the TSP would remain cleared of vegetation. Approximately 0.057 acres would be permanently disturbed for each TSP.
(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 acres would be permanently disturbed for each LWS H-frame.
(4) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review for the project.
Key: LWS = lightweight steel; TSP = tubular steel pole

Table 2-13 Distribution Line Loop Estimated Land Disturbance

Project Feature	Quantity	Each Disturbed Area (L x W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Underground trench/duct for conduit (1)	1	~~2,600~~ 5,280 feet x ~~1.5~~ 2 feet	0.24 ~~0.09~~	0.24 ~~0.09~~	0.00
Underground manhole installation	~~2~~ 6	10 feet x 15 feet	0. 02 ~~0.01~~	0. 02 ~~0.01~~	0.00
Work area for underground manholes pulling area	~~2~~ 6	40 feet x 60 feet	0. 33 ~~0.11~~	0. 33 ~~0.11~~	0.00
Work area pulling of ~~3/8 mile~~1,600 ft of 1/0 ACSR pole line construction	~~3~~ 10	40 feet x 60 feet	0. 55 ~~0.17~~	0. 55 ~~0.17~~	0.00
Total			**1.14 ~~0.37~~**	**1.14 ~~0.37~~**	**0.00**

Note:
(1) Underground trench is approximately ~~1.5~~ 2.0 feet wide at most and ~~2,600~~ 5,280 feet long from the existing 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.
Key: ACSR = Aluminum Conductor Steel Reinforced

Table 2-14 Telecommunication System Estimated Land Disturbances

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Telecommunication Path 1					
Underground trench/duct for fiber entrance to Eldorado Substation (1)	1	500 feet x 1.5 feet	0.02	0.02	0.00
Underground trench/duct for fiber entrance to Ivanpah Substation (1)	1	500 feet x 1.5 feet	0.02	0.02	0.00

Table 2-14 Telecommunication System Estimated Land Disturbances

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Work area outside Eldorado Substation	1	40 feet x 60 feet	0.06	0.06	0.00
Work area outside Ivanpah Substation	1	40 feet x 60 feet	0.06	0.06	0.00
btotal sti ate ath			**0.14**	**0.16**	**0.00**
Telecommunication Path 2, Section 1					
Retrofit existing lattice steel structure (2)	45	150 feet x 150 feet	23.2	12.5	10.7
optical ground wire stringing setup area – tensioner (3)	9	50 feet x 100 feet	1.0	1.0	0.0
optical ground wire stringing setup area – puller (4)	9	50 feet x 100 feet	1.0	1.0	0.0
Nipton – material and equipment staging area	1	~ 2.5 acres	2.5	2.5	0.0
btotal sti ate ath e tion			**27.8**	**17.0**	**10.7**
Telecommunication Path 2, Section 2					
Work area at 500-kV tower M172	1	40 feet x 80 feet	0.07	0.07	0.00
4.8-mile underground fiber cable duct (5)	1	6.8 feet x 25,344 ~~25,200~~ feet	3.96 ~~3.93~~	3.96 ~~3.93~~	0.00
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	0.00
btotal sti ate ath e tion			**4.32 ~~4.30~~**	**4.30 ~~4.28~~**	**0.02**
Telecommunication Path 2, Section 3					
Building new microwave communication site	1	100 feet x 100 feet	0.23	0.00	0.23
Placing 0.7 miles of fiber optic cable	1	6.8 feet x 3,700 feet	0.58	0.58	0.0
Work area for underground vaults and fiber pulling area	2	40 feet x 60 feet	0.11	0.11	0.0
btotal sti ate ath e tion			**0.92**	**0.69**	**0.23**
Total			**33.2**	**22.1**	**11.1 ~~11.0~~**

Notes:

(1) Underground trench is approximately 1.5 feet wide, at most 500 feet long from the last structure to the substation fence line.

(2) Includes structure assembly and erection, and optical ground wire installation. Area to be restored after construction. The existing portion of ROW within 25 feet of the lattice steel structure footings would remain cleared of vegetation. The 10.8 acres is pre-existing permanently disturbed area around the structure for ongoing operation and maintenance access by the applicant.

(3) Based on 20,000-foot optical ground wire reel lengths and route design.

(4) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review.

(5) The calculated disturbed area is based on the trench method. The proposed trench would be 1.5 feet wide; average trenching/excavating machines have a tread width of 68 inches (5.67 feet) and 14 inches (1.17 feet) of ground clearance. The applicant would select other underground construction methods to reduce land disturbance, such as horizontal boring, if feasible.

Additionally, assembly and erection of the new LSTs, H-frames, and TSPs would require laydown areas, material and equipment staging areas, and pulling and tensioning sites. These sites might require vegetation clearing and grading to level areas prior to installation activities. Furthermore, installation of the subtransmission (115-kV) line would disturb 7.3 acres during construction and would result in a 1-acre permanent disturbance, while the proposed 33-kV distribution line segment would create a temporary disturbance of ~~0.37~~ 1.14 acres.

The acreage associated with the Ivanpah Substation is analyzed in the ISEGS FSA/EIR; however, construction of the EITP components associated with the proposed substation would occur without the construction of the ISEGS project. According to the revised ISEGS land disturbance estimations (FSA Addendum, BLM FEIS and ROD, and CEC Final Decision), the substation area for SCE use would be ~~13.3~~ 17 acres (CEC ~~and BLM~~ 2010c). Upgrades to the existing Eldorado Substation would be located on expanded yards within the existing substation boundaries; therefore, no temporary or permanent land disturbance is anticipated for this project component..

Installation of overhead ground wire and optical ground wire along the proposed telecommunication paths and permanent operation and maintenance of additional facilities such as the proposed microwave communication site in Nipton would create both temporary and permanent land disturbances. Temporary disturbance for the telecommunication component would total 33.2 acres, with an estimated permanent footprint of 11 acres.

2.4.6.2 Alternatives

Temporary and permanent additional land disturbance associated with the construction, operation, and maintenance of the transmission line routing and telecommunication alternatives are presented in Tables 2-15 to 2-21. Land disturbances estimated for the subtransmission and distribution lines components would be the same as those presented in Section 2.4.6.1. In addition, Table 2-21 compares the estimated land disturbances of alternatives with those resulting from the proposed project. All temporary and permanent land disturbance estimations are based on the preliminary engineering design features presented by the applicant.

Table 2-15 Estimated Additional Land Disturbance for Transmission Line Alternative Route A

Project Feature	Quantity	Each Disturbed Area (Length X Width)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Construct new lattice steel suspension structure (1)	26	200 feet x 200 feet	23.9	20.1	3.8
Construct new lattice steel dead-end structure (1)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct new lattice steel heavy dead-end structure (1)	1	200 feet x 200 feet	0.9	0.7	0.2
Construct new tubular steel double H-frame (2)	2	200 feet x 200 feet	1.8	1.5	0.3
230-kV conductor and optical ground wire stringing setup area – puller (3)	2	200 feet x 150 feet	1.4	1.4	0.0
230-kV conductor and optical ground wire stringing setup area – tensioner (3)	3	500 feet x 150 feet	5.2	5.2	0.0
230-kV conductor splicing setup areas (3)	2	150 feet x 100 feet	0.7	0.7	0.0

Table 2-15 Estimated Additional Land Disturbance for Transmission Line Alternative Route A

Project Feature	Quantity	Each Disturbed Area (Length X Width)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
New access roads (4)	~~0~~ 2.3 miles	Miles x 14 feet wide	~~0.0~~ 3.9	0.0	~~0.0~~ 3.9
New spur roads (4)	~~2~~ 0.5 miles	Miles x 14 feet wide	~~6.8~~ 0.85	0.0	~~6.8~~ 0.85
Total (5)			**~~43.4~~ 41.5**	**31.8**	**~~11.6~~ 9.7**

Notes:
(1) Includes foundation installation, structure assembly and erection, conductor installation, and optical ground wire 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 = 0.145 acres; dead-end = 0.187 acres; heavy dead-end = 0.188 acres).
(2) Includes structure assembly and erection, conductor installation, and optical ground wire 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 acres would be permanently disturbed for each tubular steel double H-frame.
(3) Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
(4) Quantity of this item is provided in linear miles, based on the expected length of road (in miles) and a road width of 14 feet.
(5) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based upon final engineering and review.

Table 2-16 Estimated Additional Land Disturbance for Transmission Line Alternative Route B

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Construct new lattice steel suspension structure (1)	24	200 feet x 200 feet	22.0	18.6	3.4
Construct new lattice steel dead-end structure (1)	6	200 feet x 200 feet	5.5	4.4	1.1
Construct new lattice steel heavy dead-end structure (1)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct new tubular steel double H-frame (2)	12	200 feet x 200 feet	11.0	8.8	2.2
230-kV conductor and optical ground wire stringing setup area – puller (3)	14	200 feet x 150 feet	9.6	9.6	0.0
230-kV conductor and optical ground wire stringing setup area – tensioner (3)	14	500 feet x 150 feet	24.1	24.1	0.0
230-kV conductor splicing setup areas (3)	0	150 feet x 100 feet	0.0	0.0	0.0
New access roads (4)	0 miles	Miles x 14 feet wide	0.0	0.0	0.0
New spur roads (4)	0.6 miles	Miles x 14 feet wide	0.6	0.0	0.6
Total Estimated (5)			**75.7**	**67.7**	**8.0**

Notes:
(1) Includes foundation installation, structure assembly and erection, conductor and optical ground wire 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).
(2) Includes structure assembly and erection, conductor installation, and optical ground wire 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 acres would be permanently disturbed for each tubular steel double H-frame.
(3) Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
(4) Quantity of this item is provided in linear miles, based on the expected length of road (in miles) and a road width of 14 feet.
(5) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review.

Table 2-17 Estimated Additional Land Disturbance for Transmission Line Alternative Route C

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Construct new lattice steel suspension (1)	25	200 feet x 200 feet	23.0	19.3	3.7
Construct new lattice steel dead-end structure (1)	8	200 feet x 200 feet	7.3	5.9	1.4
Construct new lattice steel heavy dead-end structure (1)	1	200 feet x 200 feet	0.9	0.7	0.2
Construct new tubular steel double H-frame (2)	0	200 feet x 200 feet	0.0	0.0	0.0
230-kV conductor and optical ground wire stringing setup area – puller (3)	4	200 feet x 150 feet	2.8	2.8	0.0
230-kV conductor and optical ground wire stringing setup area – tensioner (3)	4	500 feet x 150 feet	6.9	6.9	0.0
230-kV conductor splicing setup areas (3)	1	150 feet x 100 feet	0.3	0.3	0.0
New access roads (4)	1 mile	Miles x 14 feet wide	1.7	0.0	1.7
New spur roads (4)	0.7 miles	Miles x 14 feet wide	0.8	0.0	0.8
Total Estimated (5)			**43.7**	**35.9**	**7.8**

Notes:

(1) Includes foundation installation, structure assembly and erection, conductor installation, and optical ground wire 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 = 0.145 acres; dead-end = 0.187 acres; heavy dead-end = 0.188 acres).

(2) Includes structure assembly and erection, conductor installation, and optical ground wire 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.

(3) Based on 9,000-foot conductor reel lengths, number of circuits, and route design.

(4) Quantity of this item is provided in linear miles, based on the expected length of road (in miles) and a road width of 14 feet.

(5) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review.

Table 2-18 Estimated Additional Land Disturbance for Transmission Line Alternative Route D

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Construct new lattice steel suspension structure (1)	18	200 feet x 200 feet	16.5	13.9	2.6
Construct new lattice steel dead-end structure (1)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct new lattice steel heavy dead-end structure (1)	0	200 feet x 200 feet	0.0	0.0	0.0
Construct new tubular steel double H-frame (2)	0	200 feet x 200 feet	0.0	0.0	0.0
230-kV conductor and optical ground wire stringing setup area – puller (3)	2	200 feet x 150 feet	1.4	1.4	0.0
230-kV conductor and optical ground wire stringing setup area – tensioner (3)	2	500 feet x 150 feet	3.4	3.4	0.0
230-kV conductor splicing setup areas (3)	0	150 feet x 100 feet	0.0	0.0	0.0

Table 2-18 Estimated Additional Land Disturbance for Transmission Line Alternative Route D

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
New access roads (4)	0 miles	Miles x 14 feet wide	0.0	0.0	0.0
New spur roads (4)	0.4 miles	Miles x 14 feet wide	0.3	0.0	0.3
Total Estimated (5)			**24.4**	**20.9**	**3.5**

Notes:
(1) Includes foundation installation, structure assembly and erection, conductor installation, and optical ground wire 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 = 0.145 acres; dead-end = 0.187 acres; heavy dead-end = 0.188 acres).
(2) Includes structure assembly and erection, conductor installation, and optical ground wire 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.
(3) Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
(4) Quantity of this item is provided in linear miles, based on the expected length of road (in miles) and a road width of 14 feet.
(5) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review.

Table 2-19 Estimated Additional Land Disturbance for Transmission Line Subalternative Route E

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Construct new lattice steel suspension structure (1)	15	200 feet x 200 feet	13.8	11.6	2.2
Construct new lattice steel dead-end structure (1)	4	200 feet x 200 feet	3.7	2.9	0.8
Construct new lattice steel heavy dead-end structure (1)	0	200 feet x 200 feet	0.0	0.0	0.0
Construct new tubular steel double H-frame (2)	0	200 feet x 200 feet	0.0	0.0	0.0
230-kV conductor and optical ground wire stringing setup area – puller (3)	2	200 feet x 150 feet	1.4	1.4	0.0
230-kV conductor and optical ground wire stringing setup area – tensioner (3)	2	500 feet x 150 feet	3.4	3.4	0.0
230-kV conductor splicing setup areas (3)	0	150 feet x 100 feet	0.0	0.0	0.0
New access roads (4)	0 miles	Miles x 14 feet wide	0.0	0.0	0.0
New spur roads (4)	0.4 miles	Miles x 14 feet wide	0.3	0.0	0.3
Total Estimated Disturbance (5)			**22.5**	**19.3**	**3.2**

Notes:
(1) Includes foundation installation, structure assembly and erection, conductor installation, and optical ground wire 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 = 0.145 acres; dead-end = 0.187 acres; heavy dead-end = 0.188 acres).
(2) Includes structure assembly and erection, conductor installation, and optical ground wire 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 acres would be permanently disturbed for each tubular steel double H-frame.
(3) Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
(4) Quantity of this item is provided in linear miles, based on the expected length of road (in miles) and a road width of 14 feet.
(5) The disturbed acreage calculations are estimates based on the applicant's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW. These estimations are based on preliminary design information and are subject to revision based on final engineering and review.

Table 2-20 Estimated Additional Land Disturbance for the Golf Course Telecommunication Alternative

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
rst eg ent t n t					
9-mile underground fiber cable duct (1)	1	6.8 feet x 47,250 feet	7.38	7.38	0.00
Underground vaults	48	6 feet x 6 feet	0.04	0.00	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 all-dielectric self-supporting pole line construction	1	40 feet x 60 feet	0.06	0.06	0.00
btotal sti ate i st eg ent			**8.02**	**7.99**	**0.04**
ec n eg ent t an ah stat n l rse					
1-mile underground fiber cable duct (1)	1	6.8 feet x 5,280 feet	0.82	0.82	0.00
Underground vaults	6	6 feet x 6 feet	0.00	0.00	0.01
Work area for underground vaults and fiber pulling area	1	40 feet x 60 feet	0.06	0.06	0.00
Work area for fiber pulling of 12 miles of all-dielectric self-supporting pole line construction	12	40 feet x 60 feet	0.66	0.67	0.00
btotal sti ate e on eg ent			**1.55**	**1.54**	**0.01**
Total Estimated Disturbance			**9.57**	**9.53**	**0.05**

Note:
(1)The calculated disturbed area is based on the trench method. The proposed trench would be 1.5 feet wide; average trenching/excavating machines require a tread width of 68 inches (5.67 feet) and 14 inches (1.17 feet) of ground clearance. The applicant would select other underground construction methods to reduce land disturbance, such as horizontal boring, if feasible.

Table 2-21 Estimated Additional Land Disturbance for the Mountain Pass Telecommunication Alternative

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
rst eg ent t n t					
9-mile underground fiber cable duct (1)	1	6.8 feet x 47,250 feet	7.38	7.38	0.00
Underground vaults	48	6 feet x 6 feet	0.04	0.00	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 all-dielectric self-supporting pole line construction	1	40 feet x 60 feet	0.06	0.06	0.00
btotal sti ate i st eg ent			**8.02**	**7.99**	**0.04**
ec n eg ent t an ah stat n nta n Pass stat n					
1-mile underground fiber cable duct (1)	1	6.8 feet x 5,280 feet	0.82	0.82	0.00
Underground vaults	6	6 feet x 6 feet	0.00	0.00	0.00
Work area for underground vaults and fiber pulling area	1	40 feet x 60 feet	0.06	0.01	0.05
Work area for fiber pulling of 8 miles of	8	40 feet x 60 feet	0.44	0.44	0.00

Table 2-21 Estimated Additional Land Disturbance for the Mountain Pass Telecommunication Alternative

Project Feature	Quantity	Each Disturbed Area (L X W)	Acres Disturbed during Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
all-dielectric self-supporting pole line construction					
btotal sti ate e on eg ent			**1.33**	**1.27**	**0.05**
Total Estimated Disturbance			**9.35**	**9.26**	**0.09**

Note:
(1) The calculated disturbed area is based on the trench method. The proposed trench would be 1.5 feet wide and a tread width of 68 inches (5.67 feet) and 14 inches (1.17 feet) of ground clearance for average trenching/excavating machines. The applicant would select other underground construction methods to reduce land disturbance, such as horizontal boring, if feasible.

Table 2-22 Summary of Land Disturbances and Comparison between Alternatives

Project Feature	Proposed Route	Transmission Line Alternative Route A	Transmission Line Alternative Route B	Transmission Line Alternative Route C	Transmission Line Alternative Route D	Transmission Line Subalternative Route E
Per anent an st r ance acres						
Transmission line ROW (1)	36.8	35.5	41.3	37.9	36.9	37.0
New ROW (route alternatives only)	N/A	4.9	7.3	5.3	3.2	2.9
Access roads	~~0~~ 2.0	~~0~~ 3.9	0	1.7	0	0
Spur roads	~~2.4~~ 2.9	~~6.8~~ 0.9	0.6	0.8	0.3	0.3
Ivanpah Substation (2)	0	0	0	0	0	0
Eldorado Substation (3)	0	0	0	0	0	0
115-kV subtransmission line	1.0	1.0	1.0	1.0	1.0	1.0
33-kV distribution line	0.0	0.0	0.0	0.0	0.0	0.0
Telecommunication system (3)	11.0	11.0	11.0	11.0	11.0	11.0
Project with Microwave Path (4)	**~~51.2~~ 53.7**	**~~59.2~~ 57.2**	**61.2**	**57.7**	**52.4**	**52.2**
Golf Course Alternative (5)	**~~51.3~~ 53.8**	**~~59.3~~ 57.3**	**61.3**	**57.8**	**52.5**	**52.3**
Mountain Pass Alternative (6)	**~~51.3~~ 53.8**	**~~59.3~~ 57.3**	**61.3**	**57.8**	**52.5**	**52.3**
e rary an st r ance acres						
Transmission line construction (1)	242.9	273.7	305.0	286.6	282.0	282.0
Alternate route segments	N/A	24.5	34.0	25.9	16.1	14.5
Construction yards and pulling and tensioning sites	~~141.8~~ 152.5	~~149.1~~ 159.8	~~175.5~~ 186.2	~~151.8~~ 162.5	~~146.6~~ 157.3	~~146.6~~ 157.3
Ivanpah Substation (2) (3)	0	0	0	0	0	0
115-kV subtransmission line	7.3	7.3	7.3	7.3	7.3	7.3
33-kV distribution line	~~0.4~~ 1.1	1.1 ~~0.4~~	~~0.4~~ 1.1	~~0.4~~ 1.1	~~0.4~~ 1.1	~~0.4~~ 1.1
Telecommunication system (3)	22.1	22.1	22.1	22.1	22.1	22.1
Project with Microwave Path (4)	**~~414.9~~ 425.9**	**~~477.1~~ 488.5**	**~~544.3~~ 555.7**	**~~494.1~~ 505.5**	**~~474.5~~ 485.9**	**~~472.9~~ 484.3**
Golf Course Alternative (5)	**~~424.2~~ 435.2**	**~~486.4~~ 497.8**	**~~553.6~~ 565.0**	**~~503.4~~ 514.8**	**~~483.8~~ 495.2**	**~~482.2~~ 493.6**
Mountain Pass Alternative (6)	**~~424.4~~ 435.4**	**~~486.6~~ 498.0**	**~~553.8~~ 565.2**	**~~503.6~~ 515.0**	**~~484.0~~ 495.4**	**~~482.4~~ 493.8**

Notes:
(1) Does not include overlapping area between structure removal and new structure installation.
(2) Grading and other ground-disturbing activities of the Ivanpah Substation site would be approved under the ISEGS project, currently under environmental review.
(3) Telecommunication equipment to be installed within the existing fence line. Areas occupied by facilities installed within existing substation and communications site properties are not included in estimates.
(4) Includes proposed Telecommunication Line Path 1 and Path 2 Sections 1, 2, and 3 (Microwave Path).
(5) Golf Course Telecommunication Alternative: Path 1 and Path 2 Sections 1 and 2 and Golf Course segment.
(6) Mountain Pass Telecommunication Alternative: Path 1 and Path 2 Sections 1 and 2 and Mountain Pass segment.

2.4.7 Construction Workforce and Equipment

The proposed project would be managed by the applicant's Project Management Organization using both the applicant's and contract personnel. The estimated number of workers per project component is summarized in Table 2-23. A detailed list of personnel and equipment required for each phase of construction of the proposed project and its alternatives are presented in Appendix A-2. At some stages of the proposed project, multiple locations would be under construction simultaneously. This might involve independent construction teams working at different locations along the proposed project. According to the applicant, no more than four crews would be building four distinct transmission structures at a time during a maximum period of 7 days. Installing an LST would take 7 days to complete (from laying the foundation to erecting the tower), while the same process would last 5 days for installing a TSP.

Table 2-23 Construction Workforce Required for the Proposed Project

Project Component	Summary of Construction Activities	Total Estimated Workforce	Estimated Schedule (days)
230-kV transmission line	Conducting pre-construction surveys Establishing construction yards and helicopter landing areas Conducting road work Installing guard structures Removing existing conductors, structures, foundations, and wood poles Installing lattice steel towers and H-frames Installing conductor Removing guard structures Restoring temporary construction areas and roads	209	1,257
115-kV subtransmission line	Conducting pre-construction survey Conducting road work Removing existing H-frame poles and foundations Installing ~~tubular~~ lightweight steel poles Installing overhead shield wire	69	35
33-kV distribution line	Trenching Installing overhead line Installing underground cable	20	73
Ivanpah Substation	Conducting pre-construction survey Grading substation site Installing civil and electrical components	22	175
Telecommunication System	*Path* Installing optical ground wire	3	30
	Path ect n Establishing construction yards Conducting road work Retrofitting existing towers Removing existing overhead ground wire Installing optical ground wire Restoring temporary construction areas and roads	49	200
	Path ect n Trenching Pulling/installing underground fiber optic cable Installing underground duct	12	76
	Path ect n Pr se Pr ect Installing microwave site Trenching Pulling/installing underground fiber optic cable	16	20

Table 2-23 Construction Workforce Required for the Proposed Project

Project Component	Summary of Construction Activities	Total Estimated Workforce	Estimated Schedule (days)
	Installing underground duct		
	Path ect n l rse Alternat e Trenching Pulling/installing underground fiber optic cable Installing underground duct Installing all-dielectric self-supporting cable	24	153
	Path ect n nta n Pass Alternat e Trenching Pulling/installing underground fiber optic cable Installing underground duct Installing all-dielectric self-supporting cable	28	230

2.4.8 Construction Schedule

The applicant's targeted operating date is July 2013. Work activities would commence upon approval of the proposed project by the CPUC, the BLM, and other permitting agencies. Construction is currently scheduled to commence in the last quarter of year 2011 and to take approximately 19 months to complete, including time for inspection and testing (Figure 2-15).

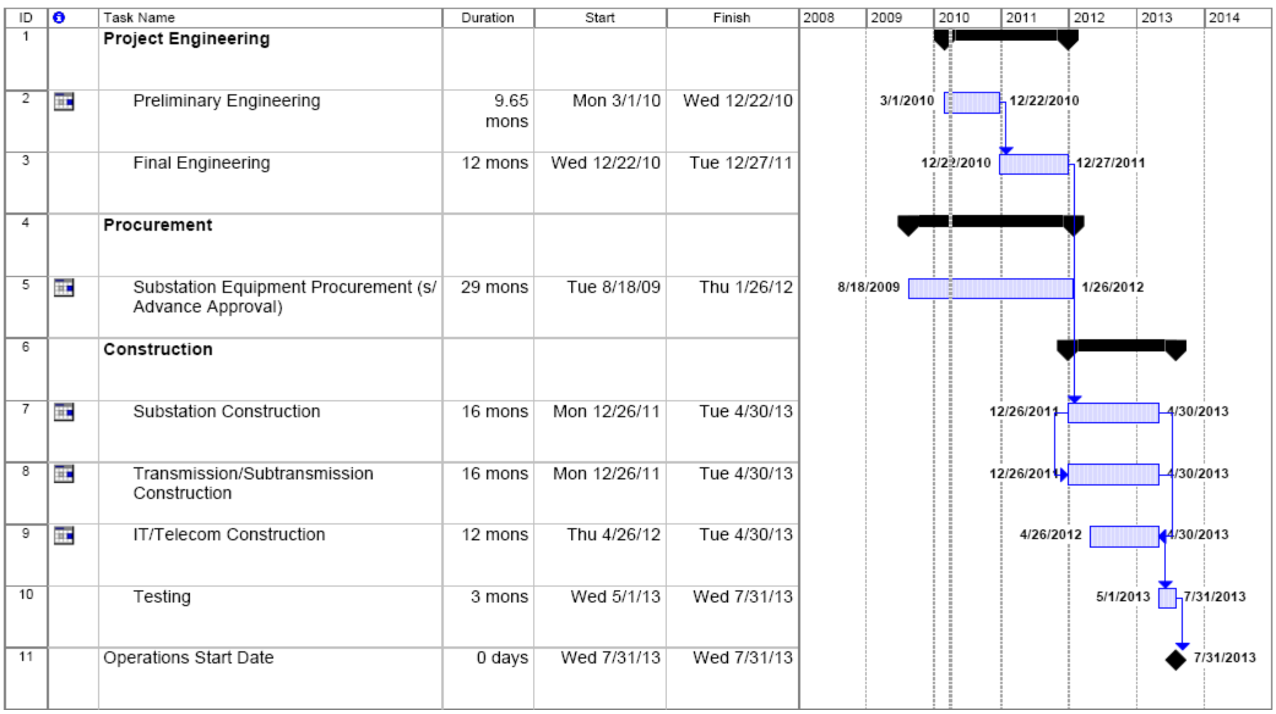

Figure 2-15 EITP High-Level Project Schedule

To facilitate renewable energy interconnections, efforts will be made to accelerate the operating date through shorter agency decision time and compressed procurement and construction schedules. In populated areas, the applicant 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.

2.4.9 Hazardous Materials and Waste Management

The applicant would apply waste management procedures to control and prevent potential environmental, health, and safety issues during project construction. All handling and disposal of hazardous waste would be in accordance with applicable federal, state, and local laws. The following subsections describe the major types of materials to be managed and the general procedures for spill control and storage of hazardous materials anticipated to be handled during the proposed project and alternatives construction activities.

Types of Hazardous Materials

A Hazardous Materials Business Plan would be put in place to control the different types of hazardous materials that are anticipated to be used during the construction activities. These materials would include:

- Transformer oil
- Dielectric fluids
- Fuels (diesel, gas)
- Lube oils and grease
- Used oil
- Solvents, coatings, and paints
- Compressed gas
- Propane
- Sulfur hexafluoride (dielectric medium)

Other hazardous materials could include the equipment and structures that would be removed as part of the proposed construction activities, as described below and in Section 2.2.2. Additionally, the applicant will be required to comply with BLM's Weed Control Plan, which requires the use of biocides and herbicides to control invasive species. The applicant would develop Hazardous Materials Business Plans for proper control of health and safety concerns. The hazardous materials controls proposed by the applicant would include Material Safety Data Sheets labeling, classification, storage, usage information, incidental spill cleanup, recycling, and waste management.

Transformer Removal

The proposed upgrades at Eldorado Substation would require removal of the existing 230/115-kV transformer, which would be placed in emergency stock or salvaged for reuse. Transformer removal would involve a sequence of activities: (1) oil testing for PCB identification, (2) oil removal and disposal/recycle by specialized contractors, (3) disconnection of all primary and secondary conductors, (4) installation of cap plates to cover bushings mount holes on transformers, (5) removal of all hazardous materials from control cabinets, (6) removal of welded end bed plates, and (7) transportation and shipping to emergency stock or salvage storage room.

Structure Removal

A list of structures ~~and line hardware~~ that would be removed from the existing 115-kV system to construct the proposed Eldorado–Ivanpah transmission line is given in Table 2-5. The structures and hardware would be disassembled into manageable pieces or sections and placed into roll-off boxes or bins for transportation to an approved salvage contractor. Wooden poles and H-frames would be collected in separate containers and transported to an approved disposal facility.

Spill Response

The construction contractor would supply spill response kits and contact information in case of accidents. The applicant's transmission and distribution environmental and safety specialists would provide assistance for further evaluation and support. If substantial spills occurred, the applicant would also involve environmental response contractors. Prevention methods during refueling would minimize any impacts; these methods would include using trained personnel, observing operations, and using refueling pads.

The applicant or its contractor would utilize an on-site fueling contract service to fuel the construction vehicles and equipment for the project. It is anticipated that one or two fueling trucks would be used for EITP construction, with capacities ranging from 4,000 to 7,000 gallons per truck. These trucks would have separate holding tanks for gas and diesel, and are able to dispense both types of fuel. All fueling trucks would maintain on-board fuel spill plans and containment kits.

Waste Management

Hazardous materials and solid waste would be stored in accordance with regulatory requirements and applicable standard procedures, such as the applicant's Salvage Services Manual and Waste Management Plan. The applicant would use proper storage cabinets and designated areas at substations, construction yards, and laydown areas. Waste identification, characterization, profiling, packaging, labeling, and transportation to proper disposal sites would be implemented in compliance with the applicant's waste management procedures. Additionally, the applicant would have contracts in place with approved waste contractors and landfill disposal sites prior to commencement of construction activities.

2.5 Operation and Maintenance Procedures

After construction of all project components, the applicant would operate and maintain project facilities and equipment in accordance with the applicant's standard operational procedures and applicable federal and state regulations. The proposed project components would be unstaffed; continuous operations and monitoring would be provided through control and communication systems. Routine maintenance of the proposed project (and alternatives) would occur at least once a year and would involve activities and features related to project components, as described below.

2.5.1 Powerlines

Recurring maintenance activities of the proposed transmission, subtransmission, and distribution lines would occur at least once per year. These 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 routine inspection and maintenance activities would depend on several variables, including the length of the line and weather effects. If the magnitude of repairs identified by routine patrols were substantial, other specialized employees such as surveyors, engineers, clerical personnel, and technicians would be added to maintenance crews, as required, to address any unique problem that might arise such as substantial storm damage or vandalism. Routine inspection and maintenance personnel categories would include senior patrolman, foreman, lead lineman, journeyman lineman, apprentice, groundman, helicopter pilot, equipment operator, and laborer.

The entire proposed transmission line corridor would be patrolled at least annually. The patrols would alternate between helicopter and truck. In the first year, the corridor would be patrolled by helicopter, which would take approximately 1 day (8 hours) to accomplish. The next year, a truck patrol would take 5 days. Increases in pollution and population density in the vicinity of the proposed transmission line corridor could lead the applicant to increase the patrol frequency. These additional patrols would be performed by helicopter or patrol truck.

During a typical patrol, a helicopter would fly at or near the elevation of the support for the conductor. In populated areas, patrols would fly at higher elevations or away from the centerline of the transmission lines to avoid flying close to houses or penned animals. In cases where flying near a populated area could not be avoided, the patrolman would use gyrobinoculars 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 would not be restricted except for safety and environmental reasons.

Helicopter operations would be supported by local airports, such as the Jean Sport Aviation Center and the proposed Southern Nevada Supplemental Airport (currently in planning phase; see Chapter 5). Before any helicopter operations would occur for the EITP operations and maintenance, the applicant would be required to coordinate with the CCDOA and/or the FAA.

Approximately 15 years after the initial operational date, maintenance on the proposed transmission 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 aged on the line, the frequency of lattice steel structure hardware maintenance activities such as bolt torquing would increase.

Water would not be utilized during routine operation and maintenance of the transmission line. Since polymer insulators are being proposed on the structures for the EITP, line cleaning or washing would not be needed.

2.5.2 Substations

Considering the EITP's specific features and the typical climate conditions of the proposed project area (desert), the Ivanpah Substation would require 14 visits per year for operational activities, and 20 to 25 visits per year for maintenance.

Operation of the Ivanpah Substation would require use of electric, fuel, transportation, solid waste, and communication services. Electric service would be provided by the two distribution systems described in Section 2.2.1.3. Leased and internal phone communication line services would be also required. In addition, an emergency backup generator would be placed at the microwave communication site; it would store 499 gallons of liquefied petroleum gas (LPG)~~fuel~~.

Currently, the applicant does not anticipate the need for a permanent water supply at the Ivanpah Substation during operations. The applicant is evaluating options for a portable or permanent self-contained restroom facility for use during operation and maintenance activities. Either restroom facility would have a self-contained holding tank and the wastewater would be disposed of by contract service personnel. During construction, the site would be serviced by portable restroom facilities and the wastewater would be disposed of weekly or more frequently depending on the number of construction personnel and usage. The physical location and type (portable or permanent) of self-contained restroom facilities would be determined during final engineering.

Solid waste handling and disposal procedures at the substation sites would be conducted as specified in the applicant's Waste Disposal Plan, the Salvage Services Manual, and the Waste Management Manual. In addition, the applicant would have contracts in place with approved waste contractors and landfill disposal sites prior to commencement of construction activities.

Hazardous materials that might be used during operations and maintenance at the project substations would include transformer oil, dielectric fluids used in capacitors, fuels (diesel and gas), lube oils and grease, used oil, propane, sulfur hexafluoride (SF_6) gas, compressed gases such as argon and nitrogen, and solvents, coatings, and paints. Additionally, any piece of equipment or structure removed as part of operations and maintenance might be hazardous waste. The applicant would manage, control, and dispose of all potentially hazardous materials generated as a result of project operations and maintenance in accordance with applicable regulatory requirements and standard procedures.

The applicant currently does not have a SF_6 gas recovery plan. However, the applicant follows the current industry practice of utilizing an alarm system that monitors the density of SF_6 gas in a circuit-breaker. If the density level decreases to a predetermined level, an alarm is sent to responsible personnel. Under this procedure, the applicants' maintenance personnel are notified and respond to the alarm. The corrective action would include evacuating the remaining SF_6 gas to containers, repairing the leak or replacing the leaking components, and refilling the breaker with SF_6 gas.

Specialized personnel would visit the new Ivanpah Substation to conduct routine maintenance activities. Current regular maintenance activities at the existing Eldorado Substation would also continue after the proposed upgrades. Other visits to the substation might be required to support repairs, outages, and other related work activities as required by maintenance, testing, and engineering personnel. The applicant would mobilize vehicles from other locations to the Ivanpah Substation for both routine and emergency maintenance activities, as required.

2.5.3 Telecommunication System

Maintenance personnel would conduct routine maintenance for the proposed telecommunication equipment and facilities, including the microwave communication site, the emergency generator, and the MEER at the Ivanpah Substation. Other visits to the telecommunication facilities would be necessary if repairs were needed, there were equipment or network faults, or other related work was needed.

Routine maintenance to the telecommunication facilities at the Ivanpah Substation would be performed once a year. In addition, the following maintenance activities would be performed once a year at the proposed microwave site in Nipton:

- Telecom equipment
- Propane tank refuel (contractor)
- Air-conditioning service (contractor)
- Building maintenance (contractor)

2.5.4 Decommissioning

A transmission system's lifetime usually exceeds 80 years with proper maintenance. As mentioned above, approximately 15 years after the operational date, the frequency of maintenance on the proposed line would be expected to increase. In addition, the applicant would implement a regular program to replace damaged structure hardware.

The applicant would maintain the project over its lifetime in accordance with the timeframe to be established by the BLM in the ROW grant. The BLM typically grants a 30 year ROW with a right of renewal for generation and transmission facilities. Within a reasonable time following termination of the BLM ROW grant, the applicant would prepare a removal and restoration plan prior to decommissioning of the facilities. The removal and restoration plan would address removal of the applicant's 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.

2.6 Cumulative Projects

Based on the requirements of both CEQA and NEPA, this Draft EIR/EIS includes a cumulative impact analysis in Chapters 5 and 6. NEPA (40 CFR Section 1508.7) defines a cumulative impact as "the impact on the environment which results from the incremental impact of the project when added to other past, present, and reasonably foreseeable future actions." Under CEQA, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." The discussion of cumulative impacts presented in Chapter 5 is based on whether incremental effects of a project combined with the effects of other projects are considered as "cumulatively considerable."

The analysis of cumulative impacts is based on a number of variables including geographical and time boundaries, features of each project under consideration, and characteristics of each resource. Actions considered as part of the cumulative analysis provided in this Draft EIR/EIS include those projects that are reasonably foreseeable and that would be constructed or commence operation during the proposed project timeframe. Based on these criteria, projects included in the cumulative analysis comprise the following categories:

- Completed projects
- Projects approved and under construction
- Projects approved but not yet under construction
- Projects proposed but not yet approved

A detailed list of projects by several economic sectors is presented in Chapter 5. Main development sectors include renewable energy, utilities, mining, recreation, and restoration and conservation. Potentially significant adverse impacts resulting from the contribution of cumulative actions would be required to be reduced, avoided, or minimized through the application of mitigation measures.

2.7 Applicant Proposed Measures

The applicant has included the following applicant proposed measures (APMs) to avoid or minimize impacts of the proposed EITP or its alternatives on environmental resources. These APMs are part of the EITP and are distinguished from mitigation measures for potentially significant impacts under CEQA and NEPA. If the proposed EITP (or any of its alternatives) is approved, the applicant will implement the APMs listed in Table 2-24 regardless of whether potential significant impacts were identified during the environmental analysis under this EIR/EIS.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
Aesthetics	
APM 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, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.
APM 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 would blend back into the overall landscape context.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM AES-3: Non-Reflective Finish	LSTs and TSPs would be constructed of steel that was galvanized and treated at the factory to create a dulled finish that would 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.
APM 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 them to an appearance that would blend back into the overall landscape context.
APM AES-5: Use Existing Access Roads	To the extent feasible, existing access roads would be used.
APM AES-6: Minimize Road Modifications**.**	Widening and grading of roads would be kept to the minimum required for access by proposed project construction equipment.
APM 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.
APM 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 offsite light spill at times when the lighting might be in use.
Air Quality	
	The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulation.
Biological Resources	
APM BIO-1: Preconstruction Surveys	Preconstruction biological clearance surveys would be conducted by qualified biologists to identify special-status plants and wildlife.
APM BIO-2: Minimize Vegetation Impacts	Every effort would be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation would be flagged for avoidance.
APM BIO-3: Avoid Impacts on State and Federal Jurisdiction Wetlands	Construction crews would avoid impacting the streambeds and banks of streams along the route to the extent possible. As applicable, the necessary permits would be obtained from the appropriate agencies. Impacts would be mitigated based on the terms of the permits. No streams with flowing waters capable of supporting special-status species would be expected to be impacted by the proposed project.~~Construction crews would avoid impacting the streambeds and banks of streams along the route to the extent possible. If necessary, an SAA would be secured from the CDFG. Impacts would be mitigated based on the terms of the SAA. No streams with flowing waters capable of supporting special-status species would be expected to be impacted by the proposed project.~~
APM BIO-4: Best Management Practices	Crews would be directed to use Best Management Practices (BMPs) where applicable. These measures would be identified prior to construction and incorporated into the construction operations.
APM BIO-5: Biological Monitors	Biological monitors would be assigned to the project in areas of sensitive biological resources. The monitors would be responsible for ensuring that impacts on special-status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities would need to be restricted in order to protect native plants and wildlife or special-status species. Those restricted areas would be monitored to ensure their protection during construction.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-6: Worker Environmental Awareness Program	A Worker Environmental Awareness Program (WEAP) would be prepared. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would 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 would be maintained.
APM BIO-7: Avoid Impacts on Active Nests	SCE would 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 needed to be removed during the nesting season, or if work was scheduled to take place in close proximity to an active nest on an existing transmission or subtransmission tower or pole, SCE would coordinate with the USFWS, CDFG, and/or the NDOW as appropriate to obtain written verification prior to moving the nest.
APM BIO-8: Avian Protection	All transmission and subtransmission towers and poles would 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 (APLIC 2006).
APM BIO-9: Facility Siting	Final tower and spur road locations would be adjusted to avoid sensitive biological resources to the greatest extent feasible.
APM BIO-10: Invasive Plant Management	An invasive plant management plan would be developed to reduce the potential for spreading invasive plant species during construction activities.
APM BIO-11: Desert Tortoise Measures	• The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. Additionally, compliance discussions with Clark County and Boulder City must occur prior to construction that resolve and outline the specific compensation fees or additional mitigation measures needed for loss of desert tortoise habitat. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC. • A field contact representative would be designated and would oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The field contact representative would 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 would be conspicuously staked, flagged, or marked to minimize surface disturbance activities. All workers would strictly limit activities and vehicles to the designated work areas. • Crushing/removal of perennial vegetation in work areas would be avoided to the maximum extent practicable. • All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens. • Pets would not be allowed in working areas unless restrained in a kennel. • Where possible, motor vehicles would be limited to maintained roads and designated routes.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-11: Desert Tortoise Measures (Cont.)	• Vehicle speed within the project area, along ROW maintenance routes, and along existing access roads would not exceed 20 miles per hour. Speed limits would be clearly marked and all workers would be made aware of these limits. • Constructed road berms would be less than 12 inches in height and have slopes of less than 30 degrees. • Construction monitoring would 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) would be present during all activities in which encounters with tortoises could 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 USFWS 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). • Preconstruction clearance surveys would be conducted within 48 hours of initiation of site-specific project activities, following USFWS protocol (USFWS 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 would cover 100% of the acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity would be marked. Tortoise burrows would be avoided to the extent practicable, but would be excavated if they would be crushed by construction activities. • Any tortoise found on the surface would be relocated to less than 1,000 feet away. Tortoises would be handled carefully following the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises would be handled with new latex gloves each time to avoid transmission of disease, and handlers would especially note guidelines for precautions to be taken during high-temperature periods. • If a potential tortoise burrow were required to be excavated, the biologist would proceed according to the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises removed from burrows would be relocated to an artificial burrow (Desert Tortoise Council 1999). The entrance of the artificial burrow would be blocked until construction activities in the area were 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 might occur would be monitored by a qualified or authorized biologist. The biologist would be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The qualified or authorized biologist would 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 was minimized.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-11: Desert Tortoise Measures (Cont.)	• No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) would be left unfenced or uncovered; such hazards would be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term project areas would be enclosed with tortoise-proof fencing. Fencing would be removed when restoration of the site was completed. • Any incident occurring during project activities which was considered by the biological monitor to be in non-compliance with the mitigation plan would be documented immediately by the biological monitor. The field contact representative would ensure that appropriate corrective action was taken. Corrective actions would be documented by the monitor. The following incidents would 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 was required. If the monitor and field contact representative did not agree, the federal agency's compliance officer would be contacted for resolution. All parties could refer the resolution to the federal agency's authorized officer. • Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed. • All construction personnel, including subcontractors, would undergo a WEAP. This instruction would 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 would be inspected prior to being moved. If a tortoise were found beneath a vehicle, the authorized biologist would be contacted to move the animal from harm's way, or the vehicle would not be moved until the desert tortoise left of its own accord. The authorized biologist would be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner was not exposed to temperature extremes that could be harmful to the animal. • Should any desert tortoise be injured or killed, all activities would be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist would be responsible for reporting the incident to the authorizing agencies. • A report to the USFWS would be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises would be reported.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM BIO-11: Desert Tortoise Measures (Cont.)	• The applicant would implement a Raven Management Program that would consist of: (1) an annual survey to identify raven nests on towers; and any tortoise remains at tower locations; this information would be relayed to the BLM so that the ravens and/or their nests in these towers could be targeted for removal; (2) SCE making 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. • ~~The applicant would implement a Raven Management Program that would consist of: (1) an annual survey to identify any tortoise remains at the base of the towers; this information would be relayed to the BLM so that the ravens and/or their nests in these towers could be targeted for removal, (2) SCE making 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.~~
APM BIO-12: Desert Bighorn Sheep Measures	• The applicant would consult with the BLM, USFWS, and NDOW regarding conservation measures to avoid impacts on desert bighorn sheep during construction. Project areas with the potential to impact bighorn sheep include the proposed transmission line route through the McCullough Range and the telecommunication route segment in the southern Eldorado Valley between the Highland Range and the Southern McCullough Range. Avoidance and minimization measures could include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn sheep active seasons. Construction requiring the use of helicopters would 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 Range (June through September).[11] • ~~The applicant would consult with the BLM, USFWS, and NDOW regarding conservation measures to avoid impacts on desert bighorn sheep during construction. Project areas with the potential to impact bighorn sheep include the proposed transmission line route through the McCullough Mountains and the telecommunication route segment in the southern Eldorado Valley between the Highland Range and the Southern McCullough Mountains. Avoidance and minimization measures could include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn sheep active seasons. Construction requiring the use of helicopters would 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).~~
APM BIO-13: Western Burrowing Owl Measures	Where project ground-disturbing activities would 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, would be thoroughly inspected by a qualified biologist before collapsing. This would discourage owls from breeding on the construction site. Other species using burrows would be relocated prior to collapsing burrows. If construction were to be initiated after the commencement of the breeding season and burrowing owls could be seen within areas to be affected by ground construction activities, behavioral observations would be done by a qualified biologist to determine their breeding status. If breeding were observed, the nest area would be avoided, with an appropriately sized buffer sufficient to prevent

[11] The date of bighorn lambing season has been amended per MM BIO-13 to be January to May.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
	disturbance during construction activities until the chicks fledged.
APM BIO-14: Gila Monster and Chuckwalla Measures	The following measures are the current 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, and applicable for the chuckwalla in the Nevada section 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 them from other lizards such as chuckwallas and banded geckos; (2) report any observations of Gila monsters (in Nevada) to the 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 harm's way on the construction site would 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) would 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 would not be covered by NDOW. However, NDOW would be immediately notified during normal business hours. If an animal is killed or found dead, the carcass would 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) would 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) would be provided to NDOW. Pictures would 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).

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
Cultural Resources	
APM CR-1: Conduct Archaeological Inventory of Areas that May Be Disturbed	Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the proposed project. A complete cultural resources 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, the applicant would ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys would be conducted and documented according to applicable laws, regulations, and professional standards.
APM CR-2: Avoid and Minimize Impacts on Significant Cultural Resources Wherever Feasible	Avoid and minimize impacts on significant or potentially significant cultural resources wherever feasible. To the extent practical, the applicant would avoid or minimize impacts on archaeological resources, regardless of its CRHR or NRHP eligibility status. This includes siting all ground-disturbing activities and other project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the right-of-way.
APM CR-2a. Avoid Direct Impacts on Significant Cultural Resources through Project Final Design	Project Final Design would avoid direct impacts on significant or potentially significant cultural resources. To the extent practical, all ground-disturbing activities and other project components would be sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.
APM CR-2b. Conduct a Preconstruction Worker Environmental Awareness Program (see BIO-6, PALEO-3, and W-11)	The program would be presented to 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 would be involved in ground-disturbing activities without having participated in the Worker Environmental Awareness Program.
APM CR-2c. Protective Buffer Zones	Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the right-of-way. A protective buffer zone would be established around each recorded archaeological site and treated as an "environmentally sensitive area" within which construction activities and personnel are not permitted. Monitoring would be conducted to ensure that the protective areas are maintained.
APM CR-3. Evaluate Significance of Unavoidable Cultural Resources	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 would be evaluated to determine their historical significance. Evaluation studies would be conducted and documented according to applicable laws, regulations, guidelines, and professional standards.
APM CR-3a. Evaluate Significance of Potentially Eligible Archaeological Resources	Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing. Evaluation of archaeological sites could 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 would be evaluated to consider their eligibility per CRHR Criterion 1 and NRHP Criteria A, C, and D.
APM CR-3b. Evaluate Significance of Potentially Eligible Buildings and Structures	Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation would take into account engineering, aesthetic, architectural, and other relevant attributes of each property. Buildings and structures would 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 would be prepared providing a rationale for an

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
	assessment of significance consistent with professional standards and guidelines. The report would be filed with the appropriate Information Center of the California Historical Resources Information System.
APM CR-3c. Assist with Native American Consultations	If necessary, the applicant would 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. The applicant would assist the BLM during consultation with Native Americans regarding Native American cultural remains.
APM CR-4. Minimize Unavoidable Impacts on Significant Cultural Resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties	The applicant would 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 on significant cultural resources. Impacts on significant cultural resources would be minimized by implementing the measures listed in APM CR-4a.
APM CR-4a. Implement Measures to Minimize Impacts on Significant Archaeological Sites	Prior to construction and during construction, the following measures would be implemented by the applicant to minimize unavoidable impacts on significant archaeological sites: • To the extent practical, all activities would minimize ground surface disturbance within the bounds of significant archaeological sites, historical resources, or historic properties. • Portions of significant archaeological sites, historical resources, or historic properties that can be avoided would be protected as environmentally sensitive areas and would remain undisturbed by construction activities. • Monitoring by qualified professionals and/or Native Americans to ensure that impacts on sites are minimized would 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 would be carried out at appropriate sites to ascertain whether project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials. • If impacts on significant archaeological (NRHP- or CRHR-eligible) sites eligible under NRHP Criterion D or CRHR Criterion 4 cannot be avoided, archaeological data recovery would be carried out in the portions of affected significant sites that would be impacted. A data recovery plan would 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 eligibility research questions for CRHR Criterion 4 or NRHP Criterion D. Archaeological data recovery would 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 would be filed with the BLM and the appropriate Information Center of the California Historical Resources Information System.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM CR-4b. Implement Measures to Minimize Impacts on Significant Buildings and Structures	Prior to construction and during construction, the applicant would implement the following measures to minimize unavoidable impacts on significant buildings and structures: • Locate proposed project facilities to minimize effects on significant buildings or structures. • If impacts on significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with the documentation standards of the National Park Service Historic American Buildings Survey/Historic American Engineering Record. • File reports and other documentation with the BLM, the National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.
APM 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, the applicant would prepare a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan to be implemented if an unanticipated discovery is made. At a minimum the plan would detail the following elements: • Worker and supervisor training in the identification of cultural remains that could be found in the proposed project area, and the implications of disturbance and collection of cultural resources pursuant with the Archaeological Resources Protection Act of 1979 • 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 about the potential significance of any find • Identities of persons authorized to stop or redirect work that could affect the discovery, and their on-call contact information • Procedures for monitoring construction activities in archaeologically sensitive areas • A minimum radius around any discovery within which work would 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 a discovery • Procedures for consulting Native Americans when identifying and evaluating the significance of discoveries involving Native American cultural materials • Procedures to be followed for treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans.
APM CR-6. Inadvertent Discovery of Human Remains	Any human remains discovered during project activities in California would 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 would be treated under the appropriate State of Nevada statutes, including but not limited to Nevada Revised Statutes Chapter 440 and the regulations of the applicable land management agency. In the event that human remains are recovered on private lands, the landholder would have the right to designate the 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 are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains would be

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
	treated as defined in the Construction Monitoring and Unanticipated Cultural Resources Discovery Plan.
APM CR-7. Native American Participation	Prior to construction, BLM would consult with Native Americans identified by the NAHC as having cultural ties to particular areas of the proposed project. Native Americans would be invited to participate in significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, as well as in monitoring during project construction. Native Americans would be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during project activities.
Geology, Soils, Minerals, and Paleontology	
APM GEO-1: Geotechnical Engineering and Engineering Geology Study	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: Recommended Practices for Seismic Design of Substations	For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronics Engineers (IEEE) Standards Association Standard 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.
APM GEO-3: Project Construction Stormwater Pollution Prevention Plan Protection Measures Regarding Soil Erosion / Water Quality	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 stormwater pollution prevention plan (SWPPP). New access roads would be designed to minimize ground disturbance from grading. They would follow natural ground contours as closely as possible, and would include specific features for road drainage. Measures could include water bars, drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings would be constructed, they would be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.
APM PALEO-1: Retention of Paleontologist and Preparation of a Paleontological Resource Management Plan	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 APMs PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine whether 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 could be found in the PRMP.
APM PALEO-2: Pre-construction Paleontological Field Survey	The paleontologist and/or his or her designated representative would 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.
APM PALEO-3: Worker Environmental Awareness Program (see BIO-6, CR-2b, W-11)	A Worker Environmental Awareness Program 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.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM 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 would 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 were not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities had reached a depth 5 feet below the present ground surface and fine-grained strata were 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 were present.
APM PALEO-5: Recovery and Testing	If fossils were 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 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 were 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: 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 would be submitted for analysis.
APM PALEO-7: Analysis of and Preparation of Final Paleontological Resource Recovery Report	The project paleontologist would direct identification, laboratory processing, cataloging, 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.
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 final Paleontological Resource Recovery Report in a timely manner following construction.
Hazards, Health and Safety	
APM HAZ-1: Phase I ESA	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 ESAs would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to a company that specializes in this type of work and that would produce a comprehensive report for the new or expanded ROW. The comprehensive report is used to identify sites in federal, state, and local government agency databases that may have the potential to impact the proposed project; based on a review of the report, any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I ESA that is compliant with American

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
	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 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.
APM HAZ-2: Hazardous Materials and Waste Handling Management Plan.	The applicant would develop programs and policies for management of hazardous materials including a Hazardous Materials and Hazardous Waste Handling Program, Construction Stormwater Pollution Prevention Plan, and procedures for Transport of Hazardous Materials, Fueling and Maintenance of Construction Equipment, Fueling and Maintenance of Helicopters, and Emergency Release Response. This plan would be valid during project construction and operation.
APM HAZ-3: Soil Management Plan	The applicant would develop a Soil Management Plan that would provide guidance for the proper handling, onsite management, and disposal of impacted soil that might be encountered during construction activities. This plan would be valid during project construction and operation.
APM HAZ-4: Fire Management Plan	The applicant would implement a Fire Management Plan.
APM HAZ-5: SPCCP and Hazardous Materials Business Plan	The applicant would implement a Spill Prevention, Countermeasure, and Control Plan (SPCCP) for preventing, containing, and controlling potential releases; provisions for quick and safe cleanup and a Hazardous Materials Business Plan (HMBP) that would include hazardous waste management procedures; and emergency response procedures including emergency spill cleanup supplies and equipment.
Hydrology and Water Quality	
APM W-1: Avoid Stream Channels	Construction equipment would be kept out of flowing stream channels.
APM W-2: Erosion Control and Hazardous Material Plans	Erosion control and hazardous material plans would be incorporated into the construction bidding specifications to ensure compliance.
APM W-3: Project Design Features	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, would 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.
APM W-4: Avoid Active Drainage Channels	Towers would 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	Diversion dikes would be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) could not 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: Collect and Divert Runoff	Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes.
APM W-7: Ditch and Drainage Design	Ditches and drainage devices would be designed to handle the concentrated runoff and located to avoid disturbed areas. They would have energy dissipations at discharge points that might include rip-rap, concrete aprons, and stepped spillways. 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.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
APM W-8: Minimize Cut and Fill Slopes	Cut and fill slopes would 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 would 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. BMPs in the project SWPPP would be implemented during construction to minimize the risk of an accidental release.
APM W-10: Emergency Release Response Procedures	The Emergency Release Response Procedures developed pursuant to APM Haz-1 would be maintained onsite (or in vehicles) during construction of the proposed project.
APM W-11: Conduct a Worker Environmental Awareness Program (see BIO-6, CR-2b, PALEO-3)	A Worker Environmental Awareness Program (WEAP) would be conducted 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 would emphasize site-specific physical conditions to improve hazard prevention. It would 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. The applicant would document compliance and maintain a list of names of all construction personnel who had completed the training program.
APM W-12: Properly Dispose of Hazardous Materials	All construction and demolition waste, including trash and litter, garbage, and other solid waste, would be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials would be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
APM W-13: Identify Location of Underground Utilities Prior to Excavation	Prior to excavation, the applicant or its contractors would 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	The applicant would prepare or update SPCC plans for substations to minimize, avoid, and/or clean up unforeseen spill of hazardous materials during facility operations.
Land Use	
APM LU-1: Aeronautical Considerations	The applicant would submit notice to FAA electronically, in accordance with FAA procedures, and as far in advance of construction as possible.
Noise	
APM 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 to take advantage of low electrical draw periods during the nighttime hours. The applicant would comply with variance procedures requested by local authorities if required.
APM NOI-2: Construction Equipment Working Order	Construction equipment would be in good working order.
APM NOI-3: Construction Equipment Maintenance	Construction equipment would be maintained per manufacturer's recommendations.
APM NOI-4: Construction Equipment Muffled	Construction equipment would be adequately muffled.
APM NOI-5: Construction Equipment Idling Minimized	Idling of construction equipment and vehicles would be minimized during the construction.
APM NOI-6: Hearing Protection for Workers	Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan.

Table 2-24 Applicant Proposed Measures

Applicant Proposed Measure	Description
Public Services and Utilities	
APM 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.
APM 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.
Recreation	
APM REC-1: Recreation Area Closures	When temporary short-term closures to recreational areas are necessary for construction activities, the applicant would coordinate those closures with recreational facility owners. To the extent practicable, the applicant would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). The applicant would post notice of the closure on-site 14 calendar days prior to the closure.
Socioeconomics, Population and Housing, and Environmental Justice	
	The applicant has not included any APMs related to socioeconomics, population and housing, or environmental justice for the proposed EITP.
Traffic and Transportation	
APM 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.
APM 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.
APM TRA-3: Minimize Street Use	Construction activities will be designed to minimize work on, or use of, local streets.

Key:
ASTM = American Society for Testing Materials
BLM = Bureau of Land Management
BMP = Best Management Practices
CDFG = California Department of Fish and Game
CPUC = California Public Utilities Commission
CRHR = California Register of Historical Resources
EITP = Eldorado–Ivanpah Transmission Project
FAA = Federal Aviation Administration
GPS = Global Positioning System
HMBP = Hazardous Materials Business Plan
LST = Lattice Steel Tower
NAHC = Native American Heritage Commission
NDOW = Nevada Department of Wildlife
NRHP = National Register of Historic Places
PRMP = Paleontological Resource Management Plan
ROW = Right-of-Way
SAA = Streambed Alteration Agreement
SCE = Southern California Edison
SPCC = Spill Prevention, Control, and Countermeasure
SPCCP = Spill Prevention, Control, and Countermeasure Plan
SWPPP = Stormwater Pollution Prevention Plan
TSP = Tubular Steel Poles
USFWS = U.S. Fish and Wildlife Service
WEAP = Worker Environmental Awareness Program

3. Environmental Analysis

3.1 Introduction to Environmental Analysis

Chapter 3 describes existing (baseline) environmental conditions within the proposed project area by resource/factor and evaluates potential impacts on these resources that could result from activities associated with the proposed project and its alternatives. The environmental resource issues examined in sections within this ~~Draft~~ Environmental Impact Report/Environmental Impact Statement (EIR/EIS) are as follows:

- Aesthetics and Visual Resources;
- Air Quality and Greenhouse Gases;
- Biological Resources;
- Cultural Resources;
- Geology, Soils, Minerals, and Paleontology;
- Hazards, Health, and Safety;
- Hydrology and Water Quality;
- Land Use, Grazing Allotments, and Designated Areas;
- Noise and Vibration;
- Public Services and Utilities;
- Recreation;
- Socioeconomics, Population and Housing, and Environmental Justice; and
- Traffic and Transportation

The environmental analysis for each resource topic includes a discussion of all issues raised during the public scoping period from July 27, 2009, to August 26, 2009. The analysis also reflects comments and suggestions made through consultation with federal, state, and local agencies, including the United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and National Historic Preservation Council (NHPC) for both California and Nevada. <u>The analysis also reflects changes made based on comments received during the public comment period from April 30, 2010, to June 26, 2010.</u> Also presented by resource topic are Applicant Proposed Measures (APMs) and mitigation measures for identified impacts.

Each Chapter 3 resource section includes the following subsections:

- Environmental Setting;
- Applicable Laws, Regulations, and Standards;
- Impact Analysis, including the following: NEPA Impact Criteria, CEQA Impact Criteria, Methodology, Applicant Proposed Measures, Proposed Project, and all Alternatives;
- Mitigation Measures; and
- Whole of the Action / Cumulative Action (emphasizing Ivanpah Solar Electric Generating System [ISEGS] project)

The analysis of potential cumulative effects in conjunction with other past, planned, or reasonably foreseeable projects is described in Chapter 5, "Cumulative Scenario and Impacts."

3.1.1 Regulatory Framework

Existing laws, regulations, and standards may affect the proposed project in terms of its location, duration, footprint, discharges, and work practices. Laws and regulations may also specify permits and benchmarks necessary for project authorization or evaluation and necessitate agency consultation. Laws, regulations, and permits may come from federal, state, or local bodies and agencies. Sections 3.2 through 3.14 identify applicable laws and regulations for each resource topic; additionally, Table 1-2 in Section 1.2 of this document identifies major permits, approvals, and consultations that would typically be required for a project of this nature.

3.1.1.1 State and Federal Requirements for the EIR/EIS

This document has been prepared to comply with the California Environmental Quality Act (CEQA), the State Guidelines (California Code of Regulations, Title 14, Section [§] 15000 et seq.), the National Environmental Policy Act (NEPA) of 1969, and the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508).

3.1.1.2 Information Requirements under CEQA and NEPA

State regulations implementing CEQA (CEQA Guidelines §15222) strongly encourage cooperation with the lead federal agency in preparation of a joint environmental document. Federal regulations implementing NEPA (40 CFR 1502(b)) encourage cooperation and preparation of joint federal and state environmental documents to reduce duplication. This document was designed to satisfy the requirements of both CEQA and NEPA; where possible, the discussion of potential impacts on each environmental resource area under CEQA and NEPA was combined. For example, each resource section contains one consolidated existing setting section. However, there are differences in the requirements of, approach to, and terminology used under CEQA and under NEPA, as described below. Because of these differences, while redundancy was avoided to the greatest extent possible, priority was placed on fulfilling the requirements of both the state and federal acts.

Although information requirements are not specifically prescribed, NEPA requires a project description. Section 1502.14(b) of the CEQ regulations requires "substantial treatment of each alternative considered in detail including the proposed action." This regulation does not dictate an amount of information to be provided, but rather prescribes a level of treatment, which may in turn require ~~varying~~ various amounts of information~~,~~ to facilitate a comparison of the project as proposed and its alternatives.

The analysis of each environmental resource area begins with an examination of the existing physical environmental conditions that may be affected by the proposed project. The effects of the project are defined as changes to the existing environmental conditions that are attributable to project construction, components, or operation. The analysis for each environmental resource area then offers a comparative analysis for each of the project alternatives, including the No Project Alternative.

The State CEQA Guidelines §15125(a) state in part:

> An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published … from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives.

In reference to alternatives, the State CEQA Guidelines §15126.6(a) state:

> An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which 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.

Due to the similarity in information requirements for both NEPA and CEQA, the existing conditions setting, which describes the environmental conditions that may be affected by the project, serves both purposes. However, because NEPA requires a comparison of alternatives to facilitate agency decision-making and CEQA requires an analysis of only those alternatives that would substantially lessen one or more significant impacts, the analysis of alternatives differs in this section under NEPA and CEQA.

If information is incomplete or unavailable, NEPA permits this uncertainly; 43 CFR 1502.22(b) states that the EIS must include: (1) a statement that such information is incomplete or unavailable, (2) a statement of the relevance of the incomplete or unavailable information in evaluating reasonably foreseeable significant adverse impacts on the human environment, (3) a summary of existing credible scientific evidence that is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community. The State CEQA Guidelines discuss forecasting in §15144: "Drafting an EIR or preparing a Negative Declaration necessarily involves some degree of forecasting. While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can." However, §15145 of the State CEQA Guidelines states: "If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." Instances where information is incomplete or unavailable are noted in the document.

3.1.2 Organization of the Environmental Analysis

The contents of each resource area subsection are described below. Depending on the nature of a resource, organization and content within each subsection may vary, but each section was written to satisfy the requirements of NEPA and CEQA. These sections assess and disclose the impacts of the project and its alternatives to all required and potentially impacted resources in the project area.

3.1.2.1 Environmental Setting

A consolidated environmental setting section serves the purposes of both NEPA and CEQA for each resource area discussed in this chapter. The environmental setting of the project area is described using information from literature reviews, fieldwork, and input from appropriate federal, state, and local agencies. Understanding these conditions (such as existing air quality, population growth trends, and recreational opportunities) allows for characterization and anticipation of the proposed project's impacts, and forms a basis for the environmental analysis. Sources for the literature reviews included published technical reports, internet resources, data from government sources, aerial photographs, and information provided by the applicant. Where existing information on the project area was insufficient or outdated or where surveys or studies were specifically required by jurisdictional agencies, surveys and studies were conducted to determine the existing environmental conditions. This work included geotechnical, cultural resources, biological, visual, and wetland delineation surveys.

3.1.2.2 Applicable Laws, Regulations, and Standards

This subsection outlines the applicable laws, regulations, and standards for each resource area. All applicable federal and state laws, regulations, and standards are summarized and their applicability to the project explained. It is assumed in the analysis that the applicant will fully comply with all applicable regulations, will prepare any required plans, and will obtain any necessary permits or waivers.

Applicable local laws, regulations, and standards are included in this subsection as well; however, pursuant to California law and CPUC General Order 131D, public utilities such as Southern California Edison (SCE) are generally not subject to local discretionary action jurisdiction (Section XVI.B). CPUC General Order 131D specifically requires public utilities to consult with local agencies on land use issues, but ultimately the CPUC has the authority to permit public utility projects. This information is included for disclosure purposes. Instances where SCE may fail to comply with local laws, regulations, and standards are noted in the analysis of impacts.

3.1.2.3 Impact Analysis

NEPA Impact Criteria

In accordance with NEPA and the BLM NEPA Handbook H-1790-1 (2008), this document considers the environmental effects of the project and its alternatives. Under NEPA, an EIS is prepared when the proposed action is expected to result in significant environmental effects (BLM 2008). The intent of the environmental analysis is to provide a scientific and analytic basis for comparing the proposed project and its alternatives (40 CFR 1502.16). Impacts are quantified to the extent possible. Determination of an impact's significance is derived from standards set by regulatory agencies at the federal, state, and local levels; knowledge of the effects of similar past projects; professional judgment; and plans and policies adopted by government agencies.

To facilitate comparison of alternatives, impacts are described in terms of context, intensity, and duration. *onte t* refers to the geographic area of impact, which varies with the physical setting of the activity and the nature of the resource being analyzed. *ntensity* refers to the severity of the impact. *ation* refers to how long the impact may last, and may be either short or long term:

- Short term – effects that occur during the construction phase
- Long term – effects caused during the construction and/or operations phases that remain longer than these phases

In determining the significance of an impact under NEPA, the impact is classified as adverse or beneficial and then rated negligible, minor, moderate, or major. Generally, these terms are defined as follows:

- Negligible effects may or may not cause observable changes to baseline conditions; regardless, they do not alter the baseline conditions;
- Minor effects cause observable and temporary or short-term changes to baseline conditions in a relatively small area, but they do not alter baseline conditions in the long term;
- Moderate effects cause observable and short-term change to baseline conditions, and/or they alter baseline conditions in the long-term; and
- Major effects cause observable and substantial long-term changes to baseline conditions.

CEQA Impact Criteria

Significance criteria, as set forth in the CEQA Appendix G Environmental Checklist (Association of Environmental Professionals [AEP] 2009) and CPUC policy, are identified in this EIR/EIS for each environmental resource area. The significance criteria serve as a benchmark for determining whether a project would result in significant adverse environmental impacts when evaluated against the baseline or existing environmental conditions. Issues that were raised during the scoping process are also addressed in the relevant resources subsection throughout this EIR/EIS.

Under the CEQA criteria, potential impacts are assessed by the agency and determined to be either no impact, a less than significant impact, an impact that is less than significant with mitigation, or a significant impact. As under NEPA, determination of an impact's significance is derived from standards set by regulatory agencies on the federal, state, and local levels; knowledge of the effects of similar past projects; professional judgment; and plans and policies adopted by governmental agencies.

Methodology

This subsection describes the methodology used to determine whether and how the project and its alternatives would affect the resource. All documents reviewed, all calculations performed, and any databases, maps, or sources of information used in assessing the impact on a particular resource are described here.

Applicant Proposed Measures

The applicant has incorporated a number of measures and procedures to avoid or reduce impacts on specific environmental resources into the description of the proposed project. In the assessment of the impacts, these measures have been assumed to be part of the project, and are not included as CPUC- or BLM-required mitigation measures; however, implementation of each APM will be monitored through a Mitigation and Monitoring Program (MMP). The APMs that are intended to reduce the potential impacts in a particular resource area (such as air quality or biology) are listed in the section addressing that area.

Proposed Project

The assessment of the environmental impacts of the proposed project considers both the construction and the operation and maintenance phases of the project. The following project components are considered in the analysis of impacts on each resource:

- Powerlines, including the 35-mile 230-kV transmission line, the 1-mile 115-kV subtransmission line extension, and the approximately 1-mile segments of 12-kV and 33-kV distribution;
- Substations, including the new Ivanpah Substation and upgrades to the existing Eldorado Substation; and
- The telecommunication system, including Path 1 along the proposed transmission route and the redundant Path 2 that combines overhead optical groundwire (OPGW), undergrounded OPGW, and a microwave path.

Alternatives

Under NEPA and CEQA, a range of reasonable ~~range of~~ alternatives must be considered. NEPA requires consideration of a ~~"~~range of reasonable~~" number of~~ alternatives~~. In determining the scope of alternatives, the~~, with an emphasis ~~is~~ on the word "reasonable." "Reasonable" alternatives include those that are practical and feasible from a technical and economic standpoint and by using common sense (CEQ 40 Questions; #1). The information must be sufficient to enable reviewers and decision-makers to evaluate and compare alternatives.

State CEQA Guidelines §15126.6(a) provides, in part, that "an EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which 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, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project."

Impacts from alternatives are compared with those of the proposed project to determine their relative environmental merit and feasibility. The following alternatives, as described in Chapter 2, are analyzed in this chapter:

- The No Project / No Action Alternative
- Transmission Alternative Route A
- Transmission Alternative Route B
- Transmission Alternative Route C
- Transmission Alternative Route D
- Transmission Subalternative Route E
- The Golf Course Telecommunication Alternative
- The Mountain Pass Telecommunication Alternative

3.1.2.4 Mitigation Measures

The APMs, as described above, are considered a part of the project. If an analysis concludes the possibility of a potentially significant impact exists even after APMs are considered, both NEPA and CEQA require specific actions. Under CEQA, the analysis establishes the impact significance and determines additional required mitigation. Mitigation measures that are specified by the lead agencies to reduce any potential significant environmental impacts remaining after project modification are identified by the prefix “MM,” for example, MM VIS-1 denotes the first mitigation measure listed for visual resources.

Both §1508.20 of the CEQ regulations for implementing NEPA and the State CEQA Guidelines §15370 define mitigation as:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;[1]

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and

(e) Compensating for the impact by replacing or providing substitute resources or environments.

If it is determined that impacts would remain significant after mitigation, that is, they would continue to exceed the significance criteria, further measures may be proposed, or the impact may be determined to be significant and not mitigable.

3.1.2.5 Whole of the Action / Cumulative Action

Under CEQA, “project” is defined as “the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment” (CEQA Guidelines §15378(a)). The CPUC has determined that ISEGS, which intends to connect to EITP, constitutes a reasonably foreseeable physical change in the environment and will be analyzed as part of the “whole of the action” under CEQA.

[1] CEQA Guidelines § 15370(c) substitutes the word “impacted” for “affected.”

The BLM has determined that the ISEGS proposed project qualifies as a cumulative action to the EITP proposed project. The ~~ISEGS~~ CEC's Final Staff Assessment (FSA), FSA Addendum, Errata to the FSA Addendum, Final Decision, and Final Decision to approve the Application for Certification (overriding several significant environmental impacts) and the BLM's Final ~~Staff Assessment / Draft~~ Environmental Impact Statement ~~(FSA/DEIS) has~~ and Record of Decision determined that the ISEGS project would result in significant or adverse impacts; given the geographical proximity and the overlapping schedules of the proposed project ~~and~~ with the ISEGS project, it is reasonable to assume that the proposed EITP project, when considered in combination with ISEGS, would contribute to cumulatively significant impacts. Pursuant to CEQ regulation (40 CFR 1508.25(a)(2)), the ISEGS project will be discussed as ~~part of the~~ a cumulative action within this ~~Draft~~ EIR/EIS.

Information on the environmental setting (baseline), applicable regulations, environmental impacts, and mitigation measures required by the California Energy Commission (CEC) and the BLM for ISEGS ~~are discussed under this subsection for~~ was included in the Draft EIR/EIS for each resource evaluated in Chapter 3 for disclosure purposes and to assist agency decision-makers. Although no new impacts were identified from what was already disclosed in the Draft EIR/EIS, the EITP Final EIR/EIS has been updated to reflect changes in the ISEGS project (primarily related to the Mitigated Ivanpah 3 Alternative, which was proposed by the applicant) and to include information from documents published after the EITP Draft EIR/EIS was published (e.g., the ISEGS CEC Final Decision and the BLM ROD). The changes to the ISEGS project proposed in the Final EIR/EIS reduced the environmental impacts of the ISEGS project proposed in the Draft EIR/EIS, and the recently published information on ISEGS included in the Final EIR/EIS serves only to amplify and clarify information already presented in the Draft EIR/EIS.

3.1.2.6 Combined Impact of the EITP and ISEGS

As stated above, ~~the EIR/EIS considers the "Whole of the Action" or "Cumulative Action" of SCE's proposed EITP; the Whole of the Action / Cumulative Action includes the ISEGS project.~~ each section in Chapter 3 of this document includes a summary of the ISEGS environmental analysis, and these sections were updated from the Draft EIR/EIS to the Final EIR/EIS to reflect a reduction in acreage in the ISEGS project and to include information from documents published after the EITP Draft EIR/EIS was published. No new impacts related to the ISEGS project were identified from the EITP Draft EIR/EIS to the Final EIR/EIS. The analysis of the combined impacts of the EITP and ISEGS presented in the Draft EIR/EIS has undergone some reoroganization and/or reformmating in the Final EIR/EIS, and the summary of these aggregate impacts in the Draft EIR/EIS has been expanded in the Final EIR/EIS, to provide enhanced clarity for the public and decision makers. ~~To fully disclose the impacts of the action, this section provides an analysis of the combined impacts of the EITP and the ISEGS project.~~

3.1.3 Underlying Assumptions

The conclusions in this document are based on the analysis of potential environmental impacts and the following assumptions:

- The applicant will comply with all applicable laws and regulations;
- The applicant will contract, construct, and operate the project as described in Chapter 2, including all APMs; and
- The applicant will implement the mitigation measures as required by the CPUC and the BLM.

3.2 Visual Resources

This section contains a description of the environmental setting, regulatory setting, and potential impacts associated with the construction and operation of the proposed project and alternatives with respect to visual resources.

3.2.1 Environmental Setting

The existing environmental setting for visual resources is described in terms of the existing landscape and potential viewers. The existing environmental setting is described broadly to provide an overall context for the region in which the proposed project would be located. Representative views of the proposed locations for project components and the proposed routes for the transmission and telecommunications lines are included to support the textual description of the existing landscape; the locations from which these photos were taken are indicated in Figure 3.2-1.

Potential viewers are described in terms of the number of viewers, duration of views, distance between the viewer and the proposed project, and viewer expectation. Viewer groups include motorists along Interstate 15, Nipton Road, and Highway 95; recreational users in the area including OHV enthusiasts, kite surfers, users of the Primm Valley Golf Course, and hunters; residents of the Desert Oasis Apartment Complex in Primm, Nevada; visitors to the Town of Primm; residents of the communities of Nipton and Mountain Pass, California; and dispersed recreationists in Wilderness Areas. Viewer expectation considers viewer activity, adjacent land uses, special management areas in the vicinity, and any federal, state, or local regulations that protect visual resources in the area (BLM Manual H-8410-1). Figure 3.4-6, in Section 3.4, “Biological Resources”, shows the specially designated areas that are considered in this section’s visual resources analysis. Public concern expressed about the visual impact of the proposed project is also taken into account to describe the sensitivity of viewers.

Distance zones used to discuss views are consistent with BLM standard definitions. These are foreground (0 to 1 mile), middleground (1 to 3 miles), background (3 to 5 miles), and seldom-seen views (greater than 5 miles) (BLM Manual H-8410-1). Generally, increased visual contrast within foreground distances would be more noticeable to viewers than increased visual contrast within background distances.

Based on the potential viewer groups and sensitivity of those groups, distance zones, landscape features, and consultation with the CPUC and the BLM, KOPs were selected. These KOPs represent both sensitive and typical views in the proposed project area and form the bases of the visual analysis. The locations of the KOPs are shown on Figure 3.2-1. Contrast rating forms were completed for each of the KOPs following site visits in August of 2008; the contrast rating forms are included in Appendix C. The following KOPs were used for this analysis:

- KOP 1: View of the Transmission Corridor Looking Northeast toward the McCullough Mountain Range
- KOP 2: View from the South McCullough Wilderness Area
- KOP 3: View from Interstate 15 near Jean, Nevada
- KOP 4: View from the Desert Oasis Apartments in Primm, Nevada
- KOP 5: View from Ivanpah Dry Lake, East of Interstate 15
- KOP 6: View from Interstate 15 near Primm, Nevada
- KOP 7: View from Highway 95 in the Eldorado Valley
- KOP 8: View from Highway 164 Overpass in the Ivanpah Valley

The EITP would be located in the Basin and Range province, which includes the southwestern United States and northwestern Mexico.[1] This geographic region is characterized by generally north-trending high mountain ranges and intervening dry, alluvium-filled, flat-floored valleys (NASA 1986). The proposed project extends from the Ivanpah Valley in San Bernardino, California, to the Eldorado Valley in Clark County, Nevada (Figure 3.2-1). The physical setting of the proposed project and viewer groups would vary for each proposed project component and at various locations along the transmission and telecommunication routes as described below.

3.2.1.1 Transmission Line

The proposed transmission line would replace a segment of the existing single-circuit 115-kV Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass transmission line. The transmission line would run northeast from the proposed Ivanpah Substation and would proceed across Ivanpah Valley, across Ivanpah Dry Lake, through the town of Primm, Nevada, southeast of Roach Dry Lake, north of the Lucy Gray Mountains, and across the McCullough Mountains to the existing Eldorado Substation. Ivanpah Dry Lake and Roach Dry Lake are flat, unvegetated, and light in color compared to the surrounding terrain. The T~~t~~own of Primm consists of numerous casinos, commercial establishments, and some housing units. The Lucy Gray, Clark, and McCullough mountain ranges are jagged, visually prominent geologic formations that form the backdrop of views from the valley floor.

Figure 3.2-2 depicts the T~~t~~own of Primm, the Ivanpah Valley, the Lucy Gray Mountains, and the existing transmission line route. This view is typical of views surrounding the T~~t~~own of Primm. The view is characterized by primarily flat terrain with diagonally inclined low hills at the edge of the view and a rough, jagged mountain range in the background. The vegetation consists primarily of medium to tall native brush with low-lying ground cover. Dark brown distribution poles and gray lattice steel towers (LSTs) are present in this view, as is the T~~t~~own of Primm.

Motorists driving on Interstate 15 (I-15) in California and Nevada have views of the proposed project area. The proposed project area is also visible to recreational users of the dry lakes in the region. The Primm Valley Golf Club is located approximately 0.5 miles southeast of the proposed transmission line route. The existing recreational setting and potential impacts to recreational users are discussed in detail in Chapter 3.12, “Recreation.”

Urban uses adjacent to the transmission line include casinos in Primm, Nevada; the Desert Oasis Apartment Complex in Primm, Nevada; and the Bighorn Electric Generating System east of I-15. Additionally, the transmission line would be visible from the railroad tracks that parallel I-15.

3.2.1.2 Ivanpah and Eldorado Substations

The proposed Ivanpah Substation would be located in the Ivanpah Valley, a primarily flat area with a vegetative cover of even, low-lying shrubs broken by unvegetated dry lakes. Figure 3.2-3 shows the proposed Ivanpah Substation location as seen from the Primm Valley Golf Club. The terrain in this 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 a random distribution of medium to -tall bushes. In the middleground of the view, H-frame transmission towers and LSTs are visible; no structures are visible in the foreground or background.

[1] The Basin and Range province is a physiographic province or “surface unit,” a naturally defined region with homogeneous landforms and landscapes.

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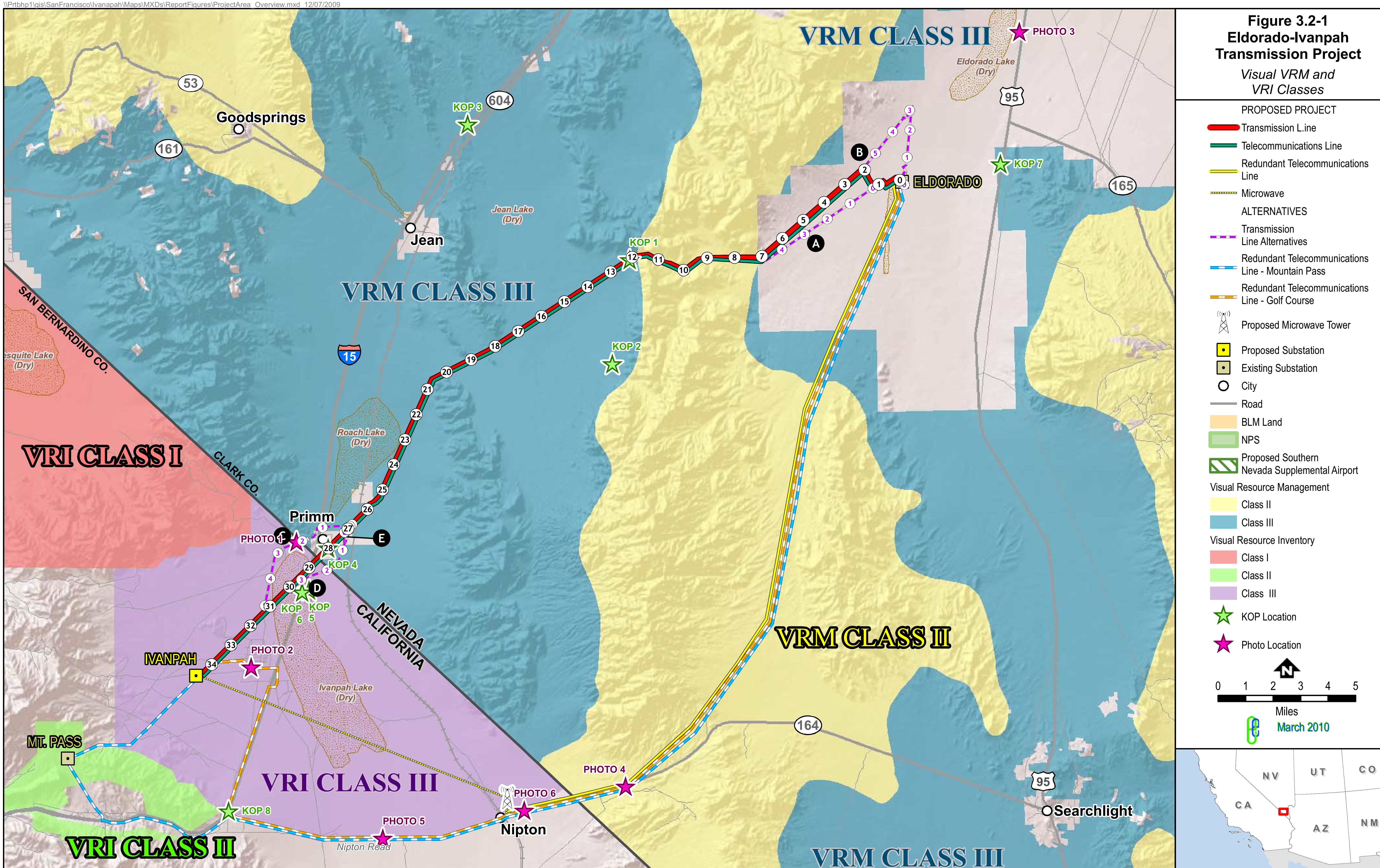

Figure 3.2-1
Eldorado-Ivanpah Transmission Project
Visual VRM and VRI Classes

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Character Photo 1 - View from a dirt road west of the city of Primm looking southeast toward the existing and proposed transmission line

Figure 3.2-2
Character Photo 1

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Character Photo 2 - View from the Primm Valley Golf Club looking west toward the site of the proposed Ivanpah Substation

Figure 3.2-3
Character Photo 2

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The Eldorado Substation is located in the Eldorado Valley, east of the McCullough Mountain Range. The Eldorado Substation is approximately 1.5 miles east of the existing Solar One facility. Figure 3.2-4 shows the existing Eldorado Substation from the Eldorado Dry Lake west of Highway 95. The view 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. The existing Eldorado Substation and nearby solar generation facility appear indistinct from this location.

Motorists driving on I-15 in California have views of the proposed project area near the proposed location of the Ivanpah Substation. The proposed substation would be located approximately 2 miles east of the Primm Valley Golf Club. The T~~t~~own of Primm, Nevada, is approximately 6 miles northeast of the proposed substation site. The nearest topographical feature to the proposed Ivanpah Substation is a metamorphic outcrop west of I-15.

The existing Eldorado Substation is approximately 3.5 miles west of Highway 95 and approximately 10 miles southwest of Boulder City, Nevada.

3.2.1.3 Telecommunications Route

The proposed telecommunications line would run southwest on the existing 500-kV Eldorado–Lugo Transmission Line from the Eldorado Substation between the McCullough and Highland mountain ranges to Nipton Road, near the California-Nevada border. The terrain in this location is rough and rolling with varying changes in elevation. The vegetation visible in this view consists primarily of low-lying native shrubs and randomly spaced Joshua trees. The existing 500-kV transmission line is strung on gray angular LSTs and H-frame LSTs (Figure 3.2-5). The 500-kV transmission line is strung on the larger of the two structures visible in this photograph; at this location, the line is strung on LSTs.

The telecommunications line would then proceed underground along the northern edge of Nipton Road (Figure 3.2-6); Nipton Road forms the northern boundary of the Mojave National Preserve (MNP). A distribution line strung on wooden poles currently runs along the southern edge of Nipton Road. The town of Nipton, California is visible in the background of Figure 3.2-6.

Near the town of Nipton on the northern boundary of the MNP, a microwave tower would be constructed. Figure 3.2-7 shows the proposed microwave tower location; the town of Nipton is visible in the foreground-middleground distance zone in this photograph. The microwave tower would transmit and receive communication from a second microwave tower that would be installed within the proposed Ivanpah Substation. The terrain in this view is gently sloping away from the viewer with the predominantly flat dry lake and the New York Mountain Range visible in the background. The vegetation visible in this view consists of low-lying native shrubs with manicured vegetation visible in the middleground near the town of Nipton, California. The texture of the foreground view is rough with randomly spaced vegetation; the texture of background views includes the flat, smooth dry lake and the jagged mountain range.

The existing 500-kV Eldorado–Lugo transmission line is visible to dispersed recreational users in the South McCullough Wilderness Area, within Eldorado Valley, and from the Wee Thump Joshua Tree Wilderness Area. Motorists along Nipton Road/Highway 164 also have views of a segment of the Eldorado-Lugo transmission line near the California/Nevada border. Motorists along Nipton Road, recreational users of the MNP, and residents in the town of Nipton, have views of the proposed project area where the telecommunications route would be undergrounded and where the microwave tower would be located.

3.2.1.4 Transmission Line Minor Route Variations

There are five minor route variations to the proposed transmission line route (Figure 3.2-1). Alternative A would bypass a segment of the proposed project route between Milepost (MP) 1 and MP 7 near the Eldorado Substation. Alternative B would bypass a segment of the proposed route that runs north and south near MP 2, in Boulder City, Nevada. Alternative C would bypass the T~~t~~own of Primm, Nevada, and the Ivanpah Dry Lake by rerouting the transmission line north of the Town of Primm. Alternative D and E would reduce impacts to the Ivanpah Dry Lake by rerouting the line south of the Town of Primm, matching the footprint of an existing transmission line.

Figure 3.2-4 shows the existing visual setting where Alternatives A and B would be located, as described above in Section 3.2.1.2, “Ivanpah and Eldorado Substations.” Viewer groups for Alternatives A and B include motorists along Highway 95, dispersed recreationists in the South McCullough Wilderness Area, and residents of Boulder City.

Figure 3.2-2 shows the existing visual setting where Alternatives C, D, and E would be located, as described above in Section 3.2.1.1, “Transmission Line.” Viewer groups for Alternatives C, D, and E include motorists along I-15, recreational users of the Ivanpah Dry Lake, visitors and workers at the casinos in the Town of Primm, residents of the Desert Oasis Apartment Complex located in the Town of Primm, and workers at the Bighorn Electric Generating System.

3.2.1.5 Telecommunications Route Alternatives

There are two alternatives to the proposed telecommunications system (Figure 3.2-1). Neither alternative would include the microwave tower component of the proposed telecommunications system; rather, both alternatives would continue underground past Nipton, California, along the northern edge of Nipton Road for approximately 10 miles. The Golf Course Alternative would then proceed northwest on existing 33-kV distribution poles, with a short segment installed in underground ducts under the Primm Valley Golf Course. The Mountain Pass Alternative would continue underground for an additional mile and would then proceed west and northeast on existing 33-kV distribution lines through the town of Mountain Pass and near the existing Mountain Pass Substation. Both telecommunication alternatives would ultimately connect with the proposed Ivanpah Substation.

Figure 3.2-3 shows the existing visual setting where the Golf Course Alternative and the Mountain Pass Alternative would be located, as described above in Section 3.2.1.2. Viewer groups for the telecommunication alternatives include motorists along Nipton Road, motorists along I-15, workers and golfers at the Primm Valley Golf Club, residents of the town of Mountain Pass, and recreational users of the Ivanpah Dry Lake.

3.2.1.6 Key Observation Points

Select KOPs represent typical views of proposed project components and views from sensitive locations. Sensitive locations include areas with protected visual resources or scenic vistas or areas with a high degree of visual sensitivity such as residences or recreational areas. The sensitivity of a location takes into account the type of users, the number of users or frequency of use, public concern for maintaining visual resources, any scenic designations or management plans designed to protect visual resources, and adjacent land uses (BLM Manual H-8410-1). The process for selecting these KOPs is described in more detail in Section 3.2.3.3, “Methodology.” These viewpoints are used to help establish the baseline for existing visual resources, and are later used to assess the proposed project’s potential to change the visible landscape based on prepared simulations as described in Section 3.2.3.3, “Methodology.” KOPs are characterized by describing the form, line, color, and texture of landforms, waterbodies, vegetation, and structures visible in the viewshed. The location of each KOP with respect to the proposed project area is shown in Figure 3.2-1.

Character Photo 3 - View from the Dry Lake west of Highway 95, looking southwest toward the Eldorado Substation

Figure 3.2-4

Character Photo 3

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Character Photo 4 - View from Highway 164 looking northeast
toward a portion of the proposed telecommunication system

Figure 3.2-5
Character Photo 4

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Character Photo 5 - View from Highway 164 looking east toward Nipton, California, adjacent to a portion of the proposed telecommunication system

Figure 3.2-6
Character Photo 5

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Character Photo 6 - View of the proposed microwave tower location

Figure 3.2-7
Character Photo 6

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KOP 1: View of the Transmission Corridor

KOP 1 (Figure 3.2-8) is a view of the existing Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line from within the transmission corridor. This view is oriented northeast into the McCullough Mountain Range and is representative of what would be seen from the McCullough Mountain Range. Typical recreational activities in this area include OHV use and hiking. This KOP depicts foreground and middleground views of the existing 115-kV transmission line.

KOP 1 shows the jagged and rocky terrain of the McCullough Mountain Range. The varying topography of the foreground creates an uneven horizon line that transitions from a nearly horizontal to a vertically inclining line, and then undulates to the eroded base of the mountains visible in the foreground and middleground; the background distance zone is not visible in this view due to topography. Light golden and tan soil, including randomly spaced tan, light brown, and black rock, is visible, giving the foreground a rocky and granular texture. Predominant colors of light golden to golden tan and slate gray with visible striations of warm pink and 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 discontinuous, rough appearance. No water is visible in this view.

The vegetation within 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 in color, with shrubs having a visually pointed texture and grasses a visually softer 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 existing Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV 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 115-kV transmission line visible in this view consists of gray H-frame LSTs and associated conductors. Other overlapping medium gray LSTs and rust brown tubular steel poles (TSPs) are also present in the view.

KOP 2: View from the South McCullough Wilderness

KOP 2 (Figure 3.2-9) is a view from west of the South McCullough Wilderness looking northwest towards the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line route, the I-15, and the Spring Mountain Range. This view is representative of what would be seen from a location near the South McCullough Wilderness. Typical recreational activities in this area include OHV use and hiking, although there are no nearby trailheads or named trails in this area. This KOP depicts middleground views of the existing 115-kV transmission line.

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 jagged and domed mountains in background views. The smooth, horizontal line of the valley transitions to a 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, giving the valley floor a visually smooth and indistinctive texture, contrasting with the surrounding mountains and hills. No water is visible in this view.

Visually bristly, pointy shrubs and ground cover interspersed with soft mounded grasses comprise 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 115-kV transmission line is present in this view, although not distinguishable at this distance, as well as other transmission lines not part of the proposed project. The portion of the Eldorado-–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line present 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 detract from the openness of the view.

KOP 3: View from Interstate 15 near Jean, Nevada

KOP 3 (Figure 3.2-10) is a view from I-15 looking southeast toward the Union Pacific Railroad (UPRR), the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV 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 generally be traveling. This KOP depicts seldom seen views of the existing 115-kV transmission line.

KOP 3 shows the expansive view afforded by 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 toward 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 light tan of the dry lake bed, appearing smooth. The smooth valley floor transitions into the visually varied mountain slopes, 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-green 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 visually bristly, pointed texture.

Although not distinguishable at this distance, the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line is present in the background of this view, as are as other transmission lines not part of the proposed project. The portion of the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line present 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 detract from the openness of the view.

KOP 4: View from Desert Oasis Apartments in Primm, Nevada

KOP 4 (Figure 3.2-11) is a view from the Desert Oasis Apartment Complex in the Town of Primm. The photograph was taken looking southwest toward the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line route and the Clark Mountain Range. Views from this location would occur frequently for residents leaving from or returning to their homes. Residents of the Desert Oasis Apartment Complex include employees of the Primm Valley casinos and seasonal residents working on construction projects in the vicinity of Primm, Nevada. This KOP depicts foreground views of the existing 115-kV transmission line.


a) View of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line looking northeast toward the McCullough Mountain Range


b) Simulated view of the proposed Eldorado-Ivanpah 230-kV transmission line in the McCullough Mountain Range

Figure 3.2-8 **KOP 1 – View of the Transmission Corridor**

a) View from west of of the South McCullough Wilderness looking northwest toward the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line

b) Simulated view of the proposed Eldorado-Ivanpah 230-kV transmission line from near the South McCullough Wilderness Area

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Figure 3.2-9 **KOP 2 – View from the South McCullough Wilderness Area**

a) View of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line looking southeast from I-15 near Jean, Nevada

b) Simulated view of the proposed Eldorado-Ivanpah 230-kV transmission line looking southeast from I-15 near Jean, Nevada

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Figure 3.2-10 **KOP 3 – View from Interstate 15 Near Jean, Nevada**

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a) View of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line looking southwest from the Desert Oasis Apartment complex in Primm, Nevada

b) Simulated view of the proposed Eldorado-Ivanpah 230-kV transmission line looking southwest from the Desert Oasis Apartment complex in Primm, Nevada

Figure 3.2-11 **KOP 4 – View from Desert Oasis Apartments in Primm, Nevada**

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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 of the landscaping 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 manicured landscape and only visible in the foreground. There is no native vegetation visible at middleground and background distances due to fencing around the apartment complex. Pointed trees and low bristly shrubs with interspersed palm trees comprise 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, as well as brown trunks.

The Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV 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 115-kV 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 5: View from Ivanpah Dry Lake, East of Interstate 15

KOP 5 (Figure 3.2-12) is a view from the Ivanpah Lake east of I-15 looking northwest toward the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line route, I-15, the Spring Mountain Range, and the T~~t~~own of Primm. This view provides a representative image of what a recreational user of the Ivanpah Dry Lake would see. The duration of views for recreational users would be medium to long, depending on the nature of the recreational activity. A recreational user who remains on the dry lake for an entire day or for an extended block of time would have long views of the proposed project. A recreational user who is crossing the dry lake would have a medium length view of the proposed project. Typical recreational activities in this area include racing, archery, kite buggying, and land sailing. This KOP depicts foreground views of the existing 115-kV transmission line.

KOP 5 shows the nearly flat Ivanpah Lake with the T~~t~~own 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 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, dark green shrub is located in the foreground. Vegetation is visible in background views at the base of the Spring Mountain Range. The vegetation in the middleground views is dark green with undefined edges and texture.

The Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line is present in this view, as well as other transmission lines not part of the proposed project, including the much more prominent existing transmission line on LSTs in the foreground of the view. The portion of the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line present, although not visible at this distance, consists of gray LSTs and associated conductors. The slightly elevated I-15, short cylindrical poles, and buildings and signs associated with the T~~t~~own of Primm are also visible in this view; no structures are visible in the background.

KOP 6: View from Interstate 15 near Primm, Nevada

KOP 6 (Figure 3.2-13) is a view from northbound I-15 looking northeast toward the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line route, the T~~t~~own of Primm, the Spring Mountain Range, and the Lucy Gray Mountains. Views of the proposed project for motorists on I-15 would be of a relatively short duration. The posted speed limit on I-15 is 70 miles per hour. For more information about I-15, refer to Section 3.14, "Transportation and Traffic." This KOP depicts middleground views of the existing 115-kV transmission line.

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 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 brown and slate to wine-purple mountains with visual 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 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 115-kV 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 115-kV 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 that 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 T~~t~~own of Primm and a slightly elevated overpass are also visible in this view.

KOP 7: View from Highway 95 in the Eldorado Valley

KOP 7 (Figure 3.2-14) is a view from southbound Highway 95 looking southwest toward the Eldorado Valley, the Eldorado Substation, the Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV transmission line route, and the McCullough Mountain Range. Views of the proposed project for motorists on Highway 95 would be of a relatively short duration. The posted speed limit on Highway 95 is 65 miles per hour. For more information about Highway 95, refer to Section 3.14, "Transportation and Traffic." This KOP depicts the background to seldom seen views of the existing Eldorado Substation and 115-kV transmission line.

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.

a) View of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line looking northeast from Ivanpah Dry Lake

b) Simulated view of the proposed Eldorado-Ivanpah 230-kV transmission line looking northeast from Ivanpah Dry Lake

Figure 3.2-12 **KOP 5 – View from Ivanpah Dry Lake, East of Interstate 15**

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a) View of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line looking northeast toward Primm, Nevada

b) Simulated view of the proposed Eldorado-Ivanpah 230-kV transmission line looking northeast toward Primm, Nevada

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Figure 3.2-13 **KOP 6 – View from Interstate 15 near Primm, Nevada**

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a) View of the existing Eldorado Substation and Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line looking west from Highway 95

b) Simulated view of the upgraded Eldorado Substation and the proposed Eldorado-Ivanpah 230-kV transmission line looking west from Highway 95

Figure 3.2-14 **KOP 7 – View from Highway 95 in the Eldorado Valley**

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Vegetation in this view consists of low, rounded, scraggly, sharp shrubs, which create a generally horizontal 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 115-kV 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 115-kV transmission line present, while not visible at this distance, 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 8: View from the Highway 164 Overpass in the Ivanpah Valley

KOP 8 (Figure 3.2-15) is a view from the I-15/Highway 164 Overpass looking northwest toward the proposed Ivanpah Substation, Eldorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115-kV 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, broader view of what a motorist on northbound I-15 would see. Views of the proposed project for motorists on I-15 would be of a relatively short duration. The posted speed limit on I-15 is 70 miles per hour. For more information about I-15, refer to Section 3.14, “Transportation and Traffic.” This KOP depicts the background to seldom seen views of the proposed Ivanpah Substation location and the existing 115-kV transmission line.

KOP 8 is a view of the Ivanpah Valley with the Clark Mountain 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 I-15. Ivanpah Lake and the valley floor create a generally horizontal line with topographic variations at the isolated, low, conical hills and at the irregularly weathered mountains in the background. The exposed soil in the valley is predominantly golden tan, while Ivanpah Lake is a light tan. The hills and mountains range in color, from light tan to dark golden brown to mottled brown; the Lucy Gray Mountains have a warm pink cast. The gravelly texture of the foreground transitions into the generally smooth valley floor, which transitions into 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 115-kV transmission line, although not distinguishable at this distance, 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 115-kV transmission line present consists of gray LSTs and associated conductors. 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 T~~t~~own of Primm. The grays, black, whites and yellows of I-15 create 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 T~~t~~own of Primm appear angular and block-like in the background.

3.2.2 Applicable Laws, Regulations, and Standards

The following section provides a summary of federal, state, and local laws, regulations, and standards that govern visual resources in the proposed project area.

3.2.2.1 Federal

Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) of 1976 (90 Stat. 2743; 43 United States Code 1601, et seq.) established the BLM as the jurisdictional agency for expanses of land in the West to be managed as multiuse lands. The following sections of the FLPMA relate to the management of aesthetic and visual resources on federal lands:

> § 102(a): "The public lands [shall] be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."
>
> § 201(a): "The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including…scenic values)."
>
> § 505(a): "Each right-of-way shall contain terms and conditions which will…(ii) minimize damage to the scenic and esthetic values."

Federal regulations regarding aesthetics and visual resources are enacted through the application of the Visual Resource Management (VRM) system outlined in the BLM 8400 VRM Manual. The VRM system involves inventorying scenic values and establishing management classes and objectives for those values, and then evaluating proposed activities to determine whether they conform to the management objectives. VRM classes may be established in Resource Management Plans (RMPs). In the absence of VRM classes in an adopted RMP, BLM resource specialists may complete a Visual Resource Inventory (VRI) for the affected area. The California Desert Conservation Area Plan does not have established VRM classes for the proposed project area within California. The Las Vegas RMP has established VRM classes for the proposed project area within Nevada. Because the classes are established differently for Nevada and California, there may be different ratings for adjacent lands at the California–Nevada border. The VRM and VRI classes described below are shown on Figure 3.2-1.

California Desert Conservation Area Plan

The proposed Ivanpah Substation, a portion of the transmission route, and a portion of the telecommunications route would be located on BLM land managed according to the California Desert Conservation Area (CDCA) Plan (BLM 1980). The CDCA Plan does not include VRM classifications, nor does it directly address scenic values in the jurisdictional area; however, the BLM developed VRI classes for the ISEGS project, which are consistent with the CDCA Plan. The proposed project would be located entirely within a VRI Class III area (BLM and CEC 2009). The management objectives associated with VRI classes are discussed below in Section 3.2.3.3, "Methodology."

Northern and Eastern Mojave Plan Amendment

The Northern and Eastern Mojave (NEMO) Plan Amendment (BLM 2002) updated the CDCA Plan for lands crossed by the proposed project. The plan did not establish VRM classes. The NEMO plan addressed visual resource impacts to users of historic trails in the plan area. The Old Spanish Historic Trail crosses land managed according to the NEMO Plan Amendment, but the trail would not be crossed by the proposed transmission or telecommunications routes, including alternatives, and no proposed project components would be located within the vicinity of the Old Spanish Historic Trail.

a) View of the proposed Ivanpah Substation location looking northwest from the Highway 164/Interstate 15 overpass

Simulated iew of the proposed Ivanpah Substation location looking northwest from the Highway 164/Interstate 15 overpass
looking west from Highway 95

Figure 3.2-15 **KOP 8 – View from the Highway 164 Overpass in the Ivanpah Valley**

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Las Vegas Resource Management Plan

Within Nevada, a portion of the proposed project would be located on land managed according to the Las Vegas RMP (BLM 1998). The BLM Southern Nevada District Office manages land under its jurisdiction according to the goals and policies outlined in the Las Vegas RMP, which contains the following objective regarding the management of visual resources:

- **VS-1.** Limit future impacts on the visual and aesthetic character of the public lands.

The proposed transmission line would cross VRM Class II and VRM Class III land as designated by the Las Vegas RMP. The proposed telecommunications line would cross VRM Class II land. The management objectives associated with VRM classes are discussed below in Section 3.2.3.3, “Methodology.”

National Historic Preservation Act

The National Historic Preservation Act (NHPA) includes language protecting the visual integrity of sites listed or eligible for the National Register of Historic Places: “Examples of adverse effects…include…introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features…” (36 Code of Federal Regulations Part 800.5). Impacts to visual resources protected by the NHPA are discussed in Section 3.5, “Cultural Resources.”

3.2.2.2 State

California Department of Transportation

The California State Department of Transportation (Caltrans) administers the State Scenic Highway Program to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways (California Streets and Highways Code § 260, et seq.). The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in the Streets and Highways Code § 263. The program entails regulation of land use and density of development, attention to the design of sites and structures, attention to and control of signage, landscaping, and grading, and other restrictions. The local jurisdiction is responsible for adopting and implementing such regulations. If a highway is listed as eligible for official designation, it is also part of the Scenic Highway System and care must be taken to preserve its eligibility status. There are no designated or eligible State Scenic Highways within the vicinity of EITP.

Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) developed the I-15 Landscape and Aesthetics Corridor Plan (NDOT 2005) as required by the NDOT Master Plan. The I-15 Landscape and Aesthetics Corridor Plan does not contain any rules, regulations, or policies regarding projects built within view of the I-15 corridor. However, in outlining planned landscape and aesthetic improvement projects for the corridor, the I-15 Landscape and Aesthetics Corridor Plan does establish scenic zones along the highway. The proposed project would parallel the portion of I-15 classified as the “Gateway to Nevada’s Excitement” Design Segment. Design Objectives for the portion of I-15 paralleled by the proposed project are classified as Statewide Gateway (near Primm, Nevada) and Preserved Desert Landscape Character (from Roach, Nevada, to Jean, Nevada). Design objectives for these segments of I-15 applicable to the proposed project include the following:

- Preserved Desert Landscape Character
  - 2. Preserve scenic views of mountain ranges in the distance, middleground of the Mojave Desert, and lake beds in the foreground.

- Managed Desert Landscape Character
  - 1. Plan for a future design context that will integrate expected growth, major facilities, and development within this segment.
  - 2. Maintain the desert character in conjunction with new urbanization and growth.

There are no designated or eligible Scenic Highways within view of the proposed project in Nevada (NDOT 2009).

3.2.2.3 Regional and Local

San Bernardino County, California

The Conservation and Open Space Elements of the San Bernardino County General Plan include the following goals, objectives, and programs relating to aesthetic and visual resources (San Bernardino County 2005 and 2006):

- **Goal D/CO 1.** Preserve the unique environmental features and natural resources of the Desert Region, including native wildlife, vegetation, water, and scenic vistas.
- **Policy D/CO 1.2.** Require future land development practices to be compatible with the existing topography and scenic vistas and protect the natural environment.
- **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 certification standards.
- **Goal OS5.** The County will maintain and enhance the visual character of scenic routes in the County.
- **Policy OS 5.1.** Features meeting the following criteria will be considered for designation as scenic resources: a.) A roadway, vista point, or area that provides a vista of undisturbed natural areas, b.) Includes a unique or unusual feature that comprises an important or dominant portion of the viewshed (the area within the field of view of the observer), c.) Offers a distant vista that provides relief from less attractive views of nearby features (such as views of mountain backdrops from urban areas).
- **Policy OS 5.2.** Define the scenic corridor on either side of the designated route, measured from the outside edge of the ROW, trail, or path. Development along scenic corridors will be required to demonstrate through visual analysis that proposed improvements are compatible with the scenic qualities present.
- **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 route as a scenic highway and applies all applicable policies to development on this route.
  - I-15 from the junction with Interstate 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 East Yermo Road overcrossing on the north side and all incorporated areas.
- **Night Sky Protection Ordinance (Ord. 3900).** This ordinance provides that “Commercial and industrial outdoor lighting must be fully shielded so that no light is emitted above the horizontal plane…do not direct light or light trespass onto adjacent property…or to any member of the public who may be traveling on adjacent roadways.”

Clark County, Nevada

The Clark County Comprehensive Plan includes the following policies related to the siting and design of public utilities to minimize impacts to aesthetic and visual resources (Clark County 2006):

- **UT 1-4.** Support increasing capacity of existing utility corridors over establishing new ones.
- **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
  - Using architecture design on major utility poles to complement the character of a community
  - Placing high capacity electrical transmission lines underground to lessen visual impacts in large multi-use projects

Boulder City, Nevada

The Boulder City Master Plan includes the following policy related to visual impacts within the Eldorado Valley region (Boulder City 2003):

> **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.

3.2.3 Impact Analysis

This section defines the methodology used to evaluate impacts for visual resources, including CEQA impact criteria. The definitions are followed by an analysis of each alternative, including a joint CEQA/NEPA analysis of impacts. At the conclusion of the discussion is a NEPA impact summary statement and CEQA impact determinations. This section also lists the Applicant Proposed Measures (APMs) designed to minimize impacts to visual resources in Section 3.2.3.4, "Applicant Proposed Measures." For mitigation measures, refer to Section 3.2.4.

3.2.3.1 NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects to visual resources would result from the proposed project, and explains the significance of those effects in the proposed project area (40 CFR 1502.16). Significance is defined by Council on Environmental Quality regulations and requires consideration of the context and intensity of the change that would be introduced by the project (40 CFR 1508.27). Impacts are discussed in proportion to their significance (40 CFR 1502.2[b]). To facilitate the comparison of alternatives, the significance of environmental changes is described in terms of temporal scale, spatial extent, and intensity.

The following criteria were considered in determining whether a visual impact would be adverse. The BLM VRM methodology was used as the primary indication of potential impact significance. If impacts meet the VRM class objectives of a given KOP in Nevada or are consistent with the VRI objectives in California, the impact is considered minor or negligible. If the impact does not meet the applicable VRM or VRI class objectives of a given KOP, the impact is considered major. The analysis considers the level of visual contrast that would be introduced at KOPs, focusing on contrast in form, line, color, and texture and the introduction of new sources of light or glare.

3.2.3.2 CEQA Impact Criteria

Under CEQA, the proposed project would have a significant impact if it would:

a. have a substantial adverse effect on a scenic vista;

b. substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c. substantially degrade the existing visual character or quality of the site and its surroundings; or

d. create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

3.2.3.3 Methodology

The proposed project would be located primarily on BLM land; therefore, the methodology used to determine impacts on visual resources is consistent with the BLM's guidelines for selecting KOPs, describing the views from these locations, determining the degree to which views would be impacted, and assessing the proposed project's compliance with applicable VRM or VRI objectives. The assessment of the proposed project's impacts is based on an evaluation of the changes to the existing visual environment that would result from construction, operation, and, maintenance of the proposed project.

KOPs were selected in accordance with BLM VRM Manual 8431 and include critical viewpoints such as those from residential communities or road crossings, representative views of typical landscapes in the proposed project area, and any special project or landscape feature, such as the proposed substation location or a dry lake bed. The KOP selection process considered the number of viewers, the duration of the view, and viewer expectation.

Viewer expectation and the sensitivity of viewpoints were also considered in selecting the KOPs as outlined in the BLM Visual Resources Inventory Manual 8410-1. Factors considered in determining the sensitivity of a viewpoint and viewer expectation include the types of users in the area, the amount of use for each location, any public interest, adjacent land uses, and areas with special designations such as Wilderness Areas or Recreation Areas.

KOPs were agreed upon by the applicant's consultants, CPUC consultant, and BLM staff from both the Needles and Las Vegas field offices. The consulting team met with BLM staff from both field offices to conduct field work and identify potential KOPs. Coordination with agency staff continued after completion of the visual field work to discuss potential project issues and finalize the selection of KOPs for the proposed project.

Field surveys in San Bernardino County, California, and Clark County, Nevada, were conducted on October 16, 2008, to select potential KOPs in consultation with the BLM. Additional field surveys were conducted in Clark County, Nevada, on November 13 and 14, 2008, to select potential KOPs in consultation with the BLM. During the field visits and in subsequent consultation, BLM staff indicated that:

- BLM land in California that would be crossed by proposed project components is managed as VRI Class III; and
- BLM land in Nevada that would be crossed by proposed project components is designate VRM Class III and VRM Class II.

KOP photos were taken with a 35mm camera and fixed 50mm lens, with a resulting horizontal field of view of approximately 40 degrees. A single-frame image was used for each KOP. If viewed as a 10-inch wide image at a distance of about 1 foot, this field of view approximates the actual field of view experienced.

In accordance with BLM guidelines, simulations were prepared to assess the degree of visual contrast that would be introduced by the proposed project. The photographs taken from each of the KOPs were used as the basis for the simulations. 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 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 proposed project as it would appear after construction provided the basis for determining the potential impacts on views and visual quality. These simulations do not include any landscaping plans as landscaping had not been finalized at the time the simulations were prepared. Additionally, all simulations depict the proposed project as it would appear when constructed and do not depict the proposed project during construction. Therefore, these simulations depict the proposed project as it would appear immediately after construction and before any landscaping were to be installed.

The impact analysis assessed the contrast between the existing conditions and conditions that would exist after construction of the proposed project for basic visual features (landforms, water bodies, vegetation, and structures) using four basic design elements (form, line, color, and texture). Views and features of the proposed project are described in terms of distance zones. These are foreground (0 to 1 mile), middleground (1 to 3 miles), background (3 to 5 miles), and seldom-seen views (greater than 5 miles).
The degree of contrast that would be introduced by the proposed project at each KOP is then assigned a BLM rating which reflects the degree of contrast of visual changes against the objectives of the applicable VRM class or VRI rating that the KOP is located within. These ratings are as follows:

- Strong: the element contrast demands attention, will not be overlooked, and is dominant in the landscape
- Moderate: The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- Weak: the element contrast can be seen but does not attract attention.
- None: the element contrast is not visible or perceived.

BLM classifies the visual resources of an area by assigning them to one of four inventory classes using a standard visual resource inventory process. Each of the four classifications corresponds to management goals as follows:

- Objective Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- Objective Class II: The objective of this class 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.

- Objective Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- Objective Class IV: The objective of this class is to provide for management activities that allow major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

As directed in the BLM Visual Contrast Rating Manual 8431, a number of variables are considered in determining the significance of a potential impact to aesthetics and visual resources for each KOP. A weak visual change can constitute a major visual impact if the change is perceptible in foreground views to a highly sensitive viewer group such as recreational viewers in a VRM Class I area. The factors considered in determining the extent and implications of the visual changes are as follows:

- The specific changes in the affected environment's composition and character and any outstanding valued qualities,
- The context of the affected visual environment,
- The extent to which the affected environment contains places or features that have been designated in plans and policies for protection or special consideration, and
- The numbers of viewers, their activities, and the extent to which the activities are related to the visual qualities affected by proposed changes.

3.2.3.4 Applicant Proposed Measures

The applicant has included the following APMs related to visual resources:

APM 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, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.

APM 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 would blend back into the overall landscape context.

APM AES-3: Non-Reflective Finish. LSTs and TSPs would be constructed of steel that was galvanized and treated at the factory to create a dulled finish that would 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.

APM 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 them to an appearance that would blend back into the overall landscape context.

APM AES-5: Use Existing Access Roads. To the extent feasible, existing access roads would be used.

APM AES-6: Minimize Road Modifications. Widening and grading of roads would be kept to the minimum required for access by proposed project construction equipment.

APM 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.

APM 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 offsite light spill at times when the lighting might be in use.

3.2.3.5 Proposed Project / Proposed Action

Construction

Visual impacts associated with construction of the proposed project would result from the following:

- The removal of existing vegetation and the exposure of bare soils within construction workspaces;
- Grading and vegetation removal to improve access and spur roads;
- Exposure of bare soils where pits would be dug for tower installation;
- Removal of vegetation and grading for the proposed Ivanpah Substation and microwave tower;
- Trenching along Nipton Road where the telecommunications line would be installed underground; and
- Storage of materials and equipment.

Construction impacts would be greatest in areas with the greatest amount of land disturbance, such as laydown or staging areas and areas where substantial trenching would be required. Construction yards would be located at the Eldorado Substation, which is visible in KOP 7 (Figure 3.2-14); in Jean, Nevada; at an existing generating station yard in Nevada; at a Primm Valley Casino vacant lot in Primm, Nevada; at a vacant lot at the Whiskey Pete's Casino in Primm, Nevada; at the proposed BrightSource generating station yard, which would be visible in KOP 8 (Figure 3.2-15); and in the town of Nipton, California.

However, construction impacts would be temporary because the land would be restored to its original condition (APM AES-4). Construction would occur over an approximately 19 month period, although construction in any one location would be of a shorter duration. The visual impact from activities, such as grading and the removal of vegetation, may occur for up to three years after the construction period, depending upon the success of revegetation efforts. Additionally, MM BIO-2 requires the applicant to develop a Reclamation, Restoration, and Revegetation Plan (RRRP) prior to adoption of the Final EIR/EIS that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. MM BIO-2 is discussed in further detail in Section 3.4: 'Biological Resources.'

Construction impacts would be greatest for areas with high degrees of viewer sensitivity, such as residential areas, recreational areas, and areas with unique visual features. These include viewers at KOP 1, KOP 2, KOP 4, and KOP 5 (Figures 3.2-8, 3.2-9, 3.2-11, and 3.2-12). Construction in these areas would temporarily disrupt viewsheds, creating visual contrast by introducing construction equipment and as a result of construction-related activities.

Operation & Maintenance

This section summarizes the visual impacts that would occur during operation and maintenance of the proposed project.

The proposed double-circuit 230-kV transmission line would replace an existing single-circuit 115-kV subtransmission line. The proposed transmission line would be strung on 216 LSTs that range in height from 110 to 180 feet and 42 single-circuit H-Frame towers that range in height from 45 to 75 feet. The proposed LSTs are depicted in the simulation for KOP 4 (Figure 3.2-11), and the single circuit H-frame structures are depicted in the simulation for KOP 1 (Figure 3.2-8). The existing single-circuit 115-kV subtransmission line is strung on H-Frame towers that are approximately 70-feet tall. Replacing existing towers with larger, taller towers would incrementally contribute to visual impacts, but would not create a new source of contrast in an otherwise undeveloped landscape. However, given the increased structure size, there would be a minor, long-term adverse effect on visual resources. As discussed in Chapter 3.9, "Land Use," the transmission line route is primarily within established BLM energy corridors and would follow the existing 115-kV transmission ROW with the exception of six minor deviations.

Longer-term visual impacts would also result from removing or altering vegetation that may currently provide a visual barrier, or from changing landforms in a way that introduced contrasts in visual scale, special characteristics, form, line, color, or texture. The proposed Ivanpah Substation and microwave tower would affect visual resources by introducing a new, angular form into an undeveloped area, disrupting the lines and spatial proportions of views. The proposed Ivanpah Substation is depicted in the simulation for KOP 8 (Figure 3.2-15). The facility colors would contrast with natural palettes, and the structures would disrupt lines and uniform textures in the landscape. Permanent impacts on visual resources would be more intense for areas with higher degrees of viewer sensitivity, including residences, recreation areas such as the Ivanpah Dry Lake, Wilderness Areas, and the MNP.

The visual impact of the proposed project is discussed in more detail with regard to each KOP in the next section. Contrast ratings prepared for each KOP are included in Appendix C.

Impacts by Key Observation Point

Simulations of the proposed project facilities for each KOP, figures 3.2-8 through 3.2-15, are provided below. The simulations are compared against KOP photographs depicting the existing setting to assess the level of contrast that would be introduced by the proposed project. Contrast is described in terms of changes to the form, line, color, and texture or landforms, water bodies, vegetation, and structures present in the view. Contrast is also described in terms of duration. Short-term changes would be present during construction. Long-term changes would be present for the life of the proposed project. The analysis then considers whether the level of contrast meets the visual resource objectives of the applicable VRM Class or VRI rating.

Appendix C contains the visual contrast rating worksheets (Form 8400-4) from the BLM Visual Resource Inventory Handbook H-8410-1.

KOP 1: View of the Transmission Corridor

KOP 1 (Figure 3.2-8) 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. The sensitivity of this viewpoint is considered moderate: while visual resources are of high concern to recreational users of the South McCullough Wilderness Area, and the maintenance of those values is important, overall use of the area is low, and adjacent land uses include other transmission lines. The proposed project would be visible in the foreground and middleground distance zone. The contrast rating worksheet for this KOP is located in Appendix C.

Construction of the proposed transmission line would be visible in KOP 1. Construction would result in short-term and long-term changes to the foreground and middleground of the existing environment of this view. Large equipment, delivery trucks, and construction equipment would be present during construction, and the movement and storage of such vehicles would be visible. Transmission towers would become visible as they are erected throughout the construction period. Construction of new access roads, decommissioning of existing H-frame LST and T-frame LST transmission towers, installation of the telecommunications line, 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. To lessen the visual impacts associated with the clearing of vegetation and rock cutting required to improve existing access roads or construct new access roads, the applicant would consult with the BLM to determine feasible methods to weather exposed rock (APM AES-1) and would blend the roads back into the overall landscape by seeding and/or inter-planting (APM AES-2).

Operation of the proposed project would result in long-term changes to the foreground and middleground of the existing environment of KOP 1. This KOP depicts a location where the proposed route would diverge from the existing ROW due to a transmission line crossing. Long-term visible changes would result from the addition of H-frame TSP structures, LSTs, the telecommunications line, 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 line, and associated conductors would be visible in the foreground in this view; LSTs would be less distinguishable in the middleground in this view. Denser H-frame TSPs and larger LSTs would replace the existing H-frame and T-frame transmission line in this view, creating a strong change to the line of the structures in the foreground and a strong change to the line of the structures in the middleground. Areas permanently cleared of vegetation for access roads and transmission line towers would be visible in the foreground of KOP 1. As outlined in APM AES-1 and APM AES-2, cleared areas in the South McCullough Mountains would be reseeded and interplanted and disturbed rock would be stained to lessen visual contrast.

Development of the proposed transmission line in the view from KOP 1, including construction and operation, would result in a weak change to the form, line, color, and texture of the landform and vegetation. With the reseeding, interplanting, and rock staining outlined in APM AES-1 and APM AES-2, changes to the form, line, color and texture of landforms visible in this view would be weak for both foreground and middleground views. 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 moderate change to the form, ~~line,~~ color, and texture for structures present in the middleground of the existing environment. Changes to the line of structures in both foreground and middleground views would be strong.

Although the proposed transmission line would represent a strong contrast, it would not dominate the view of the casual observer given the existing hard lines of the transmission towers and lines currently located in this area. The changes to the existing environment would be consistent with the VRM Class III assigned to the foreground but would not be consistent with the VRM Class II designation in middleground views. Therefore, development of the proposed transmission line would result in a major, adverse, and unavoidable effect at KOP 1.

KOP 2: View from South McCullough Wilderness

KOP 2 (Figure 3.2-9) is located within and includes views of a BLM VRM Class III area, although the South McCullough Wilderness Area immediately east of the photo location is managed as VRM Class II. The sensitivity of this viewpoint is moderate: while visual resources are a high concern for recreational users of the South McCullough Wilderness Area and the maintenance of those values is important, the overall use of the area is low and adjacent land uses include other transmission lines. This viewpoint is approximately 3 miles from the proposed transmission line route, so the proposed project would be visible in background views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term and long term changes to the middleground of the existing environment. 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 were erected throughout the construction period. Construction of new access roads, decommissioning of existing transmission towers, installation of the telecommunications line, 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. To lessen the visual impacts associated with the clearing of vegetation and rock cutting required to improve existing access roads or construct new access roads, the applicant would consult with the BLM to determine feasible methods to weather exposed rock (APM AES-1) and would blend the roads back into the overall landscape by seeding and/or inter-planting (APM AES-2).

Operation of the proposed project would result in minor long-term changes to the middleground of the existing environment. Long-term changes would result from the addition of LSTs, the telecommunications line, and associated conductors. These elements of the proposed project would barely be visible to not visible under certain conditions, such as haze, dust storms, or at night due to the 3-mile distance between the viewpoint and the proposed transmission route. During normal conditions, these elements would result in weak changes to the existing environment due to the distance. 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.

Development of the proposed transmission line in this view, including construction and operation, would result in a minor change in the form, line, color, and texture of the land form, 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 because all changes to landform, vegetation, and structures visible from this vantage point would be weak. Therefore, development of the proposed transmission line would result in a minor adverse effect at KOP 2, and mitigation would not be required.

KOP 3: View from Interstate 15 near Jean, Nevada

KOP 3 (Figure 3.2-10) includes views of a BLM VRM Class III area. KOP 3 is located approximately 6.5 miles from the proposed transmission line route. The sensitivity of this viewpoint is moderate to low: there is a high level of use, but visual resources are a low concern for most users and a low priority for public concern. The sensitivity of this viewpoint is considered low because most viewers would be travelers on I-15. Travelers that typically use this roadway are primarily concerned with reaching a destination as opposed to driving specifically for recreation or sightseeing, and the posted speed limit is 70 miles per hour. Additionally, there is no scenic highway designation for this roadway. This viewpoint is located approximately 6.5 miles from the proposed transmission line route, so the proposed project would be visible in background views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term changes to the background of the existing environment similar to those described for KOP 2, but these changes would not be visible to motorists along I-15 due to the distance.

Operation of the proposed project would result in long-term changes to the background of the existing environment of KOP 3 similar to those described for KOP 2. Due to the approximately 6.5-mile distance between this viewpoint and the proposed transmission route, changes to structures in the background would not be visible in this view.

Development of the proposed transmission line in this view, including construction and operation, would not result in any visible change in the form, line, color, and texture of the land, water body, vegetation, or structures present in the existing environment due to the fact that changes would be present only in seldom seen views and the viewer would likely be traveling at a high speed. Additionally, the proposed project would follow the existing route and would repeat the pattern created by the existing 115-kV transmission line that is currently present in this view. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands because all changes to landform, vegetation, and structures would be not visible from this viewpoint. Therefore, development of the proposed transmission line would result in a negligible adverse effect at KOP 3, and mitigation would not be required.

KOP 4: View from the Desert Oasis Apartments in Primm, Nevada

KOP 4 (Figure 3.2-11) is not located on BLM-managed land but includes views of a BLM VRM Class III area in the foreground. Middleground and background views include land designated VRI Class III. The BLM does not assign VRM classes to or assess visual impacts for private land but has assigned VRM and VRI classes for land visible from this location. The sensitivity of this viewpoint is moderate to high: maintenance of visual resources is a major concern for residents and the use of the area is high, although adjacent land uses include existing energy and industrial development. This viewpoint is adjacent to the proposed transmission route, so the proposed project would be visible in foreground views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term changes to the foreground of the existing environment of KOP 4. Construction of new access roads, decommissioning of existing transmission towers, installation of the telecommunications line, 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 were erected throughout the construction period. However, the wall barrier surrounding the apartment complex would block views of much of the construction activity, equipment, and material storage.

Operation of the proposed project would result in long-term changes to the foreground of the existing environment of KOP 4. Long-term visible changes would result from the addition of LSTs, the telecommunications line, and associated conductors in the foreground. Taller LSTs would replace the existing H-frame towers in this view, resulting in a strong change to the line of the structures in the foreground. Additionally, the conductor wire would be thicker and would therefore strengthen horizontal lines visible in foreground views, resulting in a strong degree of visual contrast. Areas permanently cleared of vegetation for access roads and transmission line towers would not be visible in the foreground of KOP 4 due to the wall barrier surrounding the apartment complex.

Development of the proposed transmission line in this view, including construction and operation, would not result in any visible change in the form, line, color, or texture of the landform and vegetation. Construction and operation of the proposed transmission line in this view would result in a moderate change in the form, line, and color of structures present in the foreground of the existing environment. The changes to the existing environment would be consistent with the VRM Class III and VRI Class III designations assigned to the BLM-managed lands in the viewshed because changes to structures visible from this vantage point would be moderate. Therefore, development of the proposed transmission line would result in a minor, adverse affect and mitigation would not be required.

KOP 5: View from the Ivanpah Dry Lake

KOP 5 (Figure 3.2-12) is located within and includes foreground and middleground views of a VRI Class III area. Background views include land managed according the VRM Class III objectives. The sensitivity of this viewpoint is moderate to high: there is a high level of use and visual resources are a moderate concern for most recreational users although there is significant adjacent development, both commercial and industrial. Visual concern is considered moderate for most recreational users because the duration of views would be high and recreational activities may be enhanced by visual resources although that is not the primary objective of the activity. This viewpoint is located approximately 1 mile from the proposed transmission line route, so the proposed project would be visible in middleground views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term and long-term changes to the middleground of the existing environment. 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. Construction of new access roads, decommissioning of existing transmission towers, installation of the telecommunications line, 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 5 under certain conditions.

Operation of the proposed project would result in long-term changes to the middleground of the existing environment of KOP 5 similar to those described for KOP 2. The LSTs, telecommunications line, and associated conductors would generally blend in against the backdrop of the Spring Mountain Range and would barely be visible to not visible in middleground views from KOP 5. Access roads, another permanent element of the proposed project, and other areas permanently cleared of vegetation would likely not be visible from KOP 5.

Development of the proposed transmission line in this view, including construction and operation, would result in no visible change in the form, line, color, or texture of the landform and vegetation. Construction and operation 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 VRI Class III and VRM Class III designations assigned to these BLM-managed lands because all changes to landform, vegetation, and structures visible from this vantage point would be weak. Therefore, development of the proposed transmission line would result in a minor adverse effect, and mitigation would not be required.

KOP 6: View from Interstate 15 near Primm, Nevada

KOP 6 (Figure 3.2-13) is located within and includes foreground and middleground views of a VRI Class III area. Background views include land managed according the VRM Class III objectives. The sensitivity of this viewpoint is moderate to low: there is a high level of use, but visual resources are a low concern for most users and a low priority for public concern. The sensitivity of this viewpoint is considered low because most viewers would be travelers on I-15. Travelers that typically use this roadway are primarily concerned with reaching a destination as opposed to driving specifically for recreation or sightseeing, and the posted speed limit is 70 miles per hour. Additionally, there is no scenic highway designation for this roadway. The T~~t~~own of Primm, Nevada has a number of hotels and casinos, a gas station, and a truck stop Visitors to the Town of Primm and potential viewers of the proposed project include tourists and travelers along I-15 who have stopped for amenities. This viewpoint is approximately 1 mile from the proposed transmission line route, so the proposed project would be visible in middleground views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term changes to the middleground views similar to those described for KOP 5.

Operation of the proposed project would result in long-term minor changes to the middleground of the existing environment of KOP 6 similar to those described for KOP 2. The LSTs, telecommunications line, and associated conductors would introduce new vertical lines into the landscape; these elements of the proposed project would result in weak visual change. Access roads and other areas permanently cleared of vegetation would likely not be visible from KOP 6 because existing access roads in this viewshed are not discernable at middleground distances.

Development of the proposed transmission line in this view, including construction and operation, would result in no visible change in the form, line, color, or texture of the land, water body, or vegetation. Construction of the proposed project would be most visible as the transmission line crossed I-15 and could result in moderate visual impacts to motorists along I-15. Operation of the proposed transmission line in this view would result in a weak change in the form and line by introducing new vertical lines into the landscape for structures present in the existing environment. The changes to the existing environment would be consistent with the VRI Class III and VRM Class III designations assigned to these BLM-managed lands because all changes to landform, vegetation, and structures visible from this vantage point would be weak. Therefore, development of the proposed transmission line would result in a minor adverse effect, and mitigation would not be required.

KOP 7: View from Highway 95 in the Eldorado Valley

The photo in KOP 7 (Figure 3.2-14) was taken from BLM land managed as VRM Class III, but depicts views of private land in the Eldorado Valley south of Boulder City, Nevada. The BLM does not assign VRM classes to or assess visual impacts of private land. The sensitivity of this viewpoint is moderate to low: there is a high level of use, but visual resources are a low concern for most users and a low priority for public concern. The sensitivity of this viewpoint is considered low because most viewers would be travelers on Highway 95. Travelers that typically use this roadway are primarily concerned with reaching a destination as opposed to driving specifically for recreation or sightseeing, and the posted speed limit is 65 miles per hour. Additionally, there is no scenic highway designation for this roadway, and there is other development visible in the existing view including a solar generation facility and the existing Eldorado Substation and 115-kV transmission line. This viewpoint is approximately 3.5 miles from the proposed transmission line route, so the proposed project would be visible in background views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term changes to the middleground of the existing environment of KOP 7. Construction of new access roads, decommissioning of existing transmission towers, preparation of the transmission line tower structure sites, installation of the telecommunications line, and expansion of the Eldorado Substation would result in temporary generation of fugitive dust that could be visible from KOP 7 under certain conditions. Temporary clearing of vegetation would not be visible from KOP 7. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles could be visible but may not hold the attention of the viewer because the viewer would likely be traveling at high speeds.

New features of the proposed project in this view include the extension of the existing yard to install two 230-kV line positions to accommodate the new double-circuit line within the existing footprint of the Eldorado Substation and taller towers to support the proposed 230-kV transmission line that would replace the existing 115-kV transmission line. Operation of the proposed project would result in long-term changes to the middleground of the existing environment of KOP 7. Long-term changes would result from the addition of LSTs, associated conductors, the telecommunications line, and expansion of the Eldorado Substation in the background; these new facilities in the background would not be discernable from KOP 7. Areas permanently cleared of vegetation for access roads and transmission line towers would not be visible in the background in middleground or background views.

Development 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, or texture of the landform, vegetation, or structures in the existing environment. These changes would be located within the existing footprint of the Eldorado Substation and include extension of the existing yard to install two 230-kV line positions to accommodate the new double-circuit line. Changes to the existing environment would be consistent with the VRM Class III because the minor changes to the existing substation and installation of slightly larger towers would not be discernable in background views due to the distance, short duration of views for motorists on Highway 95, and likelihood that the weak contrast in color between the proposed LSTs and the existing environment would cause the structures to recede into the background. Therefore, development of the proposed transmission line and the expansion of the Eldorado Substation would result in a negligible adverse effect, and mitigation would not be required.

KOP 8: View from the Highway 164 Overpass in the Ivanpah Valley

KOP 8 is located within and includes views of land managed as VRI Class III. The sensitivity of this viewpoint is moderate to low: there is a high level of use, but visual resources are a low concern for most users and a low priority for public concern. The sensitivity of this viewpoint is considered low because most viewers would be travelers on I-15. Travelers that typically use this roadway are primarily concerned with reaching a destination as opposed to driving specifically for recreation or sightseeing, and the posted speed limit is 70 miles per hour. Additionally, there is no scenic highway designation for this roadway. Further, existing development in and around Primm, Nevada is visible in background views. This viewpoint is located approximately 5 miles from the proposed transmission line route, so the proposed project would be visible in background views. The contrast rating worksheet for this KOP is located in Appendix C.

Construction would result in short-term changes to the background of the existing environment of KOP 8. 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 the telecommunications line, 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. Temporary clearing of vegetation would not likely be visible from KOP 8. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles would be visible.

Operation of the proposed project would result in long-term changes to the background of the existing environment of KOP 8. Long-term changes would result from the addition of LSTs, associated conductors, the proposed Ivanpah Substation, and vegetation clearing. The proposed Ivanpah Substation would be visible in the background of KOP 8;

the LSTs, associated conductors, and telecommunications line would not be visible. The substation would introduce a new structure into the landscape that would contrast in color with the existing environment, would introduce new vertical lines, and would draw the attention of the viewer. 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 be visible as well, drawing the attention of the viewer by introducing contrast in color and texture. These changes would distract from views of the existing geologic formation present in the background.

Construction and operation would result in a moderate change in the color of the landform, a weak change in the line of vegetation, and a moderate contrast with existing structures in the background of KOP 8. The changes to the existing environment would be consistent with the VRI Class III designation assigned to these BLM-managed lands because the VRM Class III designation allows for moderate change. Additionally, mitigation measures AES-1, AES-2, and AES-3 would lessen the contrast that would be introduced to the existing colors in the viewshed and minimize the dominance of the substation and microwave tower within the view.

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The proposed project would result in minor adverse effects to visual resources temporarily due to construction activities and permanently due to the introduction of taller towers and new structures, including the proposed Ivanpah Substation and the microwave tower.

With respect to operational impacts associated with the permanent presence of the proposed project, of the eight KOP's evaluated, seven would conform with the established VRM or VRI classes and one would not conform (Table 3.2-1).

Table 3.2-1 Conformance with VRM or VRI Class

Key Observation Point	VRM/VRI Class	Distance	Sensitivity	Conformity Determination
KOP 1: View of the Transmission Corridor Looking Northeast toward the McCullough Mountain Range	VRM Class II and VRM Class III	Foreground and Middleground	Moderate	Does not Conform with VRM Class II
KOP 2: View from the South McCullough Wilderness Area	VRM Class II	Background	Moderate	Conforms
KOP 3: View from Interstate 15 near Jean, Nevada	VRM Class III	Seldom Seen	Low	Conforms
KOP 4: View from the Desert Oasis Apartments in Primm, Nevada	VRM Class III and VRI Class III	Foreground	Moderate to High	Conforms
KOP 5: View from Ivanpah Dry Lake, East of Interstate 15	VRM Class III	Middleground	Moderate to High	Conforms
KOP 6: View from Interstate 15 near Primm, Nevada	VRM Class III	Middleground	Low	Conforms
KOP 7: View from Highway 95 in the Eldorado Valley	VRM Class III	Background	Low	Conforms

Table 3.2-1 Conformance with VRM or VRI Class

Key Observation Point	VRM/VRI Class	Distance	Sensitivity	Conformity Determination
KOP 8: View from Highway 164 Overpass in the Ivanpah Valley	VRI Class III	Background	Low	Conforms with Mitigation

In addition to the measures proposed by the applicant specifically to minimize impacts on aesthetics and visual resources (APM AES-1 through APM AES-8), additional mitigation would be required to lessen impacts on visual resources to the greatest extent possible. Mitigation measures AES-1 and AES-2 would lessen the contrast in color and line that would be introduced by construction of the Ivanpah Substation, as shown in KOP 8.

CEQA Significance Determinations

IMPACT AES-1: Adverse Impact to a Scenic Vista
ess than signifi ant itho t itigation

Designated scenic vistas do not occur in the proposed project area; however, the telecommunications portion of the proposed project would traverse land designated VRM Class II, which is managed to preserve visual resources. Additionally, the proposed project would be located within the vicinity of the South McCullough Wilderness Area and the Wee Thump Joshua Tree Wilderness Area, both of which are managed as VRM Class I areas. Construction of new access roads, upgrades to existing transmission towers, and installation of the telecommunications line would result in temporary generation of fugitive dust that would be visible within the VRM Class II area and from both the South McCullough Wilderness Area and the Wee Thump Joshua Tree Wilderness Area. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles would be visible. However, impacts to visual resources due to construction would be temporary.

The telecommunications line would be strung on the existing 500-kV Eldorado–Lugo Transmission Line. This change would not be discernable as there is already an existing 500-kV transmission line in the viewshed. No change would be visible from the South McCullough Wilderness Area or the Wee Thump Joshua Tree Wilderness Area.

Because the telecommunications line would be strung on existing structures and not visibly discernable from wilderness areas, and impacts to visual resources would be limited to temporary construction activities, the proposed project would result in a less than significant impact under this criterion.

IMPACT AES-2: Substantially Degrade Existing Visual Character or Quality
ess than signifi ant ith itigation

As discussed under the Impacts by Key Observation Point section above, the proposed project would conflict with VRM or VRI objectives for one of the eight KOPs. At KOP 1, the proposed project would introduce moderate levels of contrast with the existing structures in the viewshed by introducing linear elements of a larger scale and more prominent color. This is the only KOP that shows views of VRM Class II areas; all other KOPs show views of VRM Class III or VRI Class III areas.

Overall, the proposed project would not result in substantial degradation of the landscape. The proposed project would be consistent with VRM or VRI objectives for seven of the eight KOPs due to distance; relatively low viewer concern by many of the temporary visitors to the area; and the fact that the proposed project would replace an existing line, repeating the patterns currently visible in the landscape. There would be two new structures constructed as part of the proposed project: the Ivanpah Substation and the microwave tower. As described above in MM AES-1, the applicant would consult with the BLM to paint these structures a color that would minimize visual contrast with the surrounding landscape, reducing the level of contrast that would be introduced. MM AES-2 would further reduce contrast in color and line that would be introduced by the proposed Ivanpah Substation by requiring the applicant to stain rock disturbed by clearing and grading activities. MM AES-3 would reduce the color contrast that would be introduced by a white microwave dish or cover by requiring the applicant to consult with the BLM prior to construction to chose a BLM approved color. Additionally, the proposed project would be located in an energy corridor already crossed by numerous transmission lines. Therefore, even though the proposed project would conflict with VRM or VRI objectives for one of the eight KOPs, the proposed project would not *s bstantially* degrade the existing visual character or quality of the landscape and would result in a less than significant impact under this criterion.

IMPACT AES-3: Create a New Source of Light or Glare
ess than signifi ant itho t itigation

Lighting would only be installed for the proposed Ivanpah Substation. The applicant would install manually operated substation lighting, which would only be required for non-routine nighttime work. Lighting would be directed downward and shielded to eliminate off-site light spill (APM AES-8). Therefore, the proposed project would result in a less than significant impact under this criterion.

NO IMPACT. Adverse Impact to Scenic Resources within a State Scenic Highway. The proposed project does not traverse any designated or eligible state scenic highways within the proposed 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 designated or eligible state scenic highway.

3.2.3.6 No Project / No Action Alternative

Under the No Project Alternative, the proposed project, including the transmission line, the proposed Ivanpah Substation, the telecommunications line, and all other components of the proposed project, would not be constructed. Therefore, none of the changes to the existing visual environment discussed in Section 3.2.3.5, "Proposed Project," would occur, and there would be no adverse impact to visual resources.

3.2.3.7 Transmission Alternative Route A

Regarding potential construction and operation aesthetics impacts to sensitive viewpoints, Transmission Line Alternative A is similar to the proposed project. Alternative A would be visible only from KOP 7; all other segments of this alternative would be identical to the proposed project, as discussed in Section 3.2.3.5, "Proposed Project."

Transmission Line Alternative A would be present, but not visually distinguishable from KOP 7. 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. In the far middleground, the alternative route 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 result in stronger overall visual contrast where the route would veer from the existing 115-kV transmission line route than the proposed project due to the structures not paralleling existing transmission facilities. However, these changes would still be consistent with a VRM Class III designation; therefore, implementation of transmission line Alternative A and the expansion of the Eldorado Substation would result in minor adverse effects.

Impacts from this alternative would be less than significant, and mitigation would not be required.

3.2.3.8 Transmission Alternative Route B

Regarding potential construction and operation aesthetics impacts to sensitive receptors, Transmission Line Alternative B is similar to the proposed project. Alternative B would be visible only from KOP 7; all other segments of this alternative would be identical to the proposed project, as discussed in Section 3.2.3.5, "Proposed Project."

Transmission Line Alternative B would be present but not visually distinguishable from KOP 7. This alternative route 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 result in stronger overall visual contrast where the route would veer from the existing 115-kV transmission line route than the proposed project due to the structures not paralleling existing transmission facilities. However, these changes would still be consistent with a VRM Class III designation; therefore, implementation of transmission line Alternative A and the expansion of the Eldorado Substation would result in minor adverse effects.

Impacts from this alternative would be less than significant, and mitigation would not be required.

3.2.3.9 Transmission Alternative Route C

Regarding potential construction and operation aesthetics impacts to sensitive receptors, Transmission Line Alternative C is similar to the proposed project. Alternative C would only differ from the proposed project analysis at KOPs 4, 5, and 6; all other segments of this alternative would be identical to the proposed project, as discussed in Section 3.2.3.5, “Proposed Project.”

The Transmission Line Alternative C route would not be visible from KOPs 4 and 5. This alternative would re-route the proposed transmission line to the west of the T~~t~~own of Primm, through the Spring Mountain Range, and would run the route along the west side of the Ivanpah Lake before it reconnected with the existing transmission line route. Implementation of this route would result in removal of the existing transmission line adjacent to the Desert Oasis Apartment Complex. These changes would result in stronger overall visual contrast where the route would veer from the existing 115-kV transmission line route than the proposed project due to the structures not paralleling existing transmission facilities. However, these changes would still be consistent with a VRM Class III designation; therefore, implementation of transmission line Alternative C would result in minor adverse effect from KOPs 4 and 5 and would lessen the visual impact on residents of the Desert Oasis Apartment Complex and recreational users of the Ivanpah Dry Lake.

This alternative also would not be visible in the views from KOP 6, which represents views from I-15. However, this alternative would still cross I-15, albeit in a different location and, therefore, would not lessen visual impacts to motorists along I-15.

Impacts from this alternative would be less than significant, and mitigation would not be required.

3.2.3.10 Transmission Alternative Route D and Subalternative E

Regarding potential construction and operational impacts to sensitive viewpoints, Transmission Line Alternative D and Subalternative E are similar to the proposed project. These alternatives would only differ from the proposed project analysis at KOPs 4, 5, and 6; all other segments of these alternatives would be identical to the proposed project as discussed in Section 3.2.3.5, “Proposed Project.”

Transmission Line Alternative D and Subalternative E would not be visible in the view from KOP 4. These alternatives would re-route the proposed transmission line to the east of the Town of Primm to match the footprint of an existing 500-kV transmission line. The route would cross the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of these routes would result in removal of the existing transmission line adjacent to the Desert Oasis Apartment Complex. These changes would be consistent with the VRM Class III designation for the area. Therefore, implementation of transmission line Alternatives D and E would result in no adverse effect from KOP 4 and would lessen the impacts to residents of the Desert Oasis Apartment Complex.

These alternatives would be visible from KOPs 5 and 6. These alternatives would route the transmission line closer to KOPs 5 and 6 and would result in stronger overall visual contrast due to the structures not paralleling existing transmission facilities along this alternative route; however, the increased visual contrast due to the proximity of the transmission line to the KOPs would represent only an incremental change and would not substantially change the analysis in Section 3.2.3.5, “Proposed Project.” Transmission Alternative D and Subalternative E would have the same visual impact on recreational users of the Ivanpah Dry Lake and motorists along I-15 as would the proposed project. .These changes would still be consistent with a VRM Class III designation; therefore, implementation of transmission line Alternative D and Subalternative E would only result in minor adverse effects.

While these alternatives would match the footprint of an existing 500-kV transmission line which would mimic the linear pattern of that line, these alternatives would require a new ROW and therefore would result in a slight increase in visual impacts. However, impacts from this alternative would still be less than significant, and mitigation would not be required.

3.2.3.11 Telecommunication Alternative (Golf Course)

Regarding potential construction and operation aesthetics impacts to sensitive receptors, the Golf Course Alternative is similar to the proposed project. This alternative would only differ from the proposed project analysis at KOP 8; all other segments of this alternative would be identical to the proposed project as discussed in Section 3.2.3.5, “Proposed Project.”

The Golf Course Alternative would consist primarily of installing the telecommunications line underground along Nipton Road for an additional 9 miles and stringing the telecommunications line along existing 33-kV distribution lines to connect with the proposed Ivanpah Substation. This alternative would result in moderate temporary impacts due to an additional segment of trenching along Nipton Road. The portion of the telecommunications line that would be strung along the existing 33-kV distribution lines would not result in a visual impact because the line would be imperceptible except at an extremely close distance.

This alternative would be installed in a new underground duct beneath the Primm Valley Golf Course. This would result in an increased visual impact to users of the Golf Course during the construction period due to trenching activities, exposure of soils, storage of construction equipment, and transportation of materials. These impacts would be temporary, and overall this alternative would only result in minor adverse visual effects.

Impacts from this alternative would be less than significant, and mitigation would not be required.

3.2.3.12 Telecommunication Alternative (Mountain Pass)

Regarding potential construction and operation aesthetics impacts to sensitive receptors, the Mountain Pass Alternative is similar to the proposed project. This alternative would only differ from the proposed project analysis at KOP 8; all other segments of this alternative would be identical to the proposed project as discussed in Section 3.2.3.5, “Proposed Project.”

The Mountain Pass Alternative would consist primarily of installing the telecommunications line underground along Nipton Road for an additional 9 miles and stringing the telecommunications line along existing 33-kV distribution lines to connect with the proposed Ivanpah Substation. This alternative would result in moderate temporary impacts due to an additional segment of trenching along Nipton Road.

The segment that would be strung along existing 33-kV distribution lines would traverse an area designated VRI Class II, which has stricter objectives for visual resources than the proposed route, which would cross areas with VRI Class III designations. The segment of the telecommunications line that would be strung along the existing 33-kV distribution lines would not result in a visual impact because the line would be imperceptible except at an extremely close distance. Impacts would be limited to construction activities including stringing the telecommunication line, transporting materials, storing equipment, and possibly constructing new or upgrading existing access roads. These impacts would be temporary, and overall this alternative would only result in minor adverse visual effects.

Impacts from this alternative would be less than significant, and mitigation would not be required.

3.2.4 Mitigation Measures

The following mitigation would be required to lessen impacts on aesthetics and visual resources:

MM AES-1: Painting the Ivanpah Substation. Prior to construction, the applicant will consult with the BLM to select an appropriate color from the BLM approved palette to paint any enclosed structures that would be constructed for the Ivanpah Substation. The applicant will submit photographs following substation construction to the BLM and the CPUC to document compliance with this measure.

MM AES-2: Rock Staining near the Ivanpah Substation. For areas that are cleared and/or graded to construct the Ivanpah Substation, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.

MM AES-3: Microwave Dish Color. Prior to construction, the color of the microwave dishes or covers must be approved by the BLM. White dishes or covers will be avoided to minimize color contrast with the existing landscape.

3.2.5 Whole of the Action / Cumulative Action

Below is a brief summary of information related to aesthetics in the BLM's ISEGS Final Environmental Impact Statement (FEIS) and the California Energy Commission's (CEC's) Final Staff Assessment (FSA) and Addendum. This section focuses on differences in the ISEGS setting and methodology compared with the setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the BLM and CEC for ISEGS.

3.2.5.1 ISEGS Setting

The ISEGS project would be developed on four square miles of BLM land west of I-15 and the northern half of the Ivanpah Dry Lake bed, east of the foot of the Clark Mountains. The ISEGS site consists of primarily bajada scrub with minimal surface disturbance. There is a vivid 416-foot rock formation at the center of the proposed site. The ISEGS project site would be collocated with the proposed Ivanpah Substation site. The existing visual character of this location and the potentially affected viewer groups are described in greater detail in Section 3.2.1.2, "Ivanpah and Eldorado Substations."

BLM and CEC staff determined that the Ivanpah Valley floor has moderate overall visual sensitivity (with moderate existing visual quality, moderately high viewer concern, and high viewer exposure), which was determined to be generally consistent with a Visual Resource Inventory (VRI) Class III assigned by the BLM for the area.

Key Observation Points

The BLM and the CEC selected KOPs that represent typical views of project components and views from sensitive locations. For the visual resources analysis in the ISEGS document, BLM and CEC staff selected the following 10 KOPs:

- KOP 1: View from Primm Valley Golf Course
- KOP 2: Second View from Primm Valley Golf Course

- KOP 3: View of Ivanpah 2 and 3 from I-15 near Yates Well Road (middleground-distance viewpoint)
- KOP 4: View of Ivanpah 1 from I-15 near Yates Well Road (middleground-distance viewpoint)
- KOP 5: View from I-15 at Nipton Road (background-distance viewpoint)
- KOP 6: View from the east side of Ivanpah Dry Lake
- KOP 7: View from the west side of Ivanpah Dry Lake
- KOP 8: View from Primm, Nevada
- KOP 9: View from the Umberci Mine in the Stateline Wilderness Area
- KOP 10: View from the Mojave National Preserve near the Benson Mine

A map showing these points in relation to the proposed ISEGS project, photos from these locations, and a description of the visual character of these views are included in the ISEGS FSA/DEIS.

Applicable Laws, Regulations, and Standards

The ISEGS project is subject to the same federal, State of California, and San Bernardino County laws, regulations and standards as EITP, as discussed in Section 3.2.2, "Applicable Laws, Regulations, and Standards."

3.2.4.2 Methodology

The methodologies used by the CEC and the BLM for the respective analyses to visual impacts are similar and consistent. The analysis of impacts to visual resources for the ISEGS FSA/DEIS was conducted using the methods typically used by the CEC to assess impacts to visual resources; CEC and BLM stated that this method and the findings that resulted from this analysis were essentially consistent with findings that would be obtained using the BLM VRM methodology as described in Section 3.2.3.3, "Methodology." The CEC's FSA Addendum used the same methodology, and the BLM's FEIS used the BLM VRM methodology. Ratings of visual sensitivity and the visual contrast that would be introduced by the proposed project in both the CEC and BLM documents were made based on field observation, photo documentation, and review of applicant-prepared simulations and project information.

~~Staff considered whether there would be a significant impact under NEPA using the following criteria~~The CEC and the BLM used the same criteria to assess impacts to visual resources, as follows:

~~•Significant impacts to visual resources are analyzed in terms of context and intensity (40 CFR 1508.27). Context considers the affected region and interest in and use of the region, among other factors. Intensity refers to the severity of the impact; for the analysis of impacts to visual resources, relevant factors include "unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands…," degree of controversy, degree of uncertainty about possible effects, degree to which an action may establish a precedent for future actions, and potential for cumulatively significant impacts.~~

~~Staff considered whether there would be a significant impact under CEQA using the following criteria:~~

- Would the project have a substantial adverse effect on a scenic vista?
- Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway?
- Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

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

~~Staff~~ The CEC additionally considered whether the project would violate any local laws, ordinances, or regulations related to visual resources, including light and glare.

3.2.4.3 Impacts

The CEC and the BLM have published the impacts described below related to visual resources for the ISEGS project.

CEC FSA Addendum Impact Conclusions

The CEC concludes that the Mitigated Ivanpah 3 ~~proposal~~project would result in significant and unavoidable adverse impacts to existing scenic resource values as seen in views from the following locations:

- Middle-ground-distance viewpoints on Highway I-15;
- Viewpoints in the Mojave National Preserve on the east face of Clark Mountain; and
- Viewpoints in the Stateline Wilderness Area, including the Umberci Mine and vicinity.

The CEC also concludes that the Mitigated Ivanpah 3 Project would result in impacts due to the introduction of new sources and light and glare due to the installation of three solar receivers. The impact due to the introduction of new sources of light and glare would be lessened with Conditions of Certification TRANS-3 and TRANS-4. However, although these measures would reduce the hazard potential of the project and lessen the overall impact due to glare, the solar receivers would still represent a visually dominant feature, potentially interfering with scenic views of Clark Mountain from the valley floor.

The project would be sited entirely on BLM-managed public lands managed according to the CDCA Plan. With a plan amendment, the ISEGS project would conform to the BLM's CDCA plan. The visual resource goals and policies contained in the San Bernardino County General Plan Conservation and Open Space Elements would apply only to infrastructure and construction activities on private or County land. Therefore, the Mitigated Ivanpah 3 Alternative would conform with all applicable laws and regulations for visual resources.

BLM's FEIS Impact Conclusions

Construction

~~It is estimated that project construction would take place over a 48-month period. Impacts to visual resources during the construction phase of the ISEGS project would result from construction parking and laydown areas, including temporary fabrication buildings; exposed soils due to grading of the 4-square-mile project site; fugitive dust from grading and other construction-related activities; and nighttime construction lighting. These activities would create a strong degree of visual change from vantage points along I-15, in the Clark Mountains, and from the Mojave National Preserve.~~

~~To address fugitive dust concerns, the BLM and CEC staff recommends Conditions of Certification AQ-SC3, AQ-SC4, and AQ0SC7 as well as SOIL&WATER-1, which would reduce impacts to visual resources from fugitive dust to less than significant levels. To address potential light pollution impacts, staff recommend Condition of Certification VIS-4 (described in Section 3.2.5.4, "Mitigation Measures"), which would reduce impacts due to nighttime construction to less than significant. To address long-term impacts due to grading of the site, staff recommends Condition of Certification BIO-14, referenced in Condition of Certification VIS-3 (described in Section~~

~~3.2.5.4, "Conditions of Certification/Mitigation Measures" below), which requires the revegetation of all disturbed soil surfaces.~~

It is estimated that project construction would take place over a 40-month period. Impacts to visual resources during the construction phase of the ISEGS project would result from construction parking and laydown areas, including temporary fabrication buildings; exposed soils due to grading of the 4-square-mile project site; fugitive dust from grading and other construction-related activities; and nighttime construction lighting. The BLM concludes that these visual changes from construction would be incompatible with the moderate overall visual sensitivity of the Ivanpah Valley, as experienced from affected viewpoints on the highway, and the high overall visual sensitivity of viewpoints in the Clark Mountains, and would last for a period of several years; therefore, construction would result in a potentially adverse impact.

Mitigation Measures BIO-14, BIO-27, and VIS-3 would be implemented to lessen the long-term effects of site grading. Impacts due to fugitive dust are addressed in Mitigation Measures AQ-SC3 and AQ-SC7. To address potential light pollution impacts, Mitigation Measure VIS-4 would be implemented.

Operation

Scenic Vistas

There are no designated scenic vistas in the ISEGS project area; however, given the high scenic quality and high levels of recreational use, for the purpose of the analysis, the BLM considered viewpoints within the Clark Mountains in the Stateline Wilderness Area (KOP 9 below) and viewpoints within the Mojave National Preserve (KOP 10 below) equivalent to designated scenic vistas. Additionally, BLM stated that views of the Clark Mountains from I-15 could be considered a designated scenic vista in light of the county scenic highway designation for I-15.

As described below for KOPs 9 and 10, which represent views from the State Wilderness Area and the Mojave National Preserve, respectively, the BLM concluded that the project would alter panoramic views of the Ivanpah Valley from mostly undisturbed desert scrub landscape to views of industrial development dominated by expansive mirror arrays, 459-foot-tall solar collector towers, substantial grading, and associated project components and equipment. BLM concluded that the resulting visual change would constitute a substantial adverse visual effect.

Views from the I-15 corridor would not be substantially obstructed by the ISEGS project, but glare from the project could strongly alter the character of these views.

State Scenic Highways

There are no eligible or designated State Scenic Highways within the ISEGS project area. The project would be located adjacent to I-15, immediately adjacent to a prominent rock outcropping that is a landmark for viewers in the area. BLM states that the project would not directly damage the rock outcropping, but would dramatically alter its visual setting.

Existing Visual Character

The BLM and CEC staff determined that the Ivanpah Valley floor has moderate overall visual sensitivity (with moderate existing visual quality, moderately high viewer concern and high viewer exposure), which is generally consistent with VRI Class III. Impacts of the ISEGS project to visual character from the 10 KOPs are described below. The project would result in an adverse impact from the following KOPs:~~(as seen from Key Observation Points)~~

~~As noted in Section 3.2.5.1, "Setting," BLM and CEC staff determined that the Ivanpah Valley floor has moderate overall visual sensitivity (with moderate existing visual quality, moderately high viewer concern, and high viewer exposure), which is generally consistent with VRI Class III. The BLM and CEC determined that the ISEGS project~~

~~would result in potentially substantial adverse impacts to existing scenic resources from six of the 10 KOPs, as described below.~~

KOPs 1-2: View from Primm Valley Golf Course

From these vantage points, the ISEGS project would create a strong level of contrast by introducing a strong vertical line and form, the effect of which would be amplified by reflected sunlight; a textural contrast with the existing character of the desert scrub landscape; and contrast in hue and brightness with the existing undisturbed soil surfaces. Additionally, the ISEGS project would exhibit strong special and scale dominance. The ISEGS document concludes that while the strong level of visual change from this vantage point would result in a potentially significant impact given the moderate overall sensitivity of the Ivanpah Valley, implementation of ~~Conditions of Certification~~Mitigation Measures VIS-1 and VIS-2 (described in Section 3.2.5.4, "Mitigation Measures") ~~would mitigate the impact to less than significant levels~~would lessen the impact.

KOPs 3-4: Middleground-distance viewpoints on I-15

From these vantage points, the ISEGS project would introduce a strong vertical line and form, which would create a strong level of visual contrast that would be amplified by reflected sunlight. Additionally, the vast scale and visual magnitude of the mirrors would create a strong textural contrast with the existing character of the desert scrub landscape, and visible areas of disturbed soil could create a strong contrast with the hues and brightness of the existing undisturbed soil surface. This strong level of overall visual change would not be compatible with the moderate overall sensitivity level of the Ivanpah Valley as seen by motorists in the visual middle-ground and would result in a potentially adverse visual impact~~. BLM and CEC staff stated that implementation of Condition of Certification VIS-1 would lessen the impact to visual resources from KOPs 3 and 4, but would not fully address the level of contrast that would be introduced by the ISEGS project~~. Mitigation Measure VIS-1 would lessen the contrast introduced by the mirror arrays.

KOP 5: Background-distance viewpoint on I-15

From this vantage point, the ISEGS project would introduce a moderate level of visual contrast and project dominance would be moderate (or co-dominant). Due to the large numbers of motorists traveling along I-15 and the fact that this segment of I-15 has been designated a County scenic route by San Bernardino County, viewer sensitivity from this KOP would be moderate. The BLM concluded that visual impacts from background distance zone views would be compatible with moderate levels of sensitivity; however, the project would result in a potentially adverse and unavoidable impacts from middleground and foreground distance zones.

KOP 9: View from the Umberci Mine in the Stateline Wilderness Area

From this vantage point, the ISEGS project would introduce strong contrast in form, line, color, and texture. Due to the relative proximity of the project and the elevated angle of the view, the scale and spatial dominance of the project would be high, and the bright solar receivers would obstruct views of the Clark Mountains to a moderate to strong degree. The strong degree of visual contrast that would be introduced by ISEGS at this KOP would not be compatible with the moderate overall visual sensitivity of the Ivanpah Valley or the high overall sensitivity of the Stateline Wilderness area. Therefore, the project would result in an ~~re would be a significant~~ adverse impact to visual resources from this viewpoint even with the incorporation of mitigation.

KOP 10: View from the Mojave National Preserve near the Benson Mine

From this vantage point, the ISEGS project would introduce strong contrast in form, line, color, and texture. From the elevated viewpoint, the mirror arrays would be a dominant feature in the view and would produce nuisance glare at various periods throughout the day. The strong level of contrast that would be introduced by the ISEGS project from this vantage point would not be compatible with the overall moderate visual sensitivity of the Ivanpah Valley and would disrupt scenic views from the Mojave National Preserve. Therefore, ~~there would be a significant~~ the project would result in an adverse impact to visual resources from this viewpoint even with the incorporation of mitigation.

The BLM ~~and the CEC staff~~ determined that ~~the project would not result in a substantial adverse impact to existing scenic resources from four of the 10 KOPs, as described below~~ the contrast that would be introduced by the project would be compatible with the sensitivity ratings for the following KOPs.

~~KOP 5: Background-distance viewpoint on I-15~~
~~From this vantage point, the ISEGS project would introduce a moderate level of visual contrast and project dominance would be moderate (or co-dominant). Impacts to visual resources from this KOP would be less than significant because moderate visual contrast would be consistent with the site's moderate overall sensitivity. However, staff notes that the degree of contrast would increase as motorists travel toward the project site, increasing the level of visual contrast from middleground distances and resulting in potentially significant impacts to visual resources.~~

KOP 6: View from the east side of the Ivanpah Dry Lake
From this vantage point, the overall visual change introduced by the ISEGS project would be weak to moderate, due to the distance and the low, oblique viewing angle. ~~This level of visual change would be compatible with the overall moderate visual sensitivity of the project area, and therefore impacts to visual resources from this viewpoint would be less than significant without mitigation.~~BLM concluded that the weak to moderate levels of overall project visual change would be compatible with the moderate overall visual sensitivity of the setting from this viewpoint.

KOP 7: View from the west side of Ivanpah Dry Lake
From this vantage point, the ISEGS project would introduce weak to moderate levels of overall visual change due to the distance and the low, oblique viewing angle. BLM concluded that the weak to moderate levels of overall project visual change would be compatible with the moderate overall visual sensitivity of the setting from this viewpoint. ~~These would be compatible with the moderate overall visual sensitivity of the project area; therefore, impacts to visual resources from this viewpoint would be less than significant without mitigation.~~

KOP 8: View from Primm, Nevada

From this vantage point, viewer exposure and orientation to the ISEGS project site would be limited. Visual quality at this location is relatively low due to development in the Town of Primm. Due to the oblique angle and distance, overall visual change from this vantage point would be weak to moderate, and would be compatible with the moderate overall visual sensitivity of the Ivanpah Valley. BLM concluded that the weak to moderate levels of overall project visual change would be compatible with the moderate overall visual sensitivity of the setting from this viewpoint.~~Impacts would be less than significant without mitigation.~~

~~CEQA Impact Discussion~~

~~The BLM and CEC staff additionally determined that the ISEGS project would result in significant impacts to visual resources under the four CEQA criteria listed above in Section 3.2.5.2, "Methodology." Impacts to scenic vistas, to scenic highways, to the existing visual character of the project area, and due to light and glare are summarized below.~~

~~Scenic Vistas~~

~~There are no designated scenic vistas in the ISEGS project area; however, given the high scenic quality and high levels of recreational use, for the purpose of the analysis, the CEC and the BLM staff considered viewpoints within the Clark Mountains in the Stateline Wilderness Area (KOP 9) and viewpoints within the Mojave National Preserve (KOP 10) equivalent to designated scenic vistas. Additionally, CEC and BLM staff stated that views of the Clark Mountains from I-15 could be considered a designated scenic vista in light of the county scenic highway designation for I-15.~~

~~As described above for KOPs 9 and 10, which represent views from the State Wilderness Area and the Mojave National Preserve, respectively, the ISEGS FSA/DEIS concluded that the project would alter panoramic views of the~~

~~Ivanpah Valley from mostly undisturbed desert scrub landscape to views of industrial development dominated by expansive mirror arrays, 459-foot-tall solar collector towers, substantial grading, and associated project components and equipment. BLM and CEC staff concluded that the resulting visual change would constitute a substantial adverse visual effect.~~

~~Views from the I-15 corridor would not be substantially obstructed by the ISEGS project, but glare from the project could strongly alter the character of these views.~~

~~State Scenic Highways~~

~~There are no eligible or designated State Scenic Highways within the ISEGS project area. The project would be located adjacent to I-15, immediately adjacent to a prominent rock outcropping that is a landmark for viewers in the area. The ISEGS FSA/DEIS states that the project would not directly damage the rock outcropping, but would dramatically alter its visual setting.~~

~~Existing Visual Character~~

~~The BLM and CEC staff determined that the Ivanpah Valley floor has moderate overall visual sensitivity (with moderate existing visual quality, moderately high viewer concern and high viewer exposure), which is generally consistent with VRI Class III. Impacts of the ISEGS project to visual character from the 10 KOPs are described above. Impacts to visual resources from six of the 10 KOPs would be significant and adverse even with implementation of Conditions of Certification VIS-1 through VIS-4.~~

Light and Glare

Glare is considered a major issue of concern for the ISEGS project and is analyzed as a safety concern in the Traffic and Transportation section of the ~~FSA/DEIS~~FEIS. ~~In that section, the BLM and CEC staff recommended Conditions of Certification~~Mitigation Measures TRANS-3 and TRANS-4 would~~to~~ lessen the effects of glare. The ~~FSA/DE~~FEIS~~IS~~ visual analysis concludes that even with the incorporation of these conditions, glare from the ISEGS project would dominate the view, would alter the character of the view, and could detract from the public's ability to enjoy views.

Additionally, light pollution from nighttime construction and permanent FAA-required safety lighting would impact night sky views, particularly from the Mojave National Preserve~~. BLM and CEC staff recommended Condition of Certification~~. Mitigation Measure VIS-~~4,~~4 ~~which~~ would require that lighting be shielded and directed downward (with the exception of FAA-required safety lighting) and would ~~mitigate~~ lessen the impact to night sky views from the Mojave National Preserve ~~to less than significant levels~~; however, FAA safety lighting would result in an adverse and unavoidable impact on nighttime views from the Mojave National Preserve.~~.~~

~~Compliance with Local Laws, Ordinances, and Regulations~~

~~The BLM and CEC staff concluded that the project would not comply with three applicable goals and policies of San Bernardino County as stated in the San Bernardino County General Plan Conservation and Open Space Element. The goals and policies with which the ISEGS project would conflict are:~~

- ~~Conservation Element Goal D/CO 1, which calls for preservation of the unique environmental features and natural resources of the Desert Region, including scenic vistas~~
- ~~Open Space Element Goal OS 5 and Policy OS 5.2, which states that the county will maintain and enhance the visual quality of county scenic routes and requires that development along scenic routes demonstrate compatibility with existing scenic resources through a visual analysis~~

Closure and Decommissioning

When ISEGS is no longer in use, the applicant will decommission the project as ~~outlines~~ outlined in the Draft Closure, Revegetation, and Rehabilitation Plan. Original contours will be restored and the site will be revegetated; however, given the difficulty of revegetating in an arid region and given the prominent color contrast between graded, disturbed soils and undisturbed soils in the vicinity, decommissioning of the project and visual recovery would likely occur over a long period of time.

3.2.4.4 Conditions of Certification/Mitigation Measures

The ISEGS FSA Addendum recommends that the ~~following~~ Conditions of Certification described below be required by the CEC ~~and the BLM~~ to lessen impacts to ~~noise~~ visual resources if the project is approved. ~~:~~ The BLM recommends the same Mitigation Measures in the FEIS.

VIS-1. The project owner will treat the surfaces of all project structures and buildings visible to the public such that (a) their colors minimize visual intrusion and contrast by blending with the existing tan and brown color of the surrounding landscape, (b) their colors and finishing do not create excessive glare, and (c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors will be non-specular and non-reflective, and the insulators will be non-reflective and non-refractive.

This mitigation measure also outlines the verification process to ensure that the measure is followed and to document its success.

VIS-2. At the request of and in consultation with BLM's Authorized Officer, the CEC's Compliance Project Manager (CPM), and the golf course owner, the project owner will prepare a perimeter landscape screening plan to reduce the visibility of the proposed ISEGS project as seen from the golf course. The intent of the plan will be to provide screening of the power project, particularly the mirror fields, while retaining as much of the scenic portion of the overall views of Ivanpah Valley and Clark Mountains as feasible. The design approach will be developed with prior consultation with the golf course owner, and implemented only at the golf course owner's request. The project owner will submit to BLM's Authorized Officer and CPM for review and approval, and simultaneously to the golf course owner for review and comment, a preliminary conceptual landscaping plan whose objective is to provide an attractive visual screen to views of the ISEGS project mirror fields. Upon approval by BLM's Authorized Officer, the CPM, and the golf course owner, the project owner will submit to BLM's Authorized Officer and the CPM for review and approval, and simultaneously to the golf course owner for review and comment, a landscaping plan the proper implementation of which will satisfy these requirements. The plan will include:

A. A detailed landscape, grading, and irrigation plan, at a reasonable scale. The plan will demonstrate how the requirements stated above will be met. The plan will provide a detailed installation schedule demonstrating installation of as much of the landscaping as early in the construction process as is feasible in coordination with project construction.

B. A list (prepared by a qualified professional arborist familiar with local growing conditions) of proposed species, specifying installation sizes, growth rates, expected time to maturity, expected size at five years and at maturity, spacing, number, availability, and a discussion of the suitability of the plants for the site conditions and mitigation objectives, with the objective of providing the widest possible range of species from which to choose.

C. Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project.

D. A procedure for monitoring for and replacement of unsuccessful planting for the life of the project.

E. One set each for BLM's Authorized Officer and the CPM of 11-inch-by-17-inch color photo simulations of the proposed landscaping at five years and 20 years after planting, as viewed from adjoining segments of I-15.

This plan will not be implemented until the project owner receives final approval from BLM's Authorized Officer and the CPM.

This mitigation measure also outlines the verification process to ensure that the measure is followed and to document its success.

VIS-3. The project owner will revegetate disturbed soil areas to the greatest practical extent, as described in Condition of Certification BIO-14/Mitigation Measure BIO-14. To address specifically visual concerns, the required Closure, Revegetation, and Rehabilitation Plan will include reclamation of the area of disturbed soils used for laydown, project construction, and siting of the substation and other ancillary operation and support structures.

For verification of this measure, the ~~ISEGS document~~CEC refers to Certificate of Certification BIO-14 and the BLM refers to Mitigation Measure BIO-14.

VIS-4. To the extent feasible, consistent with safety and security considerations, the project owner will design and install all permanent exterior lighting and all temporary construction lighting such that (a) lamps and reflectors are not visible from beyond the project site, (b) lighting does not cause excessive reflected glare, (c) direct lighting does not illuminate the nighttime sky, except for required FAA aircraft safety lighting, (d) illumination of the project and its immediate vicinity is minimized, and (e) the plan complies with local policies and ordinances. The project owner will submit to BLM's Authorized Officer and the CPM for review and approval, and simultaneously to the County of San Bernardino for review and comment, a lighting mitigation plan that includes the following:

A. Location and direction of light fixtures will take the lighting mitigation requirements into account.
B. Lighting design will consider setbacks of the project features from the site boundary to aid in satisfying the lighting mitigation requirements.
C. Lighting will incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated.
D. Light fixtures that are visible from beyond the project boundary will have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security.
E. All lighting will be of minimum necessary brightness consistent with operation safety and security.
F. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) will have (in addition to hoods) switches, time switches, or motion detectors so that the lights operate only when the area is occupied.

This mitigation measure also outlines the verification process to ensure that the measure is followed and to document its success.

3.2.5 Combined Impact of EITP and ISEGS

The CEQA and NEPA EITP and ISEGS impact analyses for visual resources were based on similar significance criteria that evaluated to what extent the proposed projects would impact scenic vistas, impact views from designated scenic highways, degrade the existing visual character of the surrounding landscape, and introduce new sources of light and glare.

Scenic Vistas

Both the EITP and the ISEGS documents state that there are no designated scenic vistas in the Ivanpah and Eldorado valleys. However, in the ISEGS documents, the CEC and the BLM considered viewpoints within the Clark Mountains in the Stateline Wilderness Area and viewpoints within the Mojave National Preserve equivalent to designated scenic vistas due to high recreational use. Additionally, BLM stated that views of the Clark Mountains from I-15 could be considered a designated scenic vista in light of the county scenic highway designation for I-15. The CEC and the BLM concluded that from these viewpoints, significant and unavoidable impacts would occur due to contrast introduced by the ISEGS project.

The CPUC and the BLM concluded that impacts from the EITP would be less than significant under this criterion and would be inconsequential when combined with the impacts of the ISEGS project. The EITP primarily consists of upgrading a single-circuit 115-kV transmission line to a double-circuit 230-kV transmission line; the visual impacts of such an upgrade would be incremental and less than significant. The component of the EITP that would result in the greatest level of visual contrast is the Ivanpah Substation. If the Ivanpah Substation and the ISEGS project were both constructed, the Ivanpah Substation would be located within the ISEGS project layout. The Ivanpah Substation would amplify the effect of the ISEGS project, but would be a less dominant visual element in the viewshed compared with the thousands of mirror arrays and the three 459-foot-tall solar collectors. The combined effect would be incrementally more than the impact of the ISEGS project alone.

Scenic Highways

Both the EITP and the ISEGS documents state that there are no designated scenic highways in the Ivanpah and Eldorado valleys that would have views of either project; therefore, there is no impact under this criteria.

Degrade Existing Visual Character

Both the EITP and the ISEGS documents analyzed impacts on visual resources using the BLM VRM methodology or a similar equivalent (in the case of the CEC documents). In the ISEGS documents, the CEC and the BLM determined that the ISEGS project would result in a significant or adverse impact to middleground distance viewers on I-15, in the Clark Mountains within the Mojave National Preserve, and within the Stateline Umberci Mine and the vicinity.

Because the EITP would constitute primarily the upgrading of a single-circuit 115-kV transmission line to a double-circuit 230-kV transmission line; the visual impacts of the project would be largely incremental. Therefore, the impact would be considered potentially significant only for the most sensitive viewing locations; in the EITP analysis the Desert Oasis Apartment Complex is considered the viewing location with the highest degree of sensitivity. However, the ISEGS project would not be visible from this location. Therefore, there is no combined impact.

The Ivanpah Substation and portions of the upgraded transmission line would be visible with the ISEGS project in middleground views from I-15, views in the Clark Mountains within the Mojave National Preserve and within the Stateline Umberci Mine and the vicinity. As noted above, if the Ivanpah Substation and the ISEGS project were both constructed, the Ivanpah Substation would be located within the ISEGS project layout. Therefore, the Ivanpah Substation would amplify the effect of the ISEGS project, but would be a less dominant visual element in the viewshed compared with the thousands of mirror arrays and the three 459-foot-tall solar collectors. The combined effect would be incrementally more than the impact of the ISEGS project alone.

Light and Glare

The EITP and the ISEGS project combined would result in a less than significant impact due to the introduction of new sources of glare. The EITP would be constructed of non-speculative materials and therefore would not introduce a new source of glare. Although glare is considered a major issue of concern for the ISEGS project, MMs TRANS-3 and TRANS-4 would lessen the effects of glare for the ISEGS project. Because EITP would not introduce a source of glare and because the ISEGS project would result in a less than significant impact due to the introduction of glare, the EITP and ISEGS combined would result in a less than significant impact due to the introduction of glare.

Lighting requirements for the EITP and ISEGS would result in a significant impact on views from the MNP. Lighting for the EITP would only be installed for the proposed Ivanpah Substation, would be operated manually and would be directed downward and shielded to eliminate off-site light spill (APM AES-8). The EITP would not contribute to this significant impact. However, light pollution from nighttime construction and permanent FAA-required safety lighting for the ISEGS project would impact night sky views, particularly from the Mojave National Preserve. Mitigation Measure VIS-4 would require that lighting be shielded and directed downward (with the exception of FAA-required safety lighting) and would lessen the impact to night sky views from the Mojave National Preserve; however, FAA safety lighting for the ISEGS project would result in an adverse and unavoidable impact on nighttime views from the Mojave National Preserve. Although the EITP would not result in an impact due to the introduction of a new source of light, because the ISEGS project would result in a significant impact on views from the MNP due to the introduction of new sources of light, the EITP and ISEGS combined would result in a significant impact due to the introduction of light.

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3.3 Air Quality and Greenhouse Gases

This section contains a description of the environmental setting, regulatory setting, and potential impacts associated with the construction and operation of the proposed project and alternatives with respect to air quality and greenhouse gases (GHGs).

3.3.1 Environmental Setting

The project extends from the Ivanpah Valley in San Bernardino County, California, to the Eldorado Valley in Clark County, Nevada. The California section of the proposed project lies within the easternmost portion of San Bernardino County in the Mojave Desert Air Basin. The Nevada section lies within southern Clark County.

3.3.1.1 Climate

The proposed project area is mostly rural. There are no weather stations close to the proposed route. However, weather stations at the Naval Air Weapons Station (NAWS) China Lake, approximately 120 miles west of the project, and at the McCarran Airport in Las Vegas Valley, approximately 20 miles north of the project, have been used to provide representative data for the project.

At the NAWS China Lake weather station, the climate is semi-arid desert with average annual precipitation of about 2 inches. Gusty winds occur in late winter and early spring months due to cold fronts. Strong westerly winds can bring up the wind speed from an average of 25 knots to 35 knots. Due to the surrounding mountainous topography and to wind speeds, there can be transfer of pollutants from one area to another. Summers have warm, dry days and cool nights. Daytime temperatures can rise to 100 degrees Fahrenheit (°F) or above and fall to the mid-60s during the night. Average annual snowfall is minimal (NCDC 1996).

At the McCarran Airport weather station summers are typical for deserts with semi-arid conditions. Daytime conditions are warm and dry with high temperatures around 100°F and above, and nights are cool with temperatures in the mid-70s. Moist summer air can spawn severe thunderstorms which can result in heavy soil erosion in the foothills. The Sierra Nevada Mountains of California act as barriers in preventing moisture from the Pacific Ocean. As a result, there are not many rainy days in the area. Snowfall is rare, although there have been exceptions. Winds that produce major storms are from the southwest to the valley or from the northwest through the pass (NCDC 1996).

3.3.1.2 Air Quality

The Federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (U.S. EPA) to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants that are emitted from numerous and diverse sources. These pollutants are considered harmful to public health and the environment. U.S. EPA has set NAAQS for seven criteria pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone, particulate matter less than or equal to 10 micrometers in diameter (PM_{10}), particulate matter less than or equal to 2.5 micrometers in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). Ozone is not emitted directly from emission sources but is created in the atmosphere via a chemical reaction between oxides of nitrogen (NO_X) and volatile organic compounds (VOCs) in the presence of sunlight. As a result, NO_X and VOCs are often referred to as ozone precursors and are regulated as a means to prevent ground-level ozone formation.

The State of California has also established California Ambient Air Quality Standards (CAAQS) for these criteria pollutants, as well as ambient air quality standards for sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility-reducing particles (VRPs). Clark County, Nevada, has also established ambient air quality standards (AAQS) that in most instances are equivalent to NAAQS. The NAAQS, Clark County AAQS, and CAAQS are summarized in Table 3.3-1.

Table 3.3-1 Summary of National, California, and Clark County Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS		CAAQS	Clark County AAQS
		Primary	Secondary		
CO	8-hour	9 ppm[(a)]	—	9 ppm	9 ppm
	1-hour	35 ppm[(a)]	—	20 ppm	35 ppm
Lead	3-month (rolling average)	0.15 μg/m^3	0.15 μg/m^3	—	—
	Quarterly	1.5 μg/m^3	1.5 μg/m^3	—	1.5 μg/m^3
	30-day	—	—	1.5 μg/m^3	—
NO_2	Annual	0.053 ppm	0.053 ppm	0.030 ppm	0.053 ppm
	1-hour	0.100 ppm[(e)]	—	0.18 ppm	—
Ozone	8-hour	0.075 ppm[(b)] (0.08 ppm)[(b,c)]	0.075 ppm[(b)] (0.08 ppm)[(b,c)]	0.070 ppm	0.08 ppm
	1-hour	—	—	0.09 ppm	0.12 ppm
PM_{10}	Annual	—	—	20 μg/m^3	50 μg/m^3
	24-hour	150 μg/m^3 [(d)]	150 μg/m^3 [(d)]	50 μg/m^3	150 μg/m^3
$PM_{2.5}$	Annual	15.0 μg/m^3 [(e)]	15.0 μg/m^3 [(e)]	12 μg/m^3	15 μg/m^3
	24-hour	35 μg/m^3 [(f)]	35 μg/m^3 [(f)]	—	65 μg/m^3
SO_2	Annual	0.03 ppm	—	—	0.03 ppm
	24-hour	0.14 ppm	—	0.04 ppm	0.14 ppm
	3-hour	—	0.5 ppm	—	0.50 ppm
	1-hour	—	—	0.25 ppm	—
Sulfates	24-hour	—	—	25 μg/m^3	—
H_2S	1-hour	—	—	0.03 ppm	—
Vinyl chloride	24-hour	—	—	0.01 ppm	—
Visibility reducing particles	8-hour	—	—	Extinction coefficient of 0.23 per km visibility of 10 miles or more due to particles when relative humidity is less than 70%.	—

Source: CARB 2008

Notes:

[a]Not to be exceeded more than once per year.

[b]To attain this standard, the 3-year average of the fourth highest daily maximum 8-hour average concentration over a year must not exceed the standard.

[c]1997 standard. The implementation rules for this standard will remain in place for implementation purposes as U.S. EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

[d]Not to be exceeded more than once per year on average over 3 years.

[e]To attain this standard, the 3-year average of the 98th percentile must not exceed the standard.

[f]The 3-year average of the 98th percentile of 24-hour concentrations within an area must not exceed the standard.

Key:

CO = carbon monoxide
km = kilometer
H_2S = hydrogen sulfide
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PM_{10} = particulate matter with a diameter of 10 micrometers or less
ppm = parts per million
SO_2 = sulfur dioxide
μg/m^3 = micrograms per cubic meter

The U.S. EPA compares ambient air criteria pollutant measurements with NAAQS to assess air quality in regions within the United States. Similarly, the California Air Resources Board (CARB) compares air pollutant measurements in California with CAAQS. Based on these comparisons, regions are placed in one of the following categories:

- Attainment – A region is "in attainment" if monitoring shows ambient concentrations of a specific pollutant are less than or equal to NAAQS or CAAQS. In addition, an area that has been re-designated from nonattainment to attainment is classified as a "maintenance area" for 10 years to ensure that the air quality improvements are sustained.
- Nonattainment – If the NAAQS or CAAQS are exceeded for a pollutant, the region is designated as nonattainment for that pollutant.
- Unclassifiable – An area is unclassifiable if the ambient air monitoring data are incomplete and do not support a designation of attainment or nonattainment.

The closest representative ambient air monitoring station to the project is in Jean, Nevada. The maximum 8-hour ozone concentration at this station in 2008 was 0.078 parts per million (ppm). For PM_{10}, the maximum 24-hour average concentration in 2008 was 96 micrograms per cubic meter ($\mu g/m^3$) and the annual average concentration was 14 $\mu g/m^3$ (U.S. EPA 2009a). In California, an ambient air monitoring station is located in the Mojave National Preserve. The maximum 8-hour ozone concentration at this station in 2008 was 0.086 ppm (U.S. EPA 2009a).

The portion of the Mojave Desert Air Basin where project activities would occur is currently designated as nonattainment for PM_{10} (NAAQS and CAAQS) and ozone (CAAQS only). This portion of the basin is designated as attainment and/or unclassifiable for all other pollutant NAAQS and CAAQS. The portion of Clark County where project activities would occur is currently designated nonattainment for the ozone NAAQS. This portion of the county is designated as attainment and/or unclassifiable for all other pollutant NAAQS. The air quality designations of areas of project activity are summarized in Table 3.3-2.

Hazardous air pollutants (HAPs; also referred to as toxic air contaminants [TACs] in California) are air pollutants suspected or known to cause cancer, birth defects, neurological damage, or other health issues. HAPs can originate from mobile sources such as vehicles or off-road equipment. Diesel engines emit a complex mix of pollutants, the most visible of which are very small carbon particles or "soot," known as diesel particulate matter (DPM). CARB has identified DPM as a TAC. Except for lead, there are no established ambient air quality standards for HAPs. Instead, these compounds are managed on a case-by-case basis depending on the quantity and type of emissions and proximity of potential receptors.

3.3.1.3 Greenhouse Gases and Climate Change

According to the U.S. EPA, "Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer)" (U.S. EPA 2009b). Climate change may be affected by a number of factors including solar radiation, ocean circulation, and human activities such as burning fossil fuels or altering the Earth's surface through deforestation or urbanization, among other factors (U.S. EPA 2009c).

Table 3.3-2 Attainment Status within the Proposed Project Area

Pollutant	Desert Portion of San Bernardino County, California, in the Mojave Desert Air Basin[a]		Clark County, Nevada[b]
	NAAQS	CAAQS	NAAQS
CO	A	A	A
Lead	A	A	A/U
NO_2	A/U	A/U	A/U
Ozone	A/U	Moderate NA	NA
PM_{10}	Moderate NA	NA	A
$PM_{2.5}$	A/U	A/U	A/U
SO_2	A/U	A/U	A/U
Sulfates	--	A	--
H_2S	--	U	--
VRP	--	U	--

Sources: MDAQMD 2008, U.S. EPA 2009a

Notes:
[a]Refers only to the portion of San Bernardino County, California, and the Mojave Desert Air Basin where project activities would occur.
[b]Refers only to the portion of Clark County, Nevada where project activities would occur.

Key:
A = attainment
A/U = attainment/unclassifiable
CO = carbon monoxide
H_2S = hydrogen sulfide
km = kilometer
NA = nonattainment
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PM_{10} = particulate matter with a diameter of 10 micrometers or less
ppm = parts per million
SO_2 = sulfur dioxide
U = unclassifiable
μg/m^3 = micrograms per cubic meter

GHGs refer to gases that trap heat in the atmosphere, causing a greenhouse effect. As defined in California Assembly Bill (AB) 32, GHGs include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6). Atmospheric concentrations of the two most important directly emitted, long-lived GHGs—CO_2 and CH_4—are currently well above the range of atmospheric concentrations that occurred over the last 650,000 years (Pew Center 2008). According to the Intergovernmental Panel on Climate Change (IPCC), increased atmospheric levels of CO_2 are correlated with rising temperatures; concentrations of CO_2 have increased by 31 percent above pre-industrial levels since 1750 (Figure 3.3-1). Climate models show that temperatures will probably increase by 1.4 degrees Celsius (°C) to 5.8°C by 2100 (IPCC 2007).

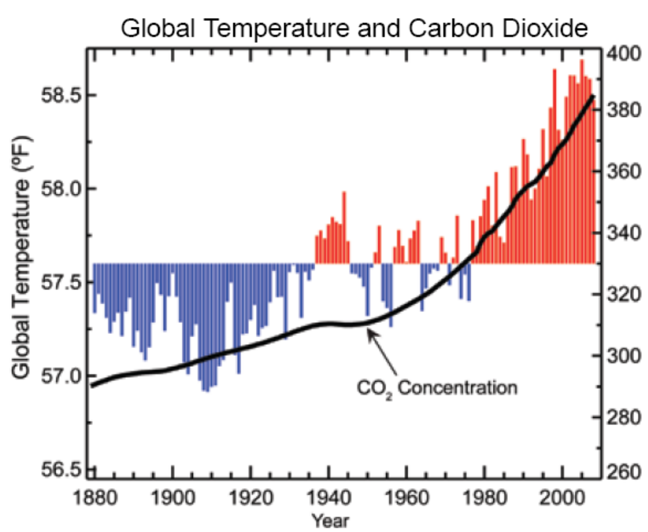

Figure 3.3-1 Relationship between Global Temperature and Carbon Dioxide
Source: IPCC 2001

Global warming potential (GWP) estimates how much a given mass of a GHG contributes to climate change. The term enables comparison of the warming effects of different gases. GWP uses a relative scale that compares the warming effect of the gas in question with that of the same mass of CO_2. The CO_2 equivalent (CO_2e) is a measure used to compare the effect of emissions of various GHGs based on their GWP, when projected over a specified time period (generally 100 years). CO_2e is commonly expressed as million metric tons (MMT) of CO_2 equivalents ($MMTCO_2e$). The CO_2e for a gas is obtained by multiplying the mass of the gas (in tons) by its GWP.

<u>Climate Change impacts - State of California and Southwestern US</u>

In AB 32, the legislature recognized California's particular vulnerability to the effects of global warming, finding that global warming will "have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry" (Health and Safety Code [H&SC] Section 38501, subd. (b)). Since the project area is among the parts of the state that experience hot weather, this area is at a greater likelihood of suffering from any electricity shortages caused by the strains of global warming. It may also feel the economic and public health damages from changes in vegetation and crop patterns, lower summer reservoirs, and increased air pollution that a changed climate will bring (CARB 2009). MDAQMD has not published any area-specific impacts, but it can be expected that the area would experience conditions similar to those projected in the Southwestern U.S.

If global warming emissions continue unabated, California is expected to face poorer air quality, a sharp rise in extreme heat, a less reliable water supply, more dangerous wildfires, and expanding risks to agriculture. Statewide annual temperatures are expected to increase by as much as 10°F by the end of the century. As temperatures rise, electricity demand will also increase. Diminished snow melt flowing through dams, potentially exacerbated by decreasing precipitation, would decrease the potential for hydropower production in California.

Under the expected scenarios for current projections of GHG emissions level impacts, it can be expected that the most germane regional impacts discussed above would be an increased risk of wildfires, higher local seasonal temperatures, and an increase in seasonal flash flooding.

3.3.2 Applicable Laws, Regulations, and Standards

Ambient air quality and air pollutant emissions from stationary and mobile sources are managed under a framework of federal, state, and local rules and regulations.

3.3.2.1 Federal

The CAA establishes the U.S. EPA's responsibilities to protect and improve the nation's air quality. The U.S. EPA oversees the implementation of federal programs for permitting new and modified stationary sources, controlling toxic air contaminants, and reducing emissions from motor vehicles and other mobile sources. The U.S. EPA also requires that each state prepare and submit a State Implementation Plan (SIP) for review. The SIP consists of background information, rules, technical documentation, and agreements that an individual state will use to clean up polluted areas. The plans and rules associated with them are enforced by the state and local agencies, but are also federally enforceable.

At this time, there are no finalized federal laws, regulations, or standards governing GHG emissions at the federal level in the U.S.

General Conformity

The General Conformity Rule has been promulgated by the U.S. EPA to ensure that the actions of federal departments or agencies conform to the applicable SIP. The General Conformity Rule covers direct and indirect emissions of criteria pollutants or their precursors that are caused by a federal action, are reasonably foreseeable, and can practically be controlled by the federal agency through its continuing program responsibility. A federal action is exempt from the General Conformity Rule requirements if the action's total net emissions are below the *e ini is* levels specified in the rule and are not regionally significant. An analysis of the project indicates that net direct and indirect emissions associated with project construction and operation would be less than the thresholds that would trigger the need for a General Conformity Determination under this rule.

3.3.2.2 State

California

The California Clean Air Act outlines a statewide air pollution control program in California. CARB is the primary administrator of the California Clean Air Act, while local air quality districts administer air rules and regulations at the regional level. CARB is responsible for establishing CAAQS, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and preparing the SIP. CARB uses air quality management plans prepared by local air quality districts as the basis of SIP development. CARB has adopted regulations to reduce the emissions from diesel exhaust for on-road vehicles and off-road equipment.

GHG Regulations

Until recently, climate change was not considered an environmental impact under CEQA, and GHG emissions associated with projects were not quantified, disclosed, or mitigated. Over the last five years, however, multiple legislative actions have occurred.

On June 1, 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05, establishing statewide GHG emission reduction targets of 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. On September 27, 2006, Governor Schwarzenegger signed the Global Warming Solutions Act, AB 32, which capped the state's GHG emissions at 1990 levels by 2020. This was the first statewide program in the country to mandate an economy-wide emissions cap that included enforceable penalties.

Based on its 1990–2004 inventory of GHG emissions in California, CARB staff recommended an amount of 427 $MMTCO_2e$ as the total statewide GHG 1990 emissions level and 2020 emissions limit. CARB approved the 2020 limit on December 6, 2007. This limit is an aggregated statewide limit, rather than sector- or facility-specific. CARB estimated emissions levels as approximately 480 $MMTCO_2e$ in year 2007. The 2020 reduction target is currently estimated to be 174 $MMTCO_2e$.

In 2007, the California Senate passed Senate Bill (SB) 97, requiring the Governor's Office of Planning and Research (OPR) to develop draft CEQA guidelines for the mitigation of GHG emissions and the effects of GHG emissions. In response to SB 97, the OPR proposed amendments to the CEQA guidelines in April 2009 that would provide guidance to California public agencies for analyzing and mitigating the effects of GHGs. In particular, the amendments proposed two new questions related to GHG impacts to the CEQA guidelines Appendix G Checklist, as well as additional questions on deforestation, energy conservation, and traffic impacts related to increased vehicle trips.

The Climate Change Scoping Plan, approved by the CARB on December 12, 2008, to fulfill Section 38561 of AB 32, is the state's roadmap to reach GHG reduction goals. The measures in the Scoping Plan will be in effect by 2012. Developed by CARB in conjunction with the CAT, the plan outlines a number of key strategies to reduce GHG emissions by approximately 42 MMTCO_2e by 2020 (about 25% of the estimated reductions needed by 2020). Due to expected growth in population and energy use, the emissions reduction target is approximately 30 percent below business as usual by the year 2020. The recommended early action measures include encouraging a low carbon fuel standard, landfill methane capture, reductions from mobile air conditioning, semiconductor reductions, SF_6 reductions, reductions of high GWP consumer products, a heavy-duty vehicles measure, a tire pressure program, and others.

On March 18, 2010, the CEQA guidelines mentioned above were amended to include a requirement for the quantification and mitigation of GHG emissions.

Some of the most important sections of the amendments are:

- Section 15064: The amendments require a lead agency make a "good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." The agency may use a quantitative or qualitative analysis. (§ 15064.4(a).) This is a change from the originally proposed amendments, which omitted the reference to "scientific or factual data." The guidelines provide a list of factors to be considered in assessing the significance of the impact from GHG emissions, including increases or reductions in GHG caused by the project, the applicable thresholds, and the project's compliance with local, regional, or statewide GHG reduction plans (§ 15064.4(b)).
- Section 15093: The statement of overriding considerations may consider the region-wide or statewide environmental benefits.
- Section 15125: An EIR must discuss any inconsistencies between the proposed project and regional blueprint plans and plans for GHG emission reduction.
- Section 15126.4: Mitigation measures may include measures in an existing plan or mitigation program, implementation of project features, offsite measures including offsets, or GHG sequestration. Mitigation in a plan may include project-specific mitigation.
- Section 15183: Projects may tier from programmatic-level GHG emissions analysis and mitigation. Section 15183 details what a GHG Emission Reduction Plan should contain. A later project may use the plan for its cumulative impacts analysis.
- Appendix G: "GHG" was added to the list of categories. Transportation and Traffic was modified to expand congestion analysis beyond level of service and remove reference to parking.

Nevada

The Nevada Department of Environmental Protection (NDEP) is the primary administrator of air quality rules and regulations at the state level. Thus, the NDEP is responsible for preparing and submitting the SIP to the U.S. EPA. However, air quality administration in Clark and Washoe counties has been delegated to the local county government and air districts. NDEP uses air quality management plans prepared by these county air quality districts during SIP development.

3.3.2.3 Local

Mojave Desert Air Basin (Desert Portion of San Bernardino County, California)

The Mojave Desert Air Quality Management District (MDAQMD) is the administrator of air pollution rules and regulations within the portion of the Mojave Desert Air Basin that includes the desert portion of San Bernardino County and the far eastern end of Riverside County. The MDAQMD is also responsible for issuing stationary source air permits, developing emissions inventories and local air quality plans, maintaining air quality monitoring stations, and reviewing air quality environmental documents required by CEQA.

Fugitive Dust Control

MDAQMD Rule 403.2 outlines fugitive dust control requirements applicable for the Mojave Desert Planning Area. The dust control requirements include:

- Using periodic watering for short-term stabilization of disturbed surface areas
- Performing reasonable precautions to prevent trackout onto paved surfaces
- Covering loaded haul vehicles while operating on publicly maintained paved surfaces
- Stabilizing site surfaces upon completion of grading
- Cleaning up trackout or spills on publicly maintained paved surfaces within 24 hours
- Reducing non-essential earth-moving activity under high wind conditions.

Additionally, the following requirements are applicable to construction/demolition sources disturbing 100 or more acres:

- Preparing and submitting to MDAQMD, prior to commencing earth-moving activity, a dust control plan that describes all applicable dust control measures that will be implemented at the project
- Preparing and submitting to MDAQMD stabilized access route(s)
- Maintaining natural topography to the extent possible
- Constructing parking lots and paved roads, where feasible
- Constructing upwind portions of project first, where feasible

Clark County, Nevada

The Clark County Department of Air Quality and Environmental Management (CC-DAQEM) is the administrator of air pollution rules and regulations within Clark County, Nevada. The CC-DAQEM is also responsible for issuing stationary source air permits, developing emissions inventories and local air quality plans, and maintaining air quality monitoring stations.

Fugitive Dust Control

Clark County Rule Section 94 outlines permitting and dust control for construction activities. Under this rule, a dust control permit is required from the CC-DAQEM prior to the start of large construction projects. A dust mitigation plan is required as part of the application for a dust permit.

3.3.3 Impact Analysis

This section defines the methodology used to evaluate impacts for air quality and GHGs, including CEQA impact criteria. The definitions are followed by an analysis of each alternative, including a joint CEQA/NEPA analysis of impacts. At the conclusion of the discussion is a NEPA impact summary statement and CEQA impact determinations. For mitigation measures, refer to Section 3.3.4.

3.3.3.1 NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects to air quality would result from the project, and explains the significance of those effects in the project area (40 CFR 1502.16). Significance is defined by Council on Environmental Quality regulations and requires consideration of the context and intensity of the change that would be introduced by the project (40 CFR 1508.27). Impacts are to be discussed in proportion to their significance (40 CFR 1502.2[b]). To facilitate comparison of alternatives, the significance of environmental changes is described in terms of the temporal scale, spatial extent, and intensity.

This document uses the following criteria to evaluate air quality impacts as part of the NEPA analysis:

a. conflict with or obstruct implementation of the applicable air quality plan;
b. violate any ambient air quality standard when added to the local background; increase the number or frequency of violations; contribute substantially to an existing or projected air quality violation; or
c. expose sensitive receptors to substantial pollutant concentrations.

3.3.3.2 CEQA Impact Criteria

Under CEQA, the proposed project would have a significant impact if it would:

a. conflict with or obstruct implementation of the applicable air quality plan;
b. violate any ambient air quality standard when added to the local background; increase the number or frequency of violations; contribute substantially to an existing or projected air quality violation;
c. result in a cumulatively considerable net increase of any criteria pollutant for which the proposed project region is nonattainment under an applicable ambient air quality standard;
d. expose sensitive receptors to substantial pollutant concentrations;
e. create objectionable odors affecting a substantial number of people;
f. generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;
g. conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

MDAQMD has adopted emission thresholds of significance for construction and operational emissions to help lead agencies analyze the significance of project-related emissions. These thresholds are shown in Table 3.3-3.

Table 3.3-3 MDAQMD Significant Emission Thresholds

Criteria Pollutant	**Annual Threshold** (tons)	**Daily Threshold** (lbs)
CO	100	548
NO_x	25	137
VOCs	25	137
SO_2	25	137
PM_{10}	15	82
$PM_{2.5}$	15	82
H_2S	10	54
Lead	0.6	3

Source: SCE 2009
Key:
CO = carbon monoxide
H_2S = hydrogen sulfide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PM_{10} = particulate matter with a diameter of 10 micrometers or less
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

The MDAQMD has not adopted any GHG significance threshold in response to AB 32. At this time, no mandatory GHG regulations or finalized agency CEQA thresholds of significance apply to this project. In the absence of an established CEQA threshold of significance, CARB's Mandatory GHG Reporting program may be used to determine whether or not a project's emissions of GHGs may be considered significant. With the passing of AB 32, CARB has been mandated to implement a regulatory program applicable to key sectors and facilities with significant combustion sources. CARB has set the facilities reporting threshold as 25,000 metric tons or more per year for most sources.

In October 2008, CARB presented a Preliminary Draft Staff Proposal with an example threshold of 7,000 $MTCO_2e$ per year for operational emissions (excluding transportation-related emissions) from industrial projects (CARB 2008). To date, CARB has not adopted this threshold or proposed alternative thresholds. In December 2008, the South Coast Air Quality Management District (SCAQMD) adopted an interim threshold of 10,000 $MTCO_2e$ per year (operational emissions plus construction emissions amortized over 30 years) for "industrial" projects for which the SCAQMD is the lead agency, and it is developing guidelines for projects for which other agencies are the lead.

To assess the significance of the proposed project's GHG emissions, the CPUC will apply the SCAQMD significance threshold of 10,000 $MTCO_2e$ per year, including all operational emissions and the construction emissions averaged over 30 years for this project. In the absence of a rulemaking to establish a GHG emission threshold of significance to be applied uniformly throughout the state, the CPUC is assessing the impacts of GHG emissions on a case-by-case basis. In areas of the state in which the local air pollution control district or air quality management district has not adopted a threshold of significance, the CPUC will consider applying a threshold that has been adopted by CARB or another air pollution control district or air quality management district. In this instance, the CPUC is using the SCAQMD threshold because CARB has yet to adopt a threshold, and the SCAQMD threshold was adopted after rigorous public vetting, and, at the time of writing, it is the only air district to adopt an emission-based threshold.

The SCAQMD developed its interim significance threshold for GHGs from stationary sources through a robust stakeholder working group process, which included staff from OPR, CARB, and the Office of the Attorney General. The working group provided input to staff at seven public meetings. The numerical threshold SCAQMD established is 10,000 $MTCO_2e$ per year, which corresponds to a threshold that captures 90 percent of stationary source GHG emissions. SCAQMD adopted the 90 percent emission capture rate as a reasonable cut-off point, based on staff estimates that the emissions from projects that will not exceed this threshold would account for slightly less than 1 percent of the future statewide GHG emissions target.

Use of the SCAQMD threshold is an appropriate tool in the CPUC's project-by-project analysis. After careful consideration, the CPUC finds that this threshold is appropriate for this project at this time. The following analysis describes the estimated emissions associated with the construction and operation of the proposed project and the significance of this impact.

3.3.3.3 Methodology

To assess the potential air quality impacts associated with the project according to the significance criteria discussed above, the potential air pollutant emissions from the construction phase and the operational phase (including maintenance activities) of the project were evaluated. As applicable, the project-related emissions were compared with appropriate significance thresholds. In addition, the proximity of emission sources to potential receptors was determined.

Emissions of criteria pollutants and GHGs were estimated using data on vehicle/equipment operation and published emission factors. For fugitive dust sources, $PM_{2.5}$ emissions were assumed to be equivalent to 10 percent of PM_{10} emissions. In addition, controlled fugitive emissions were assumed to be 50 percent of uncontrolled fugitive emissions based on the use of dust suppression required by local agencies (water truck for unpaved roads). Most emissions of GHGs were derived based on estimated equipment types and run-time, although additional estimates for worker commute and operational fugitive emissions of SF_6 were estimated based on applicant-provided information. See Appendix D for detailed air quality calculations.

3.3.3.4 Applicant Proposed Measures

The applicant has not proposed any measures related to air quality or air emission reduction for the proposed project beyond what is required by applicable regulations.

3.3.3.5 Proposed Project / Proposed Action

The project has the potential for air quality impacts during construction, ongoing operation, and maintenance of the proposed project components.

Construction

Air pollutant emissions would be generated during various activities associated with the project segments. Construction of the EITP would include removal of existing conductor, towers, foundations, and wood poles; installation of LST foundations; and assembly, hauling, and restoration activities. Construction at the Ivanpah Substation would involve grading, civil, and electrical phases. Installation of the telecommunications line would include tower work and line stringing. Air pollutant emissions would be generated during each construction phase from engine exhaust of onsite construction equipment and on-road vehicles. Onsite earthmoving activities and vehicle travel on local/access roads would generate fugitive dust.

Due to the linear nature of a transmission/telecommunications line, the numerous construction activities would occur at different locations spread out over the length of the proposed line. Thus, it is expected that construction equipment use would be spread out over a wide geographical area. The various construction activities could occur either simultaneously or at different times. The overall length of project construction is estimated at approximately 19 months. Depending on the project schedule, the level of construction activity is expected to be highly variable.

The estimated total criteria air pollutant emissions for all construction activities are presented in Table 3.3-4. A comparison of emissions expected in the MDAQMD (San Bernardino County, California) to the corresponding MDAQMD significance thresholds is presented in Table 3.3-5. Based on these estimates, the primary source of CO, NO_x, VOC, and SO_2 emissions would be non-road diesel construction equipment. It is assumed that most PM_{10} and $PM_{2.5}$ would be fugitive dust generated by vehicle traffic on unpaved roads. In general, construction emissions would be spread out over a wide geographic area.

The estimated average daily criteria pollutant emission rate for construction activities is presented in Table 3.3-6. This table also includes the daily MDAQMD significance thresholds. The average daily construction emission rates are based on the assumption that construction activities would occur concurrently and that equipment for each activity would be operating on the same day.

Effect on Implementation of Applicable Air Quality Plan

Construction activities related to the project would not conflict with or obstruct implementation of California or Nevada SIPs. These plans outline the long-term strategies for regional air quality compliance with NAAQS and state/local ambient air quality standards. The state emission inventories, as part of the SIPs, include fugitive dust and emissions from off-road equipment such as construction equipment. The emissions associated with project construction would be temporary and would be only a very small fraction of the regional emissions. No long-term effects associated with operation and maintenance of the proposed project would occur because periodic inspections would be the only activities that would generate emissions, and the emissions would be negligible.

Table 3.3-4 Total Project Construction Emissions

Location	Construction Activity	Total Emissions (tons)					
		CO	NO_x	VOCs	SO_2	PM_{10}	$PM_{2.5}$
San Bernardino County, California (MDAQMD)	Existing 115-kV Line Removal	0.28	0.44	0.06	0.0006	2.6	0.56
	Ivanpah Substation Construction	3.8	10	1.1	0.01	4.0	1.0
	220-kV Eldorado–Ivanpah Transmission Line Installation	4.5	8.1	0.96	0.04	8.0	1.9
	33-kV Distribution Line Installation	0.05	0.10	0.01	0.0001	0.11	0.02
	Telecommunication Line Installation	0.32	0.61	0.07	0.0009	0.95	0.21
	Total	**9.0**	**19**	**2.2**	**0.05**	**16**	**3.7**
	rst nth Per						
	ec n nth Per						
Clark County, Nevada	220-kV Eldorado-Ivanpah Transmission Line Installation	18	32	3.8	0.16	32	7.8
	Telecommunication Line Installation	1.3	2.4	0.28	0.004	3.8	0.83
	Replacement of Overhead Ground Wire on Eldorado–Lugo 500-kV Line	2.5	4.3	0.51	0.05	4.7	1.1
	Total	**22**	**39**	**4.6**	**0.22**	**41**	**10**
	rst nth Per						
	ec n nth Per						
Total Project Area[a]	Ivanpah Substation Construction	3.8	10	1.1	0.01	4.0	1.0
	220-kV Eldorado–Ivanpah Transmission Line Installation	22	40	4.8	0.20	40	9.7
	Existing 115-kV Line Removal	0.28	0.44	0.06	0.001	2.6	0.56
	33-kV Distribution Line Installation	0.05	0.10	0.01	0.0001	0.11	0.02
	Telecommunication Line Installation	1.6	3.0	0.36	0.004	4.7	1.0
	Replacement of Overhead Ground Wire on Eldorado–Lugo 500-kV Line	2.5	4.3	0.51	0.05	4.7	1.1
	Total	**31**	**58**	**6.8**	**0.27**	**56**	**13**
	rst nth Per						
	ec n nth Per						

Notes:
[a]Includes location of all projects in San Bernardino County, California, and Clark County, Nevada.
[b]Approximately 9 months of construction is anticipated for second 12-month period.

Key:
CO = carbon monoxide
kV = kilovolt
MDAQMD = Mojave Desert Air Quality Management District
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PM_{10} = particulate matter with a diameter of 10 micrometers or less
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Table 3.3-5 Comparison of Annual Project Emissions in San Bernardino County, California, to MDAQMD Significance Thresholds

Air Pollutant	Annual Project Emissions in San Bernardino County, California (MDAQMD) (tons/yr)		MDAQMD Annual Emission Significance Threshold (tons/yr)
	First 12-Month Period	Second 12-Month Period[a]	
CO	5.5	3.2	100
NO_x	12	7.0	25
VOCs	1.4	0.8	25
SO_2	0.03	0.02	25
PM_{10}	10	5.8	15
$PM_{2.5}$	2.4	1.4	15

Note:
[a]Approximately 9 months of construction is anticipated for second 12-month period.

Key:
CO = carbon monoxide
MDAQMD = Mojave Desert Air Quality Management District
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PM_{10} = particulate matter with a diameter of 10 micrometers or less
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Table 3.3-6 Daily Project Construction Emissions

Location	Construction Activity	Average Daily Emissions[a] (lbs/day)					
		CO	NO_x	VOCs	SO_2	PM_{10}	$PM_{2.5}$
San Bernardino County, California (MDAQMD)	Existing 115-kV Line Removal	17	26	3.3	0.04	153	33
	Ivanpah Substation Construction	47	122	14	0.1	50	13
	220-kV Eldorado–Ivanpah Transmission Line Installation	77	138	16	0.7	137	33
	33-kV Distribution Line Installation	12	25	3	0.04	27	6
	Telecommunication Line Installation	11	20	2	0.03	34	9
	o bine Total						
	A a ly ss n gn cance hresh l s						

Table 3.3-6 Daily Project Construction Emissions

Location	Construction Activity	Average Daily Emissions[a] (lbs/day)					
		CO	NO_x	VOCs	SO_2	PM_{10}	$PM_{2.5}$
Clark County, Nevada	220-kV Eldorado–Ivanpah Transmission Line Installation	77	138	16	0.7	137	33
	Telecommunication Line Installation	11	20	2	0.03	34	9
	Replacement of Wire on Eldorado–Lugo 500-kV Line	25	43	5	0.5	47	11
	o bine Total						

Note:
[a]Based on the conservative assumption that all construction equipment operates concurrently.

Key:
CO = carbon monoxide
MDAQMD = Mojave Desert Air Quality Management District
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PM_{10} = particulate matter with a diameter of 10 micrometers or less
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Temporary Ambient Air Quality Impacts Caused by Construction Activities

Emissions generated from construction activities are anticipated to cause temporary increases in ambient air pollutant concentrations along the route of construction activities and the access roads used by project vehicles. Since the construction activities would be transient and would impact specific locations for only limited durations, long-term impacts would not occur. Further, the majority of the proposed construction would be carried out in isolated areas of the desert that are not close to populated areas. As stated earlier, construction activity would also not be concentrated in a single location but spread out over a wide geographic area. However, although the applicant would implement mitigation measures (MM AIR-1, use of low-emission equipment, and MM AIR-2, enhanced fugitive dust controls to reduce emissions), short-term impacts to ambient air quality could still occur.

Temporary Emission Increases of NO_x, VOCs, and PM_{10} during Construction

Project construction would occur in an area designated nonattainment for ozone and PM_{10}. The estimates of average daily emissions of PM_{10} and NO_x from project construction activities exceed MDAQMD daily significance thresholds (see Table 3.3-6). Comparison of average daily emissions to significance thresholds was based on the conservative assumption of daily equipment use. However, construction activities would be transient and would impact specific locations for only limited durations; therefore, long-term impacts would not occur. Mitigation measures would be implemented (MM AIR-1, use of low-emission equipment, and MM AIR-2, enhanced fugitive dust controls) to reduce short-term impacts. However, these mitigation measures are not expected to reduce PM_{10} and NO_x emissions from construction activities to below MDAQMD daily significance thresholds.

Temporarily Expose Sensitive Receptors to Increased Pollutant Concentrations

Diesel particulate emissions would be part of the exhaust from project construction equipment and on-road vehicles. The only receptor identified as being close to the proposed project construction area is the Desert Oasis Apartment Complex, which could be exposed to short-term increased pollutant concentrations. The project would not be near schools, day care centers, hospitals, or other sensitive receptors. Given that construction activities would be transient and would impact specific locations for only limited durations, long-term impacts would not occur.

Temporarily Cause Odors Due to Fuel Combustion

Exhaust from construction equipment might temporarily create odors from the combustion of fuel. However, the level of emissions would likely not cause a perceptible odor to a substantial number of people. Any odors that were perceptible would be temporary during construction activities. Vehicle emissions during project operation would be minimal, so no objectionable odors are expected.

Generate GHG Emissions

The estimated total GHG emissions from all construction activities is approximately 7,000 $MTCO_2e$. Amortized over 30 years, the annual GHG emissions from construction would be approximately 232 MTCO2e per year (see Table 3.3-7).

Table 3.3-7 Summary of GHG Emissions from Construction and Operation

Greenhouse Gas	**Annual Direct Emissions** (metric tons)		**Global Warming Potential**	**Annual Carbon Equivalent Emissions** ($MTCO_2e$)	
	Construction	**Operation[a,b]**		**Construction**	**Operation**
CO_2	6,950	18	1	6,950	18
SF_6	–	0.0073	23,900	–	176
			~~sub~~Total	**6,950**	**194**
Annual ~~Total~~ Project GHG Emissions Construction (6,950 $MTCO_2e$ amortized over 30 years) Operation **TOTAL~~, Max Yearly~~**				232 $MTCO_2e$/yr 194 $MTCO_2e$/yr **426 $MTCO_2e$/yr ~~7,144~~**	
CPUC-Applied SCAQMD Threshold for Annual GHG Emissions				**10,000 $MTCO_2e$/yr**	
Emissions do not exceed threshold **LESS THAN SIGNIFICANT IMPACT**					

Notes:
[a]Direct emissions of CO_2 estimated based on 100 vehicle miles traveled per day and 1.1 lbs CO_2/mile.
[b]Direct emissions of SF_6 estimated by assuming 1% leak rate from equipment storing 1,620 lbs of SF_6, which would equal 16.2 lbs/year.

Key:
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
SF_6 = sulfur hexafluoride

Operation & Maintenance

The emissions of criteria air pollutants during project operation would be primarily from maintenance vehicles used by workers to patrol the transmission lines and visit the substation. These operational/maintenance emissions would be negligible. It is assumed that most of the GHG emissions during project operation would result from potential leaks of SF_6 from substation/transmission equipment. Annual GHG emissions from the operational activities are estimated at approximately 190 $MTCO_2e$ (Table 3.3-7).

NEPA Summary

Construction activities related to the project would not conflict with or obstruct implementation of California or Nevada SIPs. The emissions associated with project construction would be temporary and would be only a very small fraction of the regional emissions. No long-term impacts associated with operation and maintenance would occur. Therefore, the proposed project would have a negligible effect on the implementation of an applicable air quality plan.

Emissions generated from construction activities would temporarily increase ambient air pollutant concentrations along the route of the transmission line and in the vicinity of access roads used by project vehicles. Construction emissions of $PM_{2.5}$, PM_{10}, and NO_X would temporarily exceed MDAQMD daily significant thresholds, even with the implementation of use of low-emission equipment (MM AIR-1) and enhanced fugitive dust controls (MM AIR-2). This would result in short-term, moderate impacts on ambient air quality.

Diesel particulate emissions would be part of the exhaust from project construction equipment and on-road vehicles. As discussed above, the Desert Oasis Apartment Complex is the only receptor, but the potential exposure of this receptor to emissions would be short term (approximately 2.5 weeks during construction). Therefore, the short-term exposure of sensitive receptors to increased pollutant concentrations from the proposed project would be minor.

Air pollutant emissions and resulting impacts during operation of the proposed project would be negligible.

CEQA Significance Determinations

IMPACT AIR-1: **Conflict or Obstruct the Implementation of Applicable Air Quality Plan**
ess than signifi ant

Construction activities related to the project would not conflict with or obstruct implementation of the Mojave Desert Planning Area Air Quality Attainment Plan. The emissions associated with project construction would be temporary and would be a small fraction of the regional emission inventory included in the plan. No long-term impacts associated with operation and maintenance are anticipated for the proposed project. Therefore, the proposed project would have a less than significant impact on implementation of applicable air quality plans.

IMPACT AIR-2: **Temporary Ambient Air Quality Impacts Caused by Construction Activities Would Violate or Contribute Substantially to an Air Quality Violation**
~~otentially s~~_ignifi ant

The estimated average daily emissions of $PM_{2.5}$, PM_{10}, and NO_X from project construction activities would exceed MDAQMD daily significance thresholds (see Table 3.3-6). The comparison of average daily emissions to significance thresholds was based on conservative assumptions about daily equipment use. The large majority of $PM_{2.5}$ and PM_{10} emissions are due to fugitive dust generated from onsite construction and vehicle travel on roads. Implementation of MM AIR-1, the use of low-emission equipment, and MM AIR-2, enhanced fugitive dust controls, would reduce potential impacts, but would not likely reduce emissions from construction activities to below the MDAQMD daily significance ~~significant~~ thresholds. Impacts would be limited to the duration of project construction; long-term and operational impacts would not occur. As average daily emissions of $PM_{2.5}$, PM_{10}, and NO_X are projected to exceed established thresholds, associated impacts ~~could~~ would be ~~potentially~~ significant during construction.

IMPACT AIR-3: **Temporary Emission Increases of NO_x and PM_{10} during Construction Would Contribute to a Cumulatively Considerable Net Increase of a Criteria Pollutant in a Nonattainment Area**
~~otentially s~~_ignifi ant

Project construction would occur in an area designated nonattainment for ozone and PM_{10}. The estimates of average daily emissions of PM_{10} and NO_X from project construction activities exceed MDAQMD daily significance ~~significant~~ thresholds (see Table 3.3-6). The comparison of average daily emissions to significance thresholds was based on conservative assumptions about daily equipment use. The large majority of $PM_{2.5}$ and PM_{10} emissions are due to fugitive dust generated from onsite construction and vehicle travel on roads.

Mitigation measures MM AIR-1, the use of low-emission equipment, and MM AIR-2, enhanced fugitive dust controls, would be implemented to reduce potential impacts, but these mitigation measures would not likely reduce PM_{10} and NO_X emissions from construction activities to below the MDAQMD daily significant thresholds; therefore, the impact of temporary emissions from construction ~~is potentially~~ would be significant.

IMPACT AIR-4: Temporarily Expose Sensitive Receptors to Substantial Pollutant Concentrations
ess than signifi ant

Diesel particulate emissions would be generated during project construction. The only receptor identified as being close to the proposed project construction area is the Desert Oasis Apartment Complex, where residents could be exposed to short-term increased pollutant concentrations. The project would not be located near schools, day care centers, hospitals, or other sensitive receptors. Given that construction activities would be transient and would impact specific locations for only limited durations, the impact of increased pollutant concentrations on sensitive receptors would be less than significant.

IMPACT AIR-5: Temporarily Create Objectionable Odors Due to Fuel Combustion that would Affect a Substantial Number of People
ess than signifi ant

Odors created during construction from the combustion of fuel would likely not cause a perceptible odor to a substantial number of people. If perceptible, such impacts would be temporary and would be limited to the duration of the project construction period. Vehicle emissions during project operation would be minimal, so no objectionable odors are expected. Therefore, impacts associated with increased odors due to fuel combustion would be less than significant.

IMPACT AIR-6: Generate GHG Emissions That May Have a Significant Impact on the Environment
ess than signifi ant

The project would cause an increase in GHG emissions. However, the amount of emissions from both project construction (estimated at 6,950 $MTCO_2e$) and operation (estimated at 194 $MTCO_2e$ per year) would be insignificant. Neither the state of California, nor the applicable air districts has officially adopted a GHG threshold of significance for CEQA. The purpose of establishing a threshold is to provide some guidance for determining if a project will have a significant impact on the environment. CPUC, as the lead agency, has the responsibility to assess the level at which the effects of the project would be significant. In order to use a conservative methodology, CPUC has elected to apply a significance threshold of 10,000 metric tonnes CO_2e per year~~, which corresponds to the lowest officially adopted GHG threshold in the state of California~~ (from SC-AQMD's Draft Guidance Document – Interim CEQA GHG Significance Threshold). As with other individual small projects (e.g., projects that emit less than 25,000 $MTCO_2e$ per year), the GHG emissions increases that would result under the project would not be expected to individually have a significant impact on global climate change. Therefore, the impact of the generation of GHG emissions would be less than significant.

Even though the generation of GHG emissions from the proposed project would be less than significant, the applicant would be required to follow and/or consider best management practices to reduce the potential for GHG emissions (see Mitigation Measure MM-AIR-3).

NO IMPACT. Conflict With Any Applicant Plan, Policy, or Regulation Aimed at Reduction of Greenhouse Gases. At this time, no mandatory GHG regulations or finalized agency guidelines apply to this project. In the absence of established state regulations addressing mitigation of impacts related to GHG emissions, OPR has issued guidance encouraging agencies to develop a regional approach (OPR 2009). MDAQMD has not issued any finalized guidance for GHG reporting or set any thresholds for CEQA analysis of GHG emissions. As there are no applicable regional policies or plans that address this type of project, the project does not conflict with any identified plans, policies, or regulations.

3.3.3.6 No Project / No Action Alternative

Under the No Project Alternative, the new double circuit transmission line would not be constructed. Thus, there would be no construction or operational emissions or air quality impacts.

3.3.3.7 Transmission Alternative Route A

Transmission Alternative Route A would vary from the proposed project route near the Eldorado Substation. The remainder of the EITP would be the same. The level of construction and operational activity for the entire route using Transmission Alternative Route A is expected to be similar to that of the proposed project route. Thus, the air quality and GHG impacts associated with this alternative would be similar to those discussed above for the proposed project.

Transmission Alternative Route A would have a negligible effect on the implementation of an applicable air quality plan. As with the proposed project, the total amount of the emissions generated during construction, even with implementation of emission equipment (MM AIR-1) and enhanced fugitive dust controls (MM AIR-2), would be sufficient to create short-term, moderate impacts to ambient air quality. The short-term exposure of sensitive receptors to increased pollutant concentrations from this alternative would be minor. The average daily emissions of $PM_{2.5}$, PM_{10}, and NO_X from construction activities would exceed MDAQMD daily significance thresholds; therefore, these short-term impacts would be potentially significant. The impact of increased pollutant concentrations on sensitive receptors would be less than significant. The impact of increased odors due to fuel combustion would be less than significant. The impact of the generation of GHG emissions would be less than significant. This alternative would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

3.3.3.8 Transmission Alternative Route B

Transmission Alternative Route B would vary the proposed project route near the Eldorado Substation. The remainder of the EITP would be the same. Although this alternative route is about 5.5 miles longer than the proposed route, the level of construction and operational activity associated with the entire route using Transmission Alternative Route B is expected to be similar to that of the proposed project route, as it would only impact an additional 24 acres. Assuming emissions impacts are in line with the additional length and area of impact, the emissions under this scenario could be approximately 5 percent above the emissions for the proposed project. Thus, the air quality and GHG impacts associated with this alternative would be similar to those associated with the project and discussed above for Transmission Alternative Route A.

3.3.3.9 Transmission Alternative Route C

Transmission Alternative Route C is a route variation near Primm. The remainder of the EITP would be the same. Although this alternative route is longer than the proposed route, the level of construction and operational activity associated with the entire route using Transmission Alternative Route C is expected to be similar to that of the proposed project route as it would only impact an additional 5.5 acres. Assuming emissions impacts are in line with the additional length and area of impact, the emissions under this scenario could be approximately 5 percent above the emissions of the proposed project. Thus, the air quality and GHG impacts associated with this alternative would be similar to those associated with the project and discussed above for Transmission Alternative Routes A and B.

3.3.3.10 Transmission Alternative Route D and Subalternative E

Transmission Alternative Route D and Subalternative E are route variations near Primm. The remainder of the EITP would be the same. The level of construction and operational activity associated with the entire route using Transmission Alternative Route D and Subalternative E is expected to be similar to that of the proposed project route.

Thus, the air quality and GHG impacts associated with this alternative would be similar to those associated with the project and discussed for Transmission Alternative Routes A, B, and C above.

3.3.3.11 Telecommunication Alternative (Golf Course)

This alternative would deviate from the proposed project telecommunication route outside the town of Nipton, California. This alternative would not require the proposed microwave tower. The telecommunications line would continue along the north side of Nipton Road in a new underground duct for approximately 10 miles. The telecommunications line would then be underbuilt on existing distribution lines for approximately 10 miles to the proposed Ivanpah Section with the exception of a segment that would be installed in a new underground duct beneath the Primm Valley Golf Course.

The level of construction and operational activity associated with this alternative telecommunications route are expected to be similar to that of the proposed project route. Thus, the air quality and GHG impacts associated with this alternative would be similar to those associated with the project and discussed above for Transmission Alternative Routes A, B, C, and D and Subalternative E.

3.3.3.12 Telecommunication Alternative (Mountain Pass)

This alternative would deviate from the proposed project telecommunication route outside the town of Nipton, California. This alternative would not require the proposed microwave tower. The telecommunications line would continue along the north side of Nipton Road in a new underground duct for approximately 10 miles. The telecommunications line would then be underbuilt on existing distribution lines for approximately 15 miles to the west of the town of Mountain Pass and north of the existing Mountain Pass Substation to the proposed Ivanpah Substation.

The level of construction and operational activity associated with this alternative telecommunications route are expected to be similar to that of the proposed project route. Thus, the air quality and GHG impacts associated with this alternative would be similar to those associated with the project and discussed for Transmission Alternative Routes A, B, C, and D, Subalternative E, and the Golf Course Telecommunication Alternative.

3.3.4 Mitigation Measures

The following mitigation measures are proposed to reduce the air quality impacts associated with the proposed project:

MM AIR-1: Low-emission Construction Equipment. All construction equipment with a rating between 100 and 750 horsepower (hp) will be required to use engines compliant with U.S. EPA Tier 2 non-road engine standards. In addition, all off-road and portable construction diesel engines not registered under the CARB Statewide Portable Equipment Registration Program that have a rating of 50 hp or more will meet, at a minimum, the Tier 2 California non-road engine standards unless that engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine will be equipped with a Tier 1 engine. The applicant will substitute small electric-powered equipment for diesel- and gasoline-powered construction equipment where feasible. The applicant will maintain construction equipment according to manufacturing specifications and use low-emission equipment.

MM AIR-2: Enhanced Dust Control Measures. In addition to the dust control requirements by MDAQMD and CC-DAQEM, the following measures will be implemented for mitigation:

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area

- Pre-watering of soils prior to clearing and trenching
- Pre-moistening of, prior to transport, import and export dirt, sand, or loose materials
- Dedication of water truck or high-capacity hose to any soil screening operations
- Minimization of drop height of material through screening equipment
- Reduction of the amount of disturbed area where possible
- Planting of vegetative ground cover in disturbed areas ~~within 21 days~~ after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan as described in MM BIO-2.

MM AIR-3: Best Management Practices for GHG Reduction. The applicant would be required to enforce and follow limits for idling time for commercial vehicles, including delivery and construction vehicles. The applicant would be also be required to consider the following best management practices to reduce the potential for GHG emissions:

- Joining U.S. EPA's SF_6 Emission Reduction Partnership for Electric Power Systems (http://www.epa.gov/highgwp/electricpower-sf6/basic.html);
- Performing annual inspections and estimation of SF_6 emissions using an emission inventory protocol;
- For equipment that would contain SF_6, purchasing only new equipment that meets International Council on Large Electric Systems (CIGRE) standards for leak rates;
- Implementing SF_6 recovery and recycling;
- Ensuring that only knowledgeable personnel handle SF_6; and
- Providing a vanpool for construction workers.

3.3.5 Whole of the Action / Cumulative Action

Below is a brief summary of information related to air quality and GHGs in the BLM's ISEGS Final Environmental Impact Statement (FEIS) and the California Energy Commission's (CEC's) Final Staff Assessment (FSA) and Addendum. This section focuses on differences in the ISEGS setting and methodology compared with the setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the BLM and CEC for ISEGS.

3.3.5.1 ISEGS Setting

Since the ISEGS project is located in the Southern California Mojave Desert close to the California-Nevada border, the environmental setting is very similar to that of the EITP. The area is located within the MDAB, and is designated as moderate non-attainment for the state ozone standard, and the state and federal PM_{10} standards. The area is classified as being in attainment for the federal ozone standard, and as unclassified and/or attainment for state and federal CO, lead, NO_2, and $PM_{2.5}$, SO_2 standards.

Applicable Laws, Regulations, and Standards

Due to the variation in project components and location between EITP and ISEGS, there would be differences in the laws, regulations, and standards that would apply to ISEGS compared to those listed above for EITP (see Table 3.3-8). Since ISEGS would be developed entirely within California on BLM land, the Nevada regulations associated with the EITP would not apply. ISEGS project components and operational features would also trigger additional laws, regulations, and standards. The regulatory authority responsible for air quality is the MDAQMD. Table 3.3-8 provides an overview of the laws, regulations, and standards applicable to the ISEGS project.

Table 3.3-8 Laws, Regulations, and Standards Applicable to the ISEGS Project

Law, Regulation, or Standard	Description	Project Component
Federal		
40 CFR Part 52	Nonattainment NSR requires a permit, BACT, and offsets. Permitting and enforcement is delegated to MDAQMD. PSD requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The ISEGS project is a new source that has a rule-listed emission source; thus, the PSD trigger levels are 100 tons per year for NO_X, VOCs, SO_2, $PM_{2.5}$, and CO. The ISEGS project's proposed emissions are below NSR and PSD applicability thresholds.	Operations
40 CFR Part 60	NSPS, Subpart D, Standards of Performance for Electricity Steam Generation Units. Establishes emission standards and monitoring/recordkeeping requirements for units with greater than 250 MM BTU/hr heat input. Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for these engines, which include emergency fire water pump engines.	Operations
State		
HSC Section 40910-40930	Permitting of source needs to be consistent with CARB-approved Clean Air Plans.	Operations
HSC Section 41700	Restricts emissions that would cause nuisance or injury.	Operations
CCR Section 93115	Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the types of fuels allowed, establishes maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines including emergency fire water pump engines.	Operations
Local		
Rule 404 Particulate Matter – Concentration	Limits the particulate matter concentration from stationary source exhausts.	Operations
Rule 900 Standard of Performance for New Stationary Source	Incorporates the Federal NSPS (40 CFR 60) rules by reference.	Operations
Regulation XII – Federal Operating Permits	Requires that new or modified major facilities or facilities that trigger NSPS, Acid Rain or other federal air quality programs obtain a Title V federal operating permit.	Operations
Rule 1210 – Acid Rain	Requires that facilities subject to the federal Acid Rain program obtain permits and comply with emissions and monitoring provisions.	Operations
Rule 1303 – New Source Review	Specifies BACT/offsets technology and requirements for any new emissions unit that has potential to emit any affected pollutants.	Operations
Rule 1306 – Electric Energy Generating Facilities	Describes actions to be taken for permitting of power plants that are within the jurisdiction of the California Energy Commission.	Operations

Key:
BACT = Best Available Control Technology
CARB = California Air Resource Board
CCR = California Code of Regulations
CFR = Code of Federal Regulations
CO = carbon monoxide
HSC = Health and Safety Code
MDAQMD = Mojave Desert Air Quality Management District
MM BTU/hr = 1 million British Thermal Units per hour
NO_X = nitrogen oxides

Table 3.3-8 Laws, Regulations, and Standards Applicable to the ISEGS Project

Law, Regulation, or Standard	Description	Project Component

NSPS = New Source Performance Standards
$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
VOC = volatile organic compound

3.3.5.2 ISEGS Methodology

CEC's FSA Methodology

The methodology for analyzing impacts for the ISEGS project was similar to that used for the EITP. CEC staff primarily used two CEQA significance criteria to evaluate the ISEGS project. First, all project emissions of nonattainment criteria pollutants and their precursors (NO_X, VOC, PM_{10}, and SO_2) were considered CEQA significant cumulative impacts that must be mitigated. Second, any AAQS violation or any contribution to any AAQS violation caused by any project emissions was considered CEQA significant and mitigation was required. BACT would be applied to both the onsite stationary and the non-stationary sources for the ISEGS project. For the NEPA analysis, the Prevention of Significant Deterioration (PSD) threshold was considered in addition to the NAAQS and general conformity considered above for EITP. Also, the emissions from the proposed project, both stationary source and onsite mobile source, were analyzed for ISEGS using air dispersion models to determine the probable impacts at ground level.

Furthermore, the impact of the GHG emissions from a power plant's operation should be analyzed in the context of applicable GHG laws and policies, such as AB 32. As this part of the CEC's Final Decision, the following was taken into consideration:

- Whether ISEGS GHG construction emissions will have significant impacts;
- Whether ISEGS operation will be consistent with the state's GHG policies and will help achieve the state's GHG goals by causing a decrease in overall electricity system GHG emissions.

BLM's FEIS Methodology

Under NEPA, the BLM's FEIS assessed the significance of ISEGS's impact on air quality and GHGs against NEPA-implementing regulations at 40 CFR 1508.27 (see Section 3.12.3.1). Specifically, the BLM's FEIS evaluated whether the ISEGS project would result in impacts related to the following:

BLM assessed three kinds of primary and secondary impacts: construction, operational, and cumulative. (Primary impacts potentially result from facility emissions of NOx, SOx, CO, and $PM_{10/2.5}$. Secondary impacts result from air contaminants that are not directly emitted by the facility but formed through reactions in the atmosphere that result in ozone, sulfate, nitrate, and PM_{10}/$PM_{2.5}$.) Construction impacts result from the emissions occurring during site preparation and construction of the project. Operational impacts result from the emissions of the proposed project during normal operation, which includes all of the onsite auxiliary equipment (boilers, cooling tower, fire pump engine, etc.) and the maintenance vehicle emissions.

The NEPA air quality analysis considers the following three regulatory thresholds:

- General Conformity applicability thresholds, which for this project is limited to 100 tons per year of PM_{10} and PM_{10} precursors (NOx and SOx). This regulatory threshold applies to both project construction and operation emissions.
- PSD permit applicability thresholds, which for this project as a listed major source category is 100 tons per year for the criteria pollutants. This regulatory threshold only applies to project operation and only applies to direct project emissions, and does not apply to secondary emissions, such as fugitive dust emissions.
- Project would cause air quality impacts in exceedance of the National Ambient Air Quality Standards (NAAQS).

If the project were to exceed either of the first two of these regulatory thresholds then there could be direct, adverse impacts which would require a further refined impact and mitigation analysis in order to demonstrate that no impacts would occur based on the potential to cause exceedances of the NAAQS.

While the emissions are the actual mass of pollutants emitted from the project, the impacts are the concentration of pollutants from the project that reach the ground level. When emissions are expelled at a high temperature and velocity through the relatively tall stack, the pollutants would be substantially diluted by the time they reach ground level. The emissions from the proposed project, both stationary source and onsite mobile source emissions, are analyzed through the use of air dispersion models to determine the probable impacts at ground level.

Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions to provide theoretical maximum offsite pollutant concentrations short-term (1-hour, 3-hour, 8-hour, and 24-hour) and annual periods. The model results are generally described as maximum concentrations, often described as a unit of mass per volume of air, such as µg/m3.

The applicant has used the EPA-approved ARMS/EPA Regulatory Model (AERMOD version 07026) air dispersion model to estimate the direct impacts of the project's NOx, PM_{10}, CO, and SOx emissions resulting from project construction and operation. Additionally, boiler emission fumigation impacts during inversion breakup conditions were determined using the EPA-approved SCREEN3 model.

BLM revised the background concentrations provided by the applicant, replacing them with the available highest ambient background concentrations for the last three years from representative monitoring sites. BLM added the modeled impacts to these background concentrations, then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the project's emission impacts would cause a new violation of the ambient air quality standards or would contribute to an existing violation.

The inputs for the air dispersion models include stack information (exhaust flow rate, temperature, and stack dimensions), specific boiler emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For this project, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at the Jean, Nevada, meteorological site during 2001 and 2002, which is the closest complete meteorological data source to the project site, and supplemented to fill missing data using the Nellis Air Force Base meteorological site. Concurrent upper air data from the Mercury Desert Rock Airport in Mercury, Nevada was also used.

Additionally, the applicant obtained hourly ozone and NO_2 ambient data from the Barstow monitoring station for 2001 and 2002 that was used in a more refined NO_2 impact modeling analysis using the Plume Volume Molar Ratio

Method (PVMRM), available with AERMOD that integrates the Ozone Limiting Method (OLM) with the downwind plume stoichiometry.

The impact of GHG emissions caused by this solar facility is characterized by considering how the power plant would affect the overall electricity system. The integrated electricity system depends on both non-fossil and fossil-fueled generation resources to provide energy and satisfy local capacity needs.

3.3.5.3 ISEGS Impacts

The CEC and BLM staff determined that construction, operation, and decommissioning of the ISEGS project could impact air quality and green house gas emissions. Where impacts were identified, the CEC and BLM staff proposed mitigation measures to reduce impacts to less than significant levels. The CEC and BLM have published the impacts discussed below related to air quality and green house gases for the ISEGS project.

CEC's FSA/DEIS / FSA Addendum / Final Decision Impact Conclusions

The CEC has published the following impacts related to air quality and green house gases for the ISEGS project in the FSA/DEIS, FSA Addendum, Final Decision, and Errata to FSA Addendum Air Quality Section. Section 3.12.5.4 contains the CEC- proposed Conditions of Certification mitigation measures for the ISEGS project.

Construction Impacts

The ISEGS Mitigated Ivanpah 3 would consist of three phases, with total construction duration of 40 months. Activities such as site preparation, construction, and installation of major equipment and structures would result in fugitive dust emissions and emissions from equipment exhausts. In addition, a small amount of hydrocarbon emissions may occur because of the temporary storage of petroleum fuel at the site. Air dispersion modeling was done to analyze the ground level impacts from all construction activities. Peak hourly, daily, and annual construction equipment exhaust and fugitive dust emissions were used to perform the modeling analysis. The modeled impacts from construction activities were added to the background concentrations to assess the impact from the project. The modeling results indicated that without adequate fugitive dust mitigation, the ISEGS Mitigated Ivanpah 3 project would have the potential to exceed the General Conformity PM_{10} applicability threshold during construction and operation, and could cause potential localized exceedances of the PM_{10} NAAQS during construction. Since the area is nonattainment for PM_{10}, mitigation measures AQ-SC1 through AQ-SC5 would be implemented to mitigate the potentially significant impacts. Mitigation measures AQ-SC1 through AQ-SC5 are described below in Section 3.3.5.4. The modeling analysis shows that, after implementation of the recommended fugitive dust mitigation measures, the project's construction would not cause violations of the ambient air quality standards. Therefore, no significant NEPA impacts would occur after implementation of the mitigation measures.

The construction activities from the ISEGS Mitigated Ivanpah 3 project would likely contribute to significant CEQA adverse PM_{10} and ozone impacts unless mitigation measures are implemented. Implementation of mitigation measures AQ-SC1 to AQ-SC5 would mitigate these potential impacts to less than significant.

To mitigate the impacts from the construction of the facility, the applicant has proposed to follow the mitigation measures from the SCAQMD CEQA guidelines. In addition to those, the FSA/DEIS indicated that the BLM and CEC have recommended the use of polymer based soil stabilizers, or equivalent, on the site's unpaved roads and inactive disturbed surfaces during construction.

The applicant provided a construction emissions estimate that CEC staff used to calculate greenhouse gas emissions for the entirety of the construction activities. The greenhouse gas emissions estimate for construction is approximately 17,779 $MTCO_2e$.

In order to limit vehicle emissions of both criteria pollutants and GHG during construction, ISEGS will use (1) operational measures, such as limiting vehicle idling time and shutting down equipment when not in use; (2) regular preventive maintenance to prevent emission increases due to vehicular engine problems; and (3) use of low-emitting diesel engines meeting federal emissions standards for construction equipment, whenever available. Control measures stated in the Final Decision to address criteria pollutant emissions would further minimize greenhouse gas emissions to the extent feasible. Also, the requirement that the owner use newer construction equipment will increase fuel efficiency and minimize tailpipe emissions (see Condition of Certification AQ-SC5.)

The CEC's Final Decision finds that the measures described above to directly and indirectly limit the emission of GHGs during the construction of ISEGS are in accordance with current best practices. The CEC therefore finds that the evidence shows that the GHG emissions from construction activities would not exceed the level of significance.

Operational Impacts

Operational emissions are expected from the boilers, fire pump, and emergency generators. As part of the Mitigated Ivanpah 3 proposal, the applicant is proposing to install larger steam turbine generators for the Ivanpah 1 and 2 plants. However, there are no proposed changes in the location, configuration, short-term hours of operation, or fuel usage for the emitting sources in the Ivanpah 1 and 2 power plants.

Air quality dispersion modeling using the U.S. EPA dispersion model AERMOD model indicated that, with the exception of the 1-hour NO_2 impacts, air quality impacts for all pollutants are reduced or are equivalent to the maximum modeled air quality impacts of the original configuration of the ISEGS project. The ISEGS Mitigated Ivanpah 3 project operation would not cause new violations of any NO_2, SO_2, $PM_{2.5}$ or CO ambient air quality standards, and therefore, the projects' direct operational NOx, SOx, $PM_{2.5}$ and CO emission impacts are not CEQA significant. Additional modeling analysis also indicated that the incremental increases in the 1-hour NO_2 impacts for the Mitigated Ivanpah 3 project would not create new exceedances of the state's 1-hour NO_2 ambient air quality standard. The results of the modeling analysis, as presented in CEC's FSA/DEIS (CEC 2009) and FSA Addendum (CEC 2010), are summarized in Table 3.3-9. The analysis did not include the new federal 1-hour NO_2 ambient air quality standard. This new standard is expressed as a 3-year average of the 98th percentile of the daily maximum 1-hour concentration (i.e., the 8th highest of daily highest 1-hour concentrations) and did not become effective until after publication of the CEC's FSA/DEIS and FSA Addendum. According to the CEC's FSA Addendum at the time of the analysis: "…(U.S. EPA) has not yet developed modeling software to generate the statistics in a form that can be used in a compliance demonstration. Therefore, the analyses described below do not include this project's impact on the new federal 1-hour NO_2 standard and the conclusions reached likewise do not include this impact…."

Table 3.3-9 Operation Emission Impacts for Mitigated Ivanpah 3 ISEGS Project

Pollutant	Avg. Period	Impacts[a] (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	Standard (µg/m³)	Percent of Standard
NO_2	1-hr	153.4	73.3	226.7	339	67%
	Annual	0.1	7.3	7.4	57	13%
PM_{10}	24-hr	3.2	96	99.2	50	198%
	Annual	0.5	12.7	13.2	20	66%
$PM_{2.5}$	24-hr	0.1	12.9	13.0	35	37%
	Annual	0.0	4.5	4.5	12	38%
CO	1-hr	282	4,025	4,307	23,000	19%
	8-hr	55	1,367	1,422	10,000	14%

Table 3.3-9 Operation Emission Impacts for Mitigated Ivanpah 3 ISEGS Project

Pollutant	Avg. Period	Impacts[a] (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	Standard (µg/m³)	Percent of Standard
SO_2	1-hr	2.6	94.3	96.9	665	15%
	24-hr	0.1	13.1	13.2	105	13%
	Annual	0.0	2.7	2.7	80	3%

Sources: CEC 2009 and CEC 2010
Notes:
[a] Impacts based on data presented in CEC 2009, Air Quality Table 10 and in CEC 2010, Addendum Air Quality Tables 1 and 2.

The modeled impacts from operation were added to the background concentrations to assess the impact from the ISEGS project. With the exception of 24-hour PM_{10}, there would be no new exceedances from the project operation (as indicated above). The implementation of fugitive dust mitigation practices would help reduce the emissions and thus the impacts from PM_{10}. Similar to the construction analysis, the results show that project operations would not cause violation of the NAAQS. Therefore, no significant NEPA impacts would occur after implementation of the mitigation measures (AQ-SC37 for operation). Similarly, in the case where there would be overlapping impacts from construction and operation, the modeling analysis indicates that there would be no significant NEPA impacts with mitigation.

Unless mitigated, the contribution of the Mitigated Ivanpah 3 project's direct and indirect, or secondary emissions to existing violations of the ozone and PM_{10} ambient air quality standards would likely be CEQA significant. Therefore, CEC staff recommends AQ-SC6 to mitigate the onsite maintenance vehicle emissions and AQ-SC7 to mitigate the operating fugitive dust emissions to ensure that the potential ozone and PM10 CEQA impacts are mitigated to less than significant over the life of the project.

The ISEGS Mitigated Ivanpah 3 project would comply with applicable District Rules and Regulations, including New Source Review requirements, and CEC staff recommends the inclusion of the Districts FDOC conditions as Conditions of Certification AQ-1 through AQ-39 and the addition of Condition of Certification AQ-SC9 to ensure that the emergency engines meet applicable model year emission standards.

The ISEGS area is nonattainment for ozone, therefore the emissions of NO_X and VOCs are analyzed in the ISEGS FSA/DEIS since they are precursors to ozone. In the absence of mitigation, there is a possibility for higher levels of ground-level ozone from the construction and operation of the ISEGS project.

Secondary particulate formation (assumed to be 100 percent $PM_{2.5}$) is the process of conversion from gaseous reactants to particulate products. The ISEGS project is not a notable source of ammonia emissions, so the small amount of operating NO_X and SO_X emissions that would be generated by this project would have a reduced potential to create secondary particulates.

The applicant proposed measures for operations include emission controls on boilers, purchase of a new engine for the emergency generator that would meet the Tier 2 emission standards, and use of a Tier 2 engine for the fire water pump. But based on the current New Source Performance Standards (NSPS) standards, the fire pump engine would not have emissions higher than the Tier 3 emission standards. The emission controls on boilers would include low NO_X burners, flue gas recirculation, and emission limits for criteria pollutants for all the boilers. ARB low sulfur diesel fuel would be used for the emergency generator engines.

The total operations GHG emissions estimate for the Mitigated Ivanpah 3 project scope, as presented in the FSA Addendum, is approximately 25,359 $MTCO_2e$. ISEGS is a solar project with a nightly shutdown so it will operate less than 60 percent of capacity; therefore, the project is not subject to the requirements of SB 1368 and the Greenhouse

Gas Emission Performance Standard. However, the ISEGS would easily comply with the requirements of SB 1368 and the Greenhouse Gas Emission Performance Standard.

The operation of the ISEGS Mitigated Ivanpah 3 plant would affect the overall electricity system operation and GHG emissions in several ways:

- ISEGS Mitigated Ivanpah 3 would provide low-GHG, renewable generation.
- ISEGS Mitigated Ivanpah 3 would facilitate to some degree the replacement of out-of-state high-GHG-emitting (e.g., coal) electricity generation that must be phased out in conformance with the State's new Emissions Performance Standard.
- ISEGS Mitigated Ivanpah 3 would facilitate to some extent the replacement of generation provided by aging fossil-fired power plants that use once-through cooling.

These system impacts would result in a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, staff concludes that the project would result in a cumulative overall reduction in GHG emissions from power plants, would not worsen current conditions, and would not result in impacts that are cumulatively CEQA significant.

Decommissioning Impacts

During closure and dismantling activities for the ISEGS project, the sources of air emissions would cease to operate and the only emissions would be those associated with exhaust and fugitive emissions generated during the dismantling process. The emissions are expected to be less than those occurring during construction. The CEQA air quality impacts are expected to be less than significant.

With the proposed mitigation measures in place, the project is not expected to have significant NEPA impacts or cause any violations of the CEQA significance criteria.

BLM's FEIS Impact Conclusions

Construction Impacts

The construction impacts resulting from the Mitigated Ivanpah 3 Alternative would be associated with fugitive dust emissions, emissions from construction vehicles, and emissions from worker commuting vehicles. In addition, a small amount of hydrocarbon emissions may occur because of the temporary storage of petroleum fuel at the site.

This modeling analysis for the original ISEGS project scope indicated, with the exception of 24-hour PM_{10} impacts, that the project would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. BLM notes that the maximum local background 24-hour measurements of PM_{10} may be substantially impacted by wind-blown dust. However, in light of the existing PM_{10} and ozone non-attainment status for the project site area, the construction NOx, VOC, and PM emissions would be potentially adverse and, therefore, the off-road equipment and fugitive dust emissions should be mitigated to the extent feasible. The modeling analysis shows that, after implementation of the fugitive dust mitigation measures, the project's construction is not predicted to cause violations of the NAAQS. Therefore, no direct adverse impacts would occur after implementation of the fugitive dust mitigation measures.

The construction of the Mitigated Ivanpah 3 Alternative would be expected to generate approximately the same rates of fugitive dust, construction vehicle emissions, and worker commuting vehicle emissions as the ISEGS original proposed project. Although the size, number of power tower receivers, and number of heliostats would be reduced, it is expected that the construction would occur with the same type and amount of equipment and workers as the proposed project. The primary difference would be that the duration of construction would be expected to be shorter for the Mitigated Ivanpah 3 Alternative, by approximately 17 percent (48 months for the proposed project versus 40 months for the Mitigated Ivanpah 3 Alternative). Although the rate of emissions would be the same for the construction of both alternatives, the overall mass of emissions associated with the Mitigated Ivanpah 3 Alternative would be lower, due to the reduced duration of construction.

Although the air quality impacts associated with construction of the Mitigated Ivanpah 3 Alternative would be reduced from those associated with the proposed project, it would still potentially cause direct, adverse air quality impacts. Therefore, mitigation measures AQ-SC1 through AQ-SC4 would also be applicable to the Mitigated Ivanpah 3 Alternative. Mitigation measures AQ-SC1 to AQ-SC4 incorporate the applicant's proposed measures, with revisions and additions to reduce the impacts from the construction of the proposed project. Specific changes include a more aggressive dust control requirement to use polymer based, or equivalent, soil stabilizers on the site's unpaved roads and inactive disturbed surfaces during construction.

The construction-related GHG emissions sources associated with the Mitigated Ivanpah 3 Alternative would be the same as those described for the proposed project, including emissions from vehicles and heavy equipment. Overall, these GHG emissions would be lower than those associated with the proposed project, due to the reduced number of heliostats and power towers, and the reduced duration of construction. Construction-related GHG emissions from the proposed project would likely result in minimal adverse impacts; however, since emissions associated with this alternative would be even lower, there would not be expected to be any adverse impacts from GHG emissions.

Operational Impacts

Operations impacts associated with the Mitigated Ivanpah 3 Alternative would result from the following sources:

- Fugitive dust from vehicle traffic on unpaved roads and maintenance paths;
- Emissions from maintenance vehicles;
- Emissions from worker's commuting vehicles; and
- Emissions from stationary sources such as the boilers, emergency generators, and emergency fire water pumps.

This modeling analysis for the original ISEGS project scope indicated, with the exception of 24-hour PM_{10} impacts, that the project would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. BLM notes that the maximum local background 24-hour measurements of PM_{10} may be substantially impacted by wind-blown dust. However, in light of the existing PM10 and ozone non-attainment status for the project site area, the operating NOx, VOC, and PM emissions could potentially result in direct impacts and, therefore, the stationary equipment, the off-road maintenance equipment, and fugitive dust emissions should be mitigated to the extent feasible. The modeling analysis shows that, after implementation of the fugitive dust mitigation measures, the project's operation is not predicted to cause violations of the NAAQS. Therefore, no adverse impacts would be expected to occur after implementation of the fugitive dust mitigation measures.

The applicant also provided a modeling analysis using the EPA-approved AERMOD model to estimate the impacts of the project's NOx, PM_{10}, CO, and SOx emissions resulting from worst-case overlap when the project is in partial operation and still being constructed. Similar to the assessment of the construction and operating impacts, BLM added the modeled impacts to the available highest ambient background concentrations recorded during the previous three years from nearby monitoring stations to assess the project's overlapping construction/operation impacts. This modeling analysis again indicates, with the exception of 24-hour PM_{10} impacts, that the project would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. Considering the existing PM_{10} and ozone non-attainment status for the project site area, the construction and operating NOx, VOC, and PM emissions could potentially result in adverse impacts and, therefore, these construction and operations emission sources should be mitigated to the extent feasible. The modeling analysis shows that, after implementation of the fugitive dust mitigation measures, the project's worst-case construction/operation overlap period is not predicted to cause violations of the NAAQS. Therefore, no adverse impacts would be expected to occur after implementation of the fugitive dust mitigation measures.

There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the ISEGS project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region, which are already designated nonattainment for the state ozone standard.

The northeastern San Bernardino County portion of the Mojave Desert Air Basin has not undergone the rigorous secondary particulate studies that have been performed in other areas of California, such as the San Joaquin Valley, that have more serious fine particulate pollution problems. However, due to the limited agricultural activity in the area the project site area would likely be characterized as ammonia poor, and the ISEGS project is not a notable source of ammonia emissions, so the small amount of operating NOx and SOx emissions that would be generated by this project would have a reduced potential to create secondary particulates.

In the submittal describing the Mitigated Ivanpah 3 proposal the applicant's original air modeling for the stationary sources was modified to account for the differences in the number, size, and locations of the sources with respect to the property boundaries. The other factors, including background concentrations, meteorological input data, and the modeling methodology were kept the same as those used for the original modeling. The primary differences between the proposed project and the Mitigated Ivanpah 3 Alternative included:

- The size of the boiler at Ivanpah Unit 3 was reduced from 462.2 to 231.1 MMBtu/hr (50 percent), resulting in a reduction in fuel use.
- One of the two emergency generators proposed for Ivanpah Unit 3 for the proposed project would be eliminated in the Mitigated Ivanpah 3 Alternative.
- The Ivanpah Unit 3 power block, including the associated emissions sources (boiler, emergency generator, and emergency fire pump), would be moved 272 feet to the southwest, which is closer to the ROW boundary than as in the proposed project.

In general, these changes result in a lower mass of emissions from the Mitigated Ivanpah 3 Alternative, as compared to the proposed project, and therefore reduced concentrations of almost all pollutants in almost all locations and durations. The only exception is the modeling result for NO_2 impacts, which shows an increase in short-term (1-hour and 3-hour) concentrations at the site boundary. This result occurs because, even though the number of emergency generators was reduced from two to one, the original modeling assumed that only one would operate at any given time. Therefore, the total amount of emissions released during the short-term testing of the emergency generator was the same in the modeling for the proposed project and the Mitigated Ivanpah 3 Alternative. Because the generator in the Mitigated Ivanpah 3 Alternative is located 272 feet closer to the site boundary, the result for the short-term analyses (1-hr and 3-hr) showed an increase over the proposed project. However, the increase in maximum concentration is small (123.7 ug/m3 for the proposed project versus 126.7 ug/m3 for the Mitigated Ivanpah 3 Alternative), and the overall mass of emissions per year would be reduced by 50 percent.

Overall, air emissions associated with operation of the Mitigated Ivanpah 3 Alternative would be lower than those associated with the proposed project. However, the emissions could still cause direct, adverse impacts to air quality in the absence of mitigation measures. Mitigation measure AC-SC7 would also be applicable to the Mitigated Ivanpah 3 Alternative. However, due to the different sizes of boilers associated with the Mitigated Ivanpah 3 Alternative, the District permit conditions would be different for this alternative (updated mitigation measures AQ-1 – through AQ-31 are provided in Section 3.12.5.4)

By generating needed power with only a small supplemental use of fossil fuels, the Mitigated Ivanpah 3 Alternative would potentially displace greenhouse gas and pollutant emissions associated with fossil fuel-powered generating facilities in the transmission area. The features of the Mitigated Ivanpah 3 alternative that would involve GHG emissions from operations that are different than those of the proposed project are:

- Reduction in annual fuel usage in the auxiliary boilers resulting primarily from the 50% reduction in the capacity for the Ivanpah 3 auxiliary boiler,
- Reduction in the acreage of vegetation (natural carbon uptake) that would be disturbed;
- Elimination of one of the emergency generators for Ivanpah 3, and
- Elimination of approximately 40,000 heliostats (from 213,500 to 173,500) which reduce the vehicle miles travelled (VMT) for maintenance (i.e., mirror washing) and the associated tailpipe GHG emissions.

The estimate of GHG emissions for the Mitigated Ivanpah 3 Alternative, including stationary sources and onsite and offsite mobile sources, would be permitted, on an annual basis, to emit approximately 20,900 $MTCO_2e$ per year if operated at its maximum permitted level.

Like the proposed project, the Mitigated Ivanpah 3 Alternative would disturb natural vegetation that acts to uptake carbon dioxide. Because the footprint of the Mitigated Ivanpah 3 Alternative would be reduced by approximately 9 percent, the disturbance of natural vegetation would be reduced by the same amount. For the 3,564 acre footprint of the Mitigated Ivanpah 3 Alternative, the maximum equivalent loss in carbon uptake would be 5,316 MT of CO_2 per year, which would correspond to 0.006 MT of CO_2 per MW generated. Like the proposed project, the natural carbon uptake loss is negligible in comparison with the reduction in fossil fuel CO_2 emissions.

Decommissioning Impacts

Similar to construction, the closure and decommissioning impacts resulting from the Mitigated Ivanpah 3 Alternative would be associated with fugitive dust emissions, emissions from heavy equipment, and emissions from worker commuting vehicles. For the proposed project, these emissions would not have an adverse impact on air quality, for the following reasons:

- The activities would have a much shorter duration than construction;
- Emissions from equipment would be expected to be lower due to technology advancement; and
- The activities would likely be controlled with mitigation measures that were equivalent or superior to those used for construction.

Based on these factors, including the shorter duration associated with decommissioning the reduced acreage of disturbance, reduced number of heliostats, and reduced number of power tower receivers, adverse impacts associated with closure and decommissioning of the Mitigated Ivanpah 3 Alternative would not be expected.

The closure-related GHG emissions sources associated with the Mitigated Ivanpah 3 Alternative would be the same as those described for the proposed project, including emissions from vehicles and heavy equipment. Overall, these GHG emissions would be lower than those associated with the proposed project, due to the reduced number of heliostats and power towers, and the reduced duration of decommissioning. Closure-related GHG emissions from the proposed project would result in minimal adverse impacts; however, since emissions associated with this alternative would be even lower, no adverse impacts would be anticipated from GHG emissions.

3.3.5.4 ISEGS Conditions of Certification/Mitigation Measures

CEC Conditions of Certification

CEC conditions AQ-SC1 through AQ-SC4 and AQ-SC7 are both CEQA and NEPA mitigation conditions. CEC conditions AQ-SC5, AQ-SC6, and AQ-SC8 through AQ-SC10 are CEQA-only conditions.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification AQ-SC3, AQ-SC4 and AQSC5 for the entire project site and linear facility construction.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification AQSC3, AQ-SC4, and AQ-SC5.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the BLM's Authorized Officer and CPM in each Monthly Compliance Report that demonstrates compliance with the following mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the project.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with stated mitigation measures for purposes of controlling diesel construction-related emissions.

AQ-SC6 The project owner, when obtaining dedicated vehicles for mirror washing activities and other facility maintenance activities, shall only obtain new model year vehicles that meet California on-road vehicle emission standards for the model year when obtained.

AQ-SC7 The project owner shall provide a site operations dust control plan, including all applicable fugitive dust control measures identified in AQ-SC3 that would be applicable to reducing fugitive dust from ongoing operations.

AQ-SC8 The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) for the facility.

AQ-SC9 The emergency generator and fire pump engines procured for this project will meet or exceed the NSPS Subpart IIII emission standards for the model year that corresponds to their date of purchase.

AQ-SC10 The ISEGS 1, ISEGS 2, and ISEGS 3 boilers shall not exceed a total annual natural gas fuel heat input that is more than 5 percent of the total annual heat input from the sun for ISEGS 1, ISEGS 2, and ISEGS 3, respectively.

District Conditions of Certification

District conditions AQ-1 through AQ-31 are CEQA-only required conditions.

Conditions Applicable to Ivanpah 1, 2, and 3 Boilers

AQ-1 Operation of this equipment must be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

AQ-2 The owner/operator shall operate this equipment in strict accord with the recommendations of the manufacturer or supplier and/or sound engineering principles and consistent with all information submitted with the application for this permit, which produce the minimum emission of air contaminants.

AQ-3 This boiler shall use only natural gas as fuel and shall be equipped with a meter measuring fuel consumption in standard cubic feet.

AQ-4 The owner owner/operator shall maintain a current, on-site (at a central location if necessary) log for this equipment for five (5) years, which shall be provided to District, state or federal personnel upon request. This log shall include calendar year fuel use for this equipment in standard cubic feet, or BTU's, and daily hours of operation.

AQ-5 Not later than 180 days after initial startup, the operator shall perform an initial compliance test on this boiler in accordance with the District Compliance Test Procedural Manual.

AQ-6 The owner/operator shall perform annual compliance tests in accordance with the District Compliance Test Procedural Manual. Prior to performing these annual tests, the boiler shall be tuned in accord with the manufacturer's specified tune-up procedure, by a qualified technician.

AQ-7 This boiler shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart Db - Standards of Performance for Industrial – Commercial-Institutional Steam Generating Units (NSPS Db).

AQ-8 Records of fuel supplier certifications of fuel sulfur content shall be maintained to demonstrate compliance with the sulfur dioxide and particulate matter emission limits.

AQ-9 The owner/operator shall continuously monitor and record fuel flow rate and flue gas oxygen level.

AQ-10 In lieu of installing CEMs to monitor NOx emissions, and pursuant to 40 CFR 60 Subpart Db, Section 60.49b(c), the owner/operator shall monitor boiler operating conditions and estimate NOx emission rates per a District approved emissions estimation plan.

AQ-11 The owner/operator shall comply with all applicable recordkeeping and reporting requirements of NSPS Db.

AQ-12 This boiler shall not burn more than 0.9 MMSCF of natural gas in any single day, and no more than 328 MMSCF in any calendar year.

Conditions Applicable to Ivanpah 1, 2 and 3 Emergency Fire Pumps

AQ-13 This system shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

AQ-14 These engines may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engines are located or expects to order such outages at a particular time, the engines are located in the area subject to the rotating outage, the engines are operated no more than 30 minutes prior to the forecasted outage, and the engines are shut down immediately after the utility advises that the outage is no longer imminent or in effect.

AQ-15 These engines may operate in response to fire suppression requirements and needs.

AQ-16 These units shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

AQ-17A non-resettable four-digit (9,999) hour timer shall be installed and maintained on these units to indicate elapsed engine operating time.

AQ-18 These units shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, this unit shall be operated no more than 50 hours per year for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

AQ-19 The hour limit of AQ-1828 can be exceeded when the emergency fire pump assemblies are driven directly by a stationary diesel fueled CI engine when operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 2006 edition or the most current edition approved by the CARB Executive Officer. {Title 17 CCR 93115(c)16}

AQ-20 The owner/operator shall maintain a operations log for these units current and on-site, either at the engine location or at a on-site location, for a minimum of two (2) years, and for another year where it can be made available to the District staff within 5 working days from the District's request, and this log shall be provided to District, State and Federal personnel upon request.

AQ-21 These fire protection units are subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the more stringent requirements shall govern.

AQ-22 This unit is subject to the requirements of the Federal New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Conditions Applicable to Ivanpah 1, 2, and 3 Emergency Generators

AQ-23 Engine may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engine is located or expects to order such outages at a particular time, the engine is located in the area subject to the rotating outage, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

AQ-24 This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

AQ-25 This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

AQ-26 A non-resettable four-digit (9,999) hour timer shall be installed and maintained on this unit to indicate elapsed engine operating time.

AQ-27 This unit shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, this unit shall be operated no more than 50 hours per year, and no more than 0.5 hours per day for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

AQ-28 The owner/operator shall maintain an operations log for this unit current and on-site (or at a central location) for a minimum of five (5) years, and this log shall be provided to District, State and Federal personnel upon request.

AQ-29 This genset is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the more stringent requirements shall govern.

AQ-30 This unit shall not be used to provide power during a voluntary agreed to power outage and/or power reduction initiated under an Interruptible Service Contract (ISC); Demand Response Program (DRP); Load Reduction Program (LRP) and/or similar arrangement(s) with the electrical power supplier.

AQ-31 This unit is subject to the requirements of the Federal New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Green House Gas Emissions

No Conditions of Certification related to project greenhouse gas emissions are proposed because the project would create beneficial GHG impacts. The project owner would comply with any future applicable GHG regulations formulated by the ARB or the U.S.EPA, such as GHG reporting or emissions cap and trade markets.

BLM Mitigation Measures

The BLM carries forward the same mitigation measures in the ISEGS FEIS as were discussed in the CEC/BLM FSA/DEIS. The summary of the FEIS indicates that AQ-SC1 through AQ-SC10 are either components of monitoring to be managed by the CEC or a specific CEC specific requirement. The district (MDAQMD) conditions of certification for the Mitigated Ivanpah 3 alternative are represented in AQ-1 through AQ-31.

No mitigation measures related to Greenhouse Gas emissions are proposed. The project owner would comply with any future applicable GHG regulations formulated by the ARB, such as GHG reporting or emissions cap and trade markets.

3.3.6 Combined Impact of EITP and ISEGS

The CEQA and NEPA impact analyses for EITP and ISEGS were based on similar significance criteria that evaluated to what extent the proposed projects would impact air quality and effect GHG emissions during construction and operation of each project.

Air Quality

The CPUC concluded that construction activities associated with the EITP would generate emissions of fugitive dust (PM_{10} and $PM_{2.5}$) and NO_x that could result in short-term significant air quality impacts. The BLM and CEC had similar conclusions regarding the construction of the ISEGS. However, the BLM and CEC concluded that mitigation measures would likely reduce the impacts of fugitive dust emissions during the construction of the ISEGS to a less than significant level. The majority of construction of the EITP would not occur in proximity to the ISEGS. During these periods, there would likely be no combined impacts. However, during the periods when construction of the EITP is near the ISEGS, the combined impact of both projects could result in air quality impacts greater than the projects individually. Because the EITP would result in short-term significant air quality impacts, if construction of the EITP and the ISEGS overlap and occur within proximity to each other, the EITP and the ISEGS together would result in a short-term significant air quality impact.

The CPUC concluded that the operational activities associated with the EITP following construction would result in only very low levels of emissions of criteria air pollutants. Thus, the long-term impacts associated with EITP operational emissions would be less than significant. The BLM and CEC identified numerous stationary and mobile source emissions associated with the ISEGS. The BLM and CEC have concluded that air emission controls and mitigation measures would result in the impacts from ISEGS operational air pollutant emissions being less than significant. Since EITP operational emissions would be very minor and in most instances occur at long distances form the ISEGS, the combined impacts from EITP and ISEGS would be equivalent to the impacts of the projects individually.

GHGs

Construction activities associated with the EITP would generate GHG missions. The CPUC concluded these GHGs emissions would be short-term and less than significant. The BLM and CEC had similar conclusions regarding GHG emissions generated during construction of the ISEGS. The combined GHG emissions from construction of the EITP (i.e., 6,950 $MTCO_2e$) and ISEGS (i.e., 17,779 $MTCO_2e$) are estimated at 24,729 $MTCO_2e$. Amortized over a 30-year period, these combined GHG emissions would be approximately 824 $MTCO_2e$ per year on an annual basis. This value is well below the significance threshold of 10,000 $MTCO_2e$ per year adopted by the CPUC. Thus, the combined GHG emissions from construction activities do not represent a significant impact.

The CPUC concluded that the operational activities associated with the EITP following construction would result in only very low levels of GHG emissions (i.e., 194 $MTCO_2e$ per year). Thus, the long-term impacts associated with EITP operational GHG emissions would be less than significant. The BLM and CEC identified numerous stationary and mobile source emissions associated with the ISEGS and also concluded that GHG emissions would be less than significant. Further, the BLM and CEC identify the potential benefits of the ISEGS of replacing fossil-fueled power which could result in a net decrease in GHG emissions.

The CEC and the BLM analysis for the ISEGS project and the analysis included in this document for the EITP use different approaches and methodologies for calculating GHG impacts; nevertheless, the combined impact of the EITP and ISEGS due to GHG emissions would be less than significant. The GHG emissions from the EITP would be less than 1% of the GHG emissions from the ISEGS; therefore, the EITP contribution to the combined impacts is inconsequential. Though the BLM and the CEC have determined that the ISEGS project would result in a less than significant impact under this criterion, the annual operational emissions of the ISEGS (i.e., 27,444 $MTCO_2e$ per year) would be greater than the significance threshold of 10,000 $MTCO_2e$ per year adopted by the CPUC. However, unlike the CPUC's analysis of the impacts of GHG emissions for the EITP, the BLM and CEC take into account the fact that ISEGS would likely provide a beneficial reduction in indirect GHG emissions by potentially replacing fossil-fuel electric power plants, although the beneficial reduction potential is not quantified in the BLM and CEC analysis. Therefore because ISEGS would be consistent with plans to reduce long-term emissions of GHGs, the BLM and CEC have determined that the impact of GHG emissions associated with the ISEGS project would be less than significant. The differences in methodologies and thresholds employed for the EITP and the ISEGS project reflect both differences in agency policy and differences in the nature of generation and transmission projects. Because the operational GHG emissions of the EITP would be so minimal as to be inconsequential and because the GHG emissions of ISEGS, when considering the benefit of replacing fossil fuel generation sources with a renewable generation source, would be less than significant, the combined impact of the EITP and ISEGS would be less than significant under this criterion.

~~3.3.5 Whole of the Action / Cumulative Action~~

~~Below is a summary of information related to air quality and GHGs in the ISEGS Final Staff Assessment / Draft Environmental Impact Statement (FSA/DEIS) prepared by the California Energy Commission (CEC) and the BLM. This section focuses on differences in the ISEGS setting and methodology compared with the setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the CEC and the BLM for the ISEGS project.~~

~~3.3.5.1 Setting~~

~~Since the ISEGS project is located in the Southern California Mojave Desert close to the California-Nevada border, the environmental setting is very similar to that of the EITP.~~

~~Applicable Laws, Regulations, and Standards~~

~~Due to the variation in project components and location between EITP and ISEGS, different laws, regulations, and standards would apply to ISEGS than those listed above for EITP (see Table 3.3-8). Since ISEGS would be developed entirely within California on BLM land, the Nevada regulations associated with the EITP would not apply. ISEGS project components and operational features that trigger additional laws, regulations, and standards include:~~

- ~~Three solar concentrating thermal power plants with one natural-gas-fired steam boiler each~~
- ~~Natural gas supplied through a 6-mile distribution pipeline~~
- ~~Air cooled condensers at each of the three plants~~
- ~~Diesel-fired 240-hp fire pump engine at each plant~~
- ~~Four 3,750-hp emergency generator engines~~
- ~~Tractor-pulled mirror washing trailers~~

~~Table 3.3-8 Laws, Regulations, and Standards Applicable to the ISEGS Project~~

~~Law, Regulation, or Standard~~	~~Description~~	~~Project Component~~
~~Federal~~		
~~40 CFR Part 52~~	~~Nonattainment NSR requires a permit, BACT, and offsets. Permitting and enforcement is delegated to MDAQMD.~~ ~~PSD requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The ISEGS project is a new source that has a rule-listed emission source; thus, the PSD trigger levels are 100 tons per year for~~ NO_X, ~~VOCs,~~ SO_2, $PM_{2.5}$, ~~and CO.~~ ~~The ISEGS project's proposed emissions are below NSR and PSD applicability thresholds.~~	~~Operations~~
~~40 CFR Part 60~~	~~NSPS, Subpart D, Standards of Performance for Electricity Steam Generation Units. Establishes emission standards and monitoring/recordkeeping requirements for units with greater than 250 MM BTU/hr heat input.~~ ~~Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for these engines, which include emergency fire water pump engines.~~	~~Operations~~
~~State~~		
~~HSC Section 40910-40930~~	~~Permitting of source needs to be consistent with CARB-approved Clean Air Plans.~~	~~Operations~~
~~HSC Section 41700~~	~~Restricts emissions that would cause nuisance or injury.~~	~~Operations~~
~~CCR Section 93115~~	~~Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the types of fuels allowed, establishes maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines including emergency fire water pump engines.~~	~~Operations~~
~~Local~~		
~~Rule 404 Particulate Matter – Concentration~~	~~Limits the particulate matter concentration from stationary source exhausts.~~	~~Operations~~
~~Rule 900 Standard of Performance for New Stationary Source~~	~~Incorporates the Federal NSPS (40 CFR 60) rules by reference.~~	~~Operations~~
~~Regulation XII – Federal Operating Permits~~	~~Requires that new or modified major facilities or facilities that trigger NSPS, Acid Rain or other federal air quality programs obtain a Title V federal operating permit.~~	~~Operations~~

~~Table 3.3-8 Laws, Regulations, and Standards Applicable to the ISEGS Project~~

~~Law, Regulation, or Standard~~	~~Description~~	~~Project Component~~
~~Rule 1210 – Acid Rain~~	~~Requires that facilities subject to the federal Acid Rain program obtain permits and comply with emissions and monitoring provisions.~~	~~Operations~~
~~Rule 1303 – New Source Review~~	~~Specifies BACT/offsets technology and requirements for any new emissions unit that has potential to emit any affected pollutants.~~	~~Operations~~
~~Rule 1306 – Electric Energy Generating Facilities~~	~~Describes actions to be taken for permitting of power plants that are within the jurisdiction of the California Energy Commission.~~	~~Operations~~

~~Key:~~
~~BACT = Best Available Control Technology~~
~~CARB = California Air Resource Board~~
~~CCR = California Code of Regulations~~
~~CFR = Code of Federal Regulations~~
~~CO = carbon monoxide~~
~~HSC = Health and Safety Code~~
~~MDAQMD = Mojave Desert Air Quality Management District~~
~~MM BTU/hr = 1 million British Thermal Units per hour~~
~~NO_X = nitrogen oxides~~
~~NSPS = New Source Performance Standards~~
~~$PM_{2.5}$ = particulate matter with a diameter of 2.5 micrometers or less~~
~~PSD = Prevention of Significant Deterioration~~
~~SO_2 = sulfur dioxide~~
~~VOC = volatile organic compound~~

~~3.3.5.2 Methodology~~

~~The methodology for analyzing impacts for the ISEGS project was similar to that used for the EITP; differences are noted below. CEC staff primarily used two CEQA significance criteria to evaluate the ISEGS project. First, all project emissions of nonattainment criteria pollutants and their precursors (NO_X, VOC, PM_{10}, and SO_2) were considered CEQA significant cumulative impacts that must be mitigated. Second, any AAQS violation or any contribution to any AAQS violation caused by any project emissions was considered CEQA significant and mitigation was required. BACT would be applied to both the onsite stationary and the non-stationary sources for the ISEGS project. For the NEPA analysis, the Prevention of Significant Deterioration (PSD) threshold was considered in addition to the NAAQS and general conformity considered above for EITP. Also, the emissions from the proposed project, both stationary source and onsite mobile source, were analyzed for ISEGS using air dispersion models to determine the probable impacts at ground level.~~

~~3.3.5.3 Impacts~~

~~The CEC and BLM have published the following impacts related to air quality and GHGs for the ISEGS project:~~

~~Construction Impacts~~

~~The ISEGS project would consist of three phases, with total construction duration of 48 months. Activities such as site preparation, construction, and installation of major equipment and structures would result in fugitive dust emissions and emissions from equipment exhausts. In addition, a small amount of hydrocarbon emissions may occur because of the temporary storage of petroleum fuel at the site. Air dispersion modeling was done to analyze the ground level impacts from all construction activities. Peak hourly, daily, and annual construction equipment exhaust and fugitive dust emissions were used to perform the modeling analysis. The modeled impacts from construction activities were added to the background concentrations to assess the impact from the project. The modeling results indicated that there would be no new exceedances created except for 24-hour PM_{10}. Since the area is nonattainment for PM_{10}, feasible mitigation measures would be implemented for the ISEGS project. The modeling analysis shows that, after implementation of the recommended fugitive dust mitigation measures, the project's construction would not~~

~~cause violations of the ambient air quality standards. Therefore, no significant NEPA impacts would occur after implementation of the mitigation measures.~~

~~To mitigate the impacts from the construction of the facility, the applicant has proposed to follow the mitigation measures from the SCAQMD CEQA guidelines. In addition to those, the BLM and CEC have recommended the use of polymer based soil stabilizers, or equivalent, on the site's unpaved roads and inactive disturbed surfaces during construction.~~

~~Construction-related impacts associated with GHG emissions during construction were not quantified in the ISEGS FSA/DEIS.~~

~~Operational Impacts~~

~~Operational emissions are expected from the boilers, fire pump, and emergency generator. The impacts were analyzed with the help of the U.S. EPA dispersion model AEMROD. The modeled impacts from operation were added to the background concentrations to assess the impact from the ISEGS project. With the exception of 24-hour PM_{10}, there would be no new exceedances from the project operation. The implementation of fugitive dust mitigation practices would help reduce the emissions and thus the impacts from PM_{10}. Similar to the construction analysis, the results show that project operations would not cause violation of the NAAQS. Therefore, no significant NEPA impacts would occur after implementation of the mitigation measures. Similarly, in the case where there would be overlapping impacts from construction and operation, the modeling analysis indicates that there would be no significant NEPA impacts with mitigation.~~

~~The ISEGS area is nonattainment for ozone, therefore the emissions of NO_X and VOCs are analyzed in the ISEGS FSA/DEIS since they are precursors to ozone. In the absence of mitigation, there is a possibility for higher levels of ground-level ozone from the construction and operation of the ISEGS project.~~

~~Secondary particulate formation (assumed to be 100 percent $PM_{2.5}$) is the process of conversion from gaseous reactants to particulate products. The ISEGS project is not a notable source of ammonia emissions, so the small amount of operating NO_X and SO_X emissions that would be generated by this project would have a reduced potential to create secondary particulates.~~

~~The applicant proposed measures for operations include emission controls on boilers, purchase of a new engine for the emergency generator that would meet the Tier 2 emission standards, and use of a Tier 2 engine for the fire water pump. But based on the current New Source Performance Standards (NSPS) standards, the fire pump engine would not have emissions higher than the Tier 3 emission standards. The emission controls on boilers would include low NO_X burners, flue gas recirculation, and emission limits for criteria pollutants for all the boilers. ARB low sulfur diesel fuel would be used for the emergency generator engines.~~

~~Although the onsite emissions of GHGs was predicted to be approximately 25,000 MT/yr, CEC concluded that the ISEGS project overall would reduce GHG emissions.~~

> ~~"The operation of the ISEGS Mitigated Ivanpah 3 plant would affect the overall electricity system operation and GHG emissions in several ways:~~
>
> - ~~ISEGS Mitigated Ivanpah 3 would provide low-GHG, renewable generation.~~
> - ~~ISEGS Mitigated Ivanpah 3 would facilitate to some degree the replacement of out-of-state high-GHG-emitting (e.g., coal) electricity generation that must be phased out in conformance with the State's new Emissions Performance Standard.~~
> - ~~ISEGS Mitigated Ivanpah 3 would facilitate to some extent the replacement of generation provided by aging fossil-fired power plants that use once-through cooling.~~

> ~~These system impacts would result in a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, staff concludes that the project would result in a cumulative overall reduction in GHG emissions from power plants, would not worsen current conditions, and would not result in impacts that are cumulatively CEQA significant."~~

~~Decommissioning Impacts~~

~~During closure and dismantling activities for the ISEGS project, the sources of air emissions would cease to operate and the only emissions would be those associated with exhaust and fugitive emissions generated during the dismantling process. The emissions are expected to be less than those occurring during construction. The CEQA air quality impacts are expected to be less than significant.~~

~~With the proposed mitigation measures in place, the project is not expected to have significant NEPA impacts or cause any violations of the CEQA significance criteria.~~

~~3.3.5.4 Mitigation Measures~~

~~The ISEGS FSA/DEIS recommends that the following Conditions of Certification be required by the CEC and the BLM to lessen impacts to air quality and GHGs if the ISEGS project is approved:~~

~~Air Quality Staff Conditions of Certification:~~

~~**AQSC-1:** The project owner shall designate and retain an onsite Air Quality Construction Mitigation Manager (AQCMM) who shall be responsible for directing and documenting compliance with Conditions of Certification AQSC3, AQ-SC4, and AQ-SC5 for the entire project site and linear facility construction.~~

~~**AQ-SC2:** The project owner with the AQCMP shall provide an Air Quality Construction Mitigation Plan for approval, which details the steps to ensure compliance with Conditions of Certification AQ-SC3, AQ-SC4, and AQ-SC5.~~

~~**AQ-SC3**: The AQCMM shall submit documentation that shows compliance with the fugitive measures to the BLM's Authorized Officer and CPM in each Monthly Compliance Report.~~

~~**AQ-SC4:** The AQCMM shall monitor all construction activities for visible dust plumes.~~

~~**AQ-SC5**: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the mitigation measures for controlling diesel construction-related emissions.~~

~~**AQ-SC6:** The project owner, when obtaining dedicated vehicles for mirror washing activities and other facility maintenance activities, shall only obtain new model year vehicles that meet California on-road vehicle emission standards for the model year when obtained.~~

~~**AQ-SC7:** The project owner shall provide a site operations dust control plan, including all applicable fugitive dust control measures identified in AQ-SC3.~~

~~**AQ-SC8:** The project owner shall provide the CPM copies of all district-issued Authority to Construct (ATC) and Permit to Operate (PTO) for the facility.~~

~~**AQ-SC9:** The emergency generator and fire pump engines procured for this project will meet or exceed the NSPS Subpart IIII emission standards for the model year that corresponds to their date of purchase.~~

~~**AQ-SC10:** The ISEGS 1, ISEGS 2, and ISEGS 3 boilers shall not exceed a total annual natural gas fuel heat input that is more than 5 percent of the total annual heat input from the sun for ISEGS1, ISEGS2, and ISEGS 3, respectively.~~

3.4 Biological Resources

This section describes the environmental setting, regulatory setting, and potential impacts of the construction and operation of the proposed project and alternatives with respect to biological resources. Information in this section is largely based on the Eldorado–Ivanpah Transmission Project Biological Technical Report (EPG 2009) and the Proponent's Environmental Assessment (PEA) dated May 28, 2009, as prepared by Southern California Edison (SCE, hereafter referred to as the applicant). Details on locations of the EITP facilities, rights-of-way (ROWs), extra workspaces, and staging areas can be found in Chapter 2. Chapter 2 also provides a detailed description of construction, operation, and maintenance techniques used for the proposed project and alternatives to the proposed project. Comments received from the general public and resource agencies during the scoping process are evaluated and addressed as well in Section 3.4.3, "Impact Analysis."

3.4.1 Environmental Setting

The EITP is located within the Eldorado and Ivanpah valleys in southern Clark County, Nevada, and in San Bernardino County in southeastern California. The project would cross public and privately owned lands (see Section 3.9, "Land Use, Agricultural Resources, and Special Management Areas"). Most of the lands that would be crossed by the transmission line in California are administered by the BLM. Small segments would cross private parcels at Nipton, California, and in the vicinity of the Mountain Pass Substation. Similarly, the EITP in Nevada is predominantly situated on BLM lands, but private lands would be crossed near the Eldorado Substation and possibly at Primm, Nevada.

Environmental analysis for biological resources is confined by the natural geographic boundaries of the region in which the EITP is sited. The region is comprised of alternating valleys and abrupt mountain ranges with gently sloping aprons of sediment debris spread along the slopes. The mountains drain to interior closed basins with playa lakes in the valley bottoms. Specifically, environmental analysis incorporates the drainage footprint of the Eldorado, Ivanpah, Roach, and Jean playa lake beds that are present in the Eldorado, Ivanpah, and Jean valleys (see Figure 3.8-2 in Section 3.8, "Hydrology and Water Quality"). These playas are typically high in evaporated salts, and associated plant communities are usually composed of salt-tolerant species. The analysis also incorporates the seven mountain ranges that surround the proposed project area. These ranges are typically rugged and characterized by cliffs, ledges, and formations with small pockets and crevices. Historic abandoned mines are located in some of the mountain ranges (EPG 2009). The Clark-Mountain~~s~~ Range bounds the far western edge of the proposed project, while the Spring Mountains are to the north of the existing transmission line just above Primm, Nevada. At the eastern edge of the Ivanpah Valley in Nevada, the transmission line passes between Sheep Mountain to the north and the north end of the Lucy Gray Mountains, and then passes through the northern McCullough ~~Mountains~~ Range. The telecommunication line alternatives pass between the Highland Range to the east and the South McCullough Range to the west ~~of the Highland Ranges~~, and, further south, between the McCullough Range and New York ~~mountains~~ Mountains and between the South McCullough Range and the Clark Mountain Range.

The entire EITP is within the Mojave Desert biome. A generally accepted elevation range for the Mojave Desert is from -479 feet in Death Valley, California, to 4,500 feet along the northern edge of the biome, and up to 5,500 feet in the mountains. Elevations within the EITP 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, and is predominantly associated with winter rains, which occur from mid-December through early March.

3.4.1.1 Existing Conditions

Survey Methodology and Coverage

Information on biological resources within the EITP was gathered through field surveys and desktop analyses. All f~~F~~ield surveys were conducted by the applicant and their biological consultants. As the third-party contractor charged with identifying and assessing project impacts, Ecology and Environment, Inc., independently conducted desktop analyses by reviewing current regional literature and accessing agency internet biological databases and resources, such as the California Natural Diversity Database (CNDDB), the Nevada Natural Heritage Program (NNHP) database, and California Department of Fish and Game (CDFG), Nevada Division of Environmental Protection, National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and BLM internet resources. Regional review was defined by the natural geographic boundaries in which the proposed project area is present, as described in Section 3.4.1, above.

Field surveys were conducted in 2008~~ and~~, 2009, and 2010 for most of the project areas and in buffer zones of varying width around existing and proposed project facilities.~~ New access and spur roads as identified by the applicant will be surveyed during spring 2010~~. Reconnaissance surveys were performed along 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. The following were also surveyed:

- Transmission Line Alternative Routes A and B near the Eldorado Substation, and Alternatives C and D and Subalternative E near Primm, Nevada;
- The Nipton 33-kV/Earth 12-kV line from the Mountain Pass Substation south to an existing AT&T microwave site;
- The proposed fiber optic route along the existing Eldorado–Lugo transmission line from the Eldorado Substation south to Nipton; and
- The Nipton 33-kV line between Nipton and the point where the Nipton 33-kV line crosses I-15
- The Nipton 33-kV line from the point where the Nipton 33-kV line crosses I-15 east to Mountain Pass Substation; and
- The Nipton 33-kV line from the point where the Nipton 33-kV line crosses I-15 north along I-15 to the Ivanpah Substation.

During field surveys, biological resources were assessed within a 250-foot-wide corridor along the transmission lines. The purpose of reconnaissance surveys was to identify vegetation communities and wildlife~~ present~~ presence, to conduct preliminary searches for sensitive plant and wildlife species in suitable habitats within the project limits (including nests for raptors), and to identify areas that required additional protocol-level surveys for sensitive species. Protocol surveys provide specific location information on sensitive species occurrences within project limits. Focused surveys conducted included USFWS protocol-level presence/absence surveys (including zones of influence) for the Mojave population of desert tortoise and surveys for rare plants and invasive/noxious weed species.

Protocol-level surveys for desert tortoise were conducted in spring 2008 and 2009 along the proposed transmission line route between the Eldorado Substation and the Mountain Pass Substation, all transmission alternative routes, the proposed telecommunications lines and all alternatives, and the proposed microwave tower site near the town of Nipton. ~~Because of the more limited potential impacts associated with placement of the fiber optic communications line along existing transmission and distribution lines~~ ~~(~~Along the Eldorado–Lugo 500-kV and Nipton 33-kV~~, respectively)~~ lines, protocol surveys were ~~not performed for the entire telecommunication route but focused~~ only conducted on areas of ground disturbance associated with cable pulling and tensioning sites, tower retrofit construction areas, and other construction areas. Tower pads ~~and spur roads associated with~~ located along the existing Eldorado–Lugo transmission line (route for the proposed fiber optic line, Path 2, Sections 1 and 2) were surveyed. ~~Access roads along the Eldorado–Lugo line were not surveyed. The USFWS service has agreed that data collected for the 100-foot-buffered tower sites and the spur roads on the Eldorado–Lugo transmission route can be used for estimating desert tortoise densities along these access roads (Burroughs 2009). The applicant plans to complete additional desert tortoise surveys in spring 2010. For the proposed transmission line route and alternatives, biologists surveyed a 200-foot ROW, plus five zone-of-influence transects on each side.~~ In spring 2010 additional protocol-level surveys for desert tortoise were conducted along proposed portions of the project that were not surveyed during the 2008 and 2009 surveys. During the spring 2010 survey effort, all access roads and non-linear features (pulling /splicing sites, helicopter landing zones, and proposed laydown areas) were surveyed to ensure 100 percent coverage; additionally, five zone-of-influence transects were surveyed on each side of the roads. Results of the 2008 desert tortoise surveys are provided in the Desert Tortoise Survey Report (Karl 2009), an appendix to the Eldorado-Ivanpah Transmission Project Biological Technical Report (EPG 2009). Results of the 2009 desert tortoise surveys are provided in the ~~DRAFT~~ Desert Tortoise Survey Report (Karl 2010a) and the results of the 2010 desert tortoise surveys are provided in the Desert Tortoise Survey Report (Karl 2010b), in Appendix B-2 of this document.

A rare plant and invasive/noxious weed survey was conducted by first developing target species lists after consulting lists of federally and state-listed species and similar species lists maintained by the California Native Plant Society (CNPS), the CNDDB, the NNHP, the Nevada Native Plant Society (NNPS), and the California and Nevada offices of the BLM. Field surveys for rare plants were conducted in 2008 along the proposed route and in most project areas; however, some areas were not covered, including some alternative routes and existing substation facilities. Field surveys were conducted in 2009 for project transmission and telecommunication alternative routes not identified in 2008. Additionally, the Ivanpah Dry Lake playa and disturbed ground areas and paved roads and parking lots near Primm, Nevada, were not surveyed due to lack of suitable habitat. ~~Additional surveys for rare plants will be completed by the applicant in spring 2010~~. An invasive/noxious weed survey was performed along the proposed project route from the existing Eldorado Substation to the proposed Ivanpah Substation site, extending west along the fiber optic communications route to the Mountain Pass Substation. Additional botanical surveys were conducted during the spring of 2010 including surveys for rare plants, invasive/noxious weeds, and cactus and yucca (see Appendix B-3). Surveys were conducted around each existing and proposed tower site, proposed disturbance areas used for pulling sites, laydown areas, and for telecommunication infrastructure. Although cactus and yucca surveys were conducted in both California and Nevada, counts were calculated for the Nevada portion of the proposed project at the request of the Nevada BLM field office.

A raptor and raptor nest survey was conducted during the winter of 2009 and spring of 2010. The raptor survey was conducted along the proposed transmission line route between the Eldorado Substation and Primm, Nevada, the proposed telecommunications line between Eldorado Substation and Nevada State Route 164, the vicinity of the Mountain Pass Substation, and the McCullough Pass area (two to three kilometers south of the proposed transmission line route). Biologists visually surveyed for raptors on or near the transmission structures for the proposed transmission and communication lines as well as adjacent lines, and for any evidence of nesting in the transmission structures or nearby cliffs (see Appendix B-4).

A delineation of the waters of the United States (U.S.) and CDFG Jurisdictional Aquatic Resources was conducted during spring 2010 (see Appendix B-5). The data that was collected is intended to assist the U.S. Army Corps of Engineers (USACE) in its determination of the extent of jurisdictional Waters of the U.S. within the proposed project area. The data is also intended to aid the CDFG with determination of the extent of jurisdictional habitats in the California portion of the proposed project. Biologists surveyed all project-related temporary and permanent impact areas including a 50-foot buffer surrounding all impact areas and access roads except for Alternative B, the California portion of Alternative D, the spur roads between the Eldorado-Lugo main access road and the existing transmission towers, and the Mountain Pass and Golf Course telecommunication alternatives for desert washes potentially falling under the regulatory jurisdiction of USACE and CDFG. Data was collected in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and additional supplemental manuals. For the evaluation of desert washes located along areas not physically surveyed, (i.e. Alternative B, etc), identification was based on United States

Geological Survey (USGS) topographical maps and National Hydrography Datasets (NHD). For the purposes of analysis, all blue-line drainages intersected by the project and alternatives that were not physically surveyed are assumed to be jurisdictional to the USACE and the CDFG.

Survey results for both 2008 and 2009 reconnaissance and protocol-level surveys are provided in the Eldorado–Ivanpah Transmission Project Biological Technical Report (EPG 2009). Table 3.4-1 outlines the ~~schedule for additional biological surveys~~ pre-construction surveys to be performed by the applicant should the project be permitted. ~~Pre-construction surveys are also outlined in Table 3.4-1, as these~~. These surveys will be necessary to verify that the construction area is cleared of sensitive biological resources from 1 to 30 days prior to construction. Though additional biological surveys still need to be completed as outlined in Table 3.4-1, Council on Environmental Quality (CEQ) regulations (Title 40 of the Code of Federal Regulations [CFR], Section [§] 1502.22) allow the analysis within an environmental document to proceed with incomplete data, particularly if the available information is sufficient to determine the potential for impacts. As biological resources can move into project boundaries after initial surveys have been conducted, pre-construction surveys identify the current status of biological resources within project boundaries and allow for appropriate management if any sensitive ~~organisms~~ resources are found.

Table 3.4-1 Additional Biological Surveys to be Completed

Survey	Survey Area	Survey Schedule	Notes
Bighorn sheep	McCullough ~~Pass~~ Range, Highland Pass between Highland Range and ~~South McCullough Mountains~~, Mountain Pass Substation area	~~December through May, if construction is to occur in bighorn sheep areas during the January through May lambing season~~. Preconstruction survey for desert bighorn sheep within suitable bighorn sheep habitat within 1 week prior to construction activities in the McCullough Range and the southern portion of the Eldorado Valley between the Highland Range and the Southern McCullough Range.	~~Surveys conducted if bighorn lambing areas cannot be avoided during lambing season (January–May)~~. Conduct biological monitoring by a qualified biologist for desert bighorn sheep during duration of construction within suitable bighorn sheep habitat.
Burrowing owl	All project areas with suitable burrowing owl habitat: scrublands, sparse shrublands, and grasslands with low vegetation height. Presence of burrows made by fossorial mammals or manufactured structures such as culverts and drains.	~~Habitat assessment to be conducted during migratory bird survey and preconstruction surveys~~. Preconstruction surveys to be conducted in all areas with suitable habitat.	
Desert tortoise	~~Project areas not previously surveyed, including access and spur roads~~ All project areas	~~May 2010 and preconstruction~~ Preconstruction clearance surveys	~~Protocol-level surveys with zone of influence have been conducted for the majority of proposed project and alternatives during the 2008 and 2009 spring survey season~~
~~Jurisdictional delineation~~ Migratory birds	All project areas	~~Jan 2010~~ Preconstruction surveys (February–August)	~~Project area to be surveyed for washes/other areas that will require water permits~~
~~Migratory birds~~ Raptors nests	All project areas	~~February/March 2010 and~~ preconstruction surveys (February~~–~~-August)	
~~Raptors and raptor nests~~ Rare plants	~~McCullough Pass, Eldorado–Lugo 500-kV line between Highland Range and South McCullough Mountains, Mountain Pass Substation area.~~ All project areas	~~December 2009, March 2010, and preconstruction surveys~~ Preconstruction surveys	~~Surveys for these areas to include the surrounding cliffs; surveys conducted during the spring, preferably March~~

Table 3.4-1 Additional Biological Surveys to be Completed

Survey	Survey Area	Survey Schedule	Notes
~~Rare plants~~ Other Special Status Wildlife	All project areas	~~Winter/spring 2009–2010; timing depends on growing conditions~~ Preconstruction surveys, all year	~~The majority of project areas were surveyed during the 2008 and 2009 rare plant surveys~~
~~Wildlife~~	~~All project areas~~	~~Preconstruction surveys, all year~~	

Plant Communities

Habitat types within the proposed project area are typical of those found in the Mojave Desert (Figure 3.4-1). Vegetation at lower elevations over most of the EITP is characteristic of the creosote bush-white bursage (*a ea t i entata*- *b osia osa*) series (Sawyer and Keeler-Wolf 1995). Other specific vegetation types include saltbush (*t iple* spp.) scrub, Mojave yucca (*a s hi ige a*) desert scrub, Joshua tree (*a b e ifolia*) woodland, black bush (*oleogyne a osissi a*) scrub, desert wash, and ~~pinion~~, for the Mountain Pass Alternative only, pinyon pine-juniper (*in s onophyla*- *nipe s alifo ni a*) woodland. In addition, areas relatively devoid of native vegetation include the dry lake beds, developed areas, paved roads, highways, and access roads and other disturbed areas associated with construction and ongoing mining operations.

Saltbush Scrub

Saltbush scrub typically has low plant species diversity, and within the proposed project area is dominated by saltbush species, white bursage, and big galleta (*le aphis igi a*) 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 is dominated by creosote bush and augmented by a variety of other shrubs, including four-wing saltbush (*t iple anes ens*), all-scale (*poly a pa*), desert senna (*enna a ata*), cheesebush (*y eno lea salsola*), sweetbush (*ebbia n ea*), and other less common shrubs. Numerous annual plants and forbs are present to varying degrees, including pincushion flower (*haena tis f e ontii*), bristly fiddleneck (*sin kia tessellate*), desert globemallow (*phae al ea a big a*), cryptantha (*yptantha* sp.), combseed (*e to a ya* sp.), and Mediterranean grass (*his s ba bat s*). 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 (*ylin op ntia e hino a pa*), Engelmann's hedgehog cactus (*hino e e s engel annii*), California barrel cactus (*e o a t s ylin a e s*), diamond cholla (*ylin op ntia a osissi a*), and beavertail pricklypear (*p ntia basila is*).

Mojave Yucca Desert Scrub

Mojave yucca is the dominant over-story plant in this community, which is a common transitional community 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 (*hino e e s poly ephal s*), Wiggins' and diamond chollas, Engelmann's hedgehog cactus, and beavertail pricklypear. Shrub species include Virgin River brittlebush (*n elia i ginensis*), as well as white bursage at the lower elevation limits of the plant community and black bush at the upper limits.

Joshua Tree Woodland

Joshua tree woodland occurs at middle elevations in the proposed project area. Joshua tree woodland is dominated by Joshua trees as the overstory plant with Mojave yucca, ephedras (*phe a* sp.), cheesebush, California buckwheat (*iogon fas i lat*), and wolfberry (*y i an e sonii*) present as common shrub species. Creosote bush and black bush typically occur at ecotonal boundaries with lower and higher elevation adjacent plant communities, respectively.

Black Bush Scrub

The black bush scrub plant community, typical of mid-elevation desert mountains, is dominated by black bush and features emergent (i.e., growth above the level of the standing canopy) Utah juniper (*nipe s osteospe a*), single leaf pinyon (*in s onophylla*), and numerous shrub species including ephedra, annuals, and perennial plants, including turpentine broom (*Tha nos a ontana*), goldenbush (*i a e ia* sp.), Mexican bladder sage (*ala a ia e i ana*), desert lupine (*pin s sho kleyi*), freckled milkvetch (*st agal s lentiginos s*), and desert paintbrush (*astille a ang stifolia*). Black bush scrub intergrades with creosote bush scrub at lower elevations and Joshua tree woodland at higher elevations.

Desert Wash Habitat (Catclaw Acacia Series)

Vegetation present within the numerous desert washes in the proposed project area includes widely scattered catclaw acacia (*a ia g eggii*) and, more commonly, ephedra, cheesebush, and sweetbush. Mesquite mistletoe (*ho a en on alifo ni*) occurs in some of the catclaw acacia in wash areas. Vegetation along canyon bottoms and washes in the McCullough Range is shrub-dominated, with no emergent tree species. Shrubs present include catclaw acacia, wolfberry, California trixis (*T i is alifo ni a*), Virgin River brittlebush, and California buckwheat. The vegetation in the majority of these smaller washes at lower elevations does not dramatically differ from the vegetation community of the adjacent interfluvial areas.

Pinyon Pine-Juniper Woodland

Pinyon pine and juniper woodlands consist of scattered trees between 10 and 50 feet tall, and generally occur at elevations above Joshua tree woodland and in environments more mesic than those that support Joshua tree woodland. In Mojave Desert regions of California and Nevada within the EITP, the dominant species are single-leaf pinyon and California juniper. Other species found in association with these dominants include Joshua tree, various desert scrub oaks (*e s t binell o ohn t ke i*), blackbrush, Mormon-tea (*phe a i i is* , burrobush (*y eno lea salsola*), wolfberry, and snakeweed (*tie e ia sp* This vegetation type occurs at the higher elevations in the Clark Mountain Range along the Mountain Pass Alternative between the Ivanpah Substation and the Mountain Pass Substation.

Summary of Plant Communities by Proposed Project Area

A complete list of plants observed within the EITP area is found in the Eldorado-Ivanpah Transmission Project Biological Technical Report (EPG 2009).

The proposed and alternative transmission line routes would be located primarily within creosote bush-white bursage vegetation, with the exception of the McCullough Range north pass, which includes desert wash vegetation, and the areas immediately adjacent to Ivanpah Dry Lake, which are dominated by saltbush scrub. Vegetation varies depending on elevation and disturbance factors.

The following vegetation description begins at the northern end (milepost [MP] 0) of the proposed transmission line ROW and moves south toward the Ivanpah Substation (MP 35) and the existing Mountain Pass Substation. The Eldorado Substation is at an elevation of approximately 1,800 feet in the flat Eldorado Valley. Vegetation in the vicinity of the Eldorado Substation is dominated by the creosote bush-white bursage series, and occurs on flat, sandy soils with numerous small washes. From the Eldorado Substation to the McCullough Range, the creosote bush-white bursage vegetation is augmented by a variety of shrubs and annual forbs. Cacti are not common here, but a few species of cacti are present.

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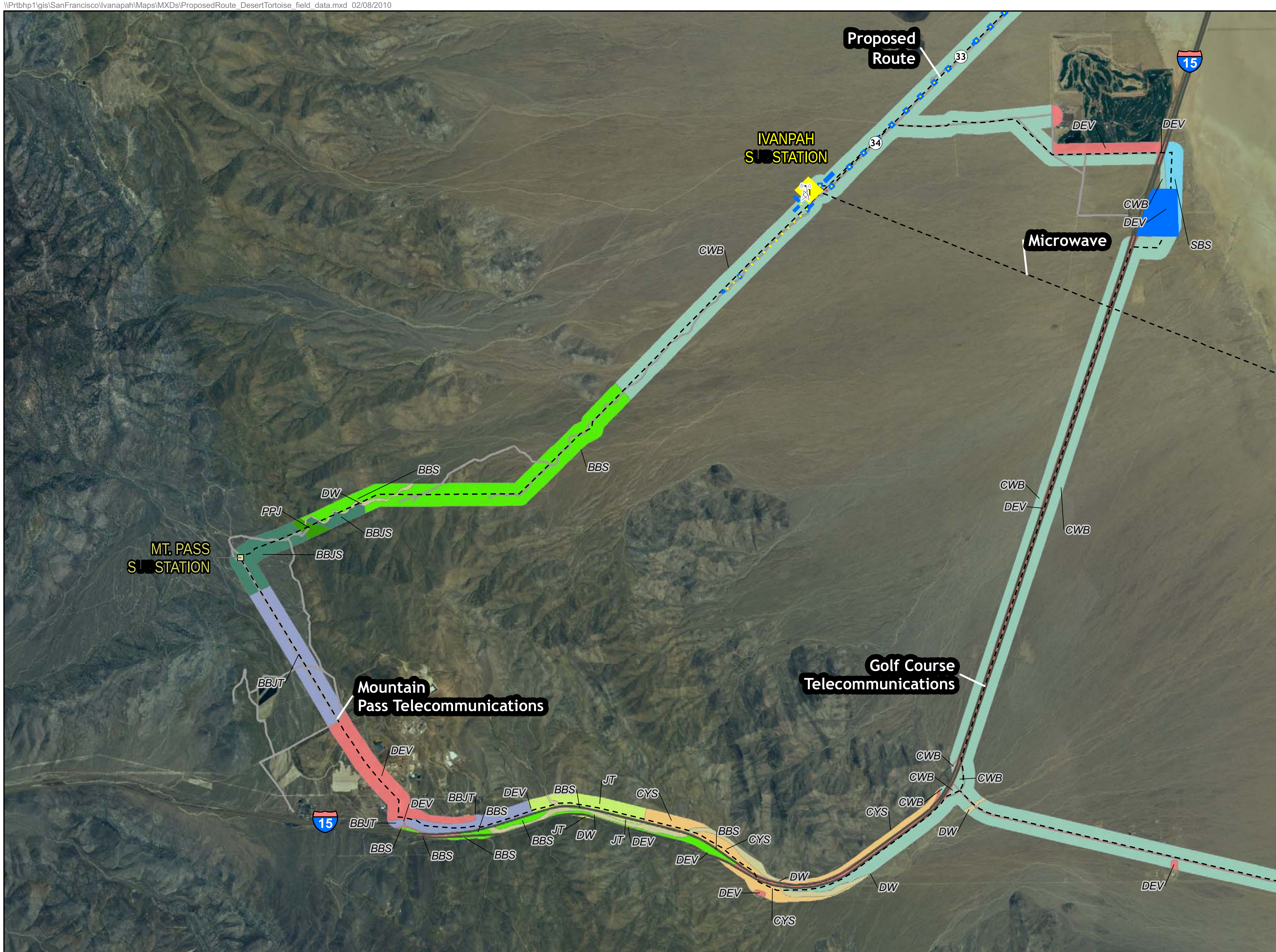

Figure 3.4-1a
Eldorado-Ivanpah Transmission Project
Vegetation

- Milepost
- Route Options
- Proposed Microwave Tower
- Proposed Substation
- Existing Substation
- Permanent Distrubance
- Temporary Disturbance
- New Spur/Access Road
- Existing Spur/Access Road

Ve et tio

- Joshua Tree Woodland (JT)
- Black Bush Scrub (BBS)
- Black Bush Scrub-Jashua Tree (BBJT)
- Black Bush-Juniper Scrub (BBJS)
- Creosote Scrub (CS)
- Creosote-White Bursage Scrub (CWB)
- Creosote-Yucca Scrub (CYS)
- Desert Wash (DW)
- Developed (DEV)
- Distrubed (DST)
- Distrubed Creosote Scrub (DCS)
- Dry Lake Bed (DLB)
- Pinon Pine-Juniper (PPJ)
- Saltbush Scrub (SBS)

N

0 0.5 1
Miles

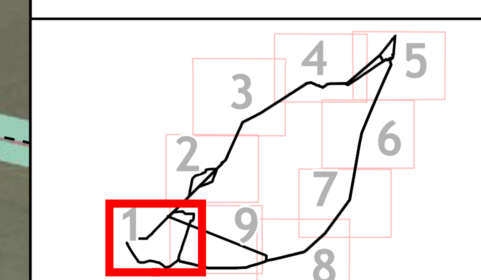

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Figure 3.4-1b
Eldorado-Ivanpah Transmission Project

Vegetation

Milepost
Route Options
Proposed Microwave Tower
Proposed Substation
Existing Substation
Permanent Distrubance
Temporary Disturbance
New Spur/Access Road
Existing Spur/Access Road

Ve et tio

Joshua Tree Woodland (JT)
Black Bush Scrub (BBS)
Black Bush Scrub-Jashua Tree (BBJT)
Black Bush-Juniper Scrub (BBJS)
Creosote Scrub (CS)
Creosote-White Bursage Scrub (CWB)
Creosote-Yucca Scrub (CYS)
Desert Wash (DW)
Developed (DEV)
Distrubed (DST)
Distrubed Creosote Scrub (DCS)
Dry Lake Bed (DLB)
Pinon Pine-Juniper (PPJ)
Saltbush Scrub (SBS)

N

0 0.5 1

Miles

1 2 3 4 5 6 7 8 9

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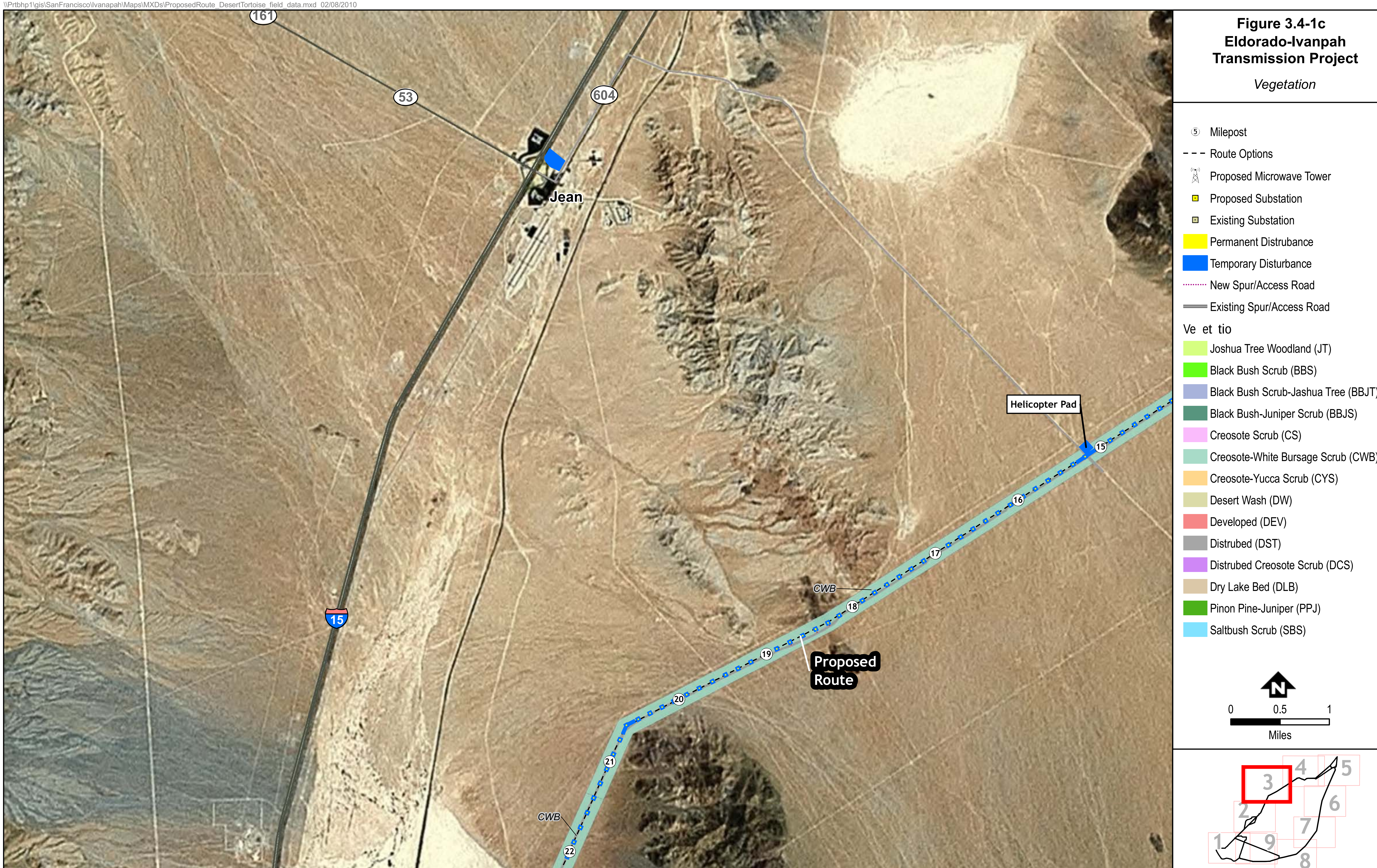

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Figure 3.4-1d
Eldorado-Ivanpah Transmission Project

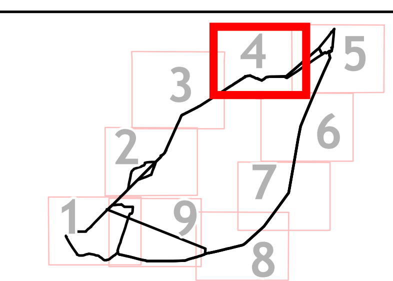
Vegetation

Milepost
Route Options
Proposed Microwave Tower
Proposed Substation
Existing Substation
Permanent Distrubance
Temporary Disturbance
New Spur/Access Road
Existing Spur/Access Road

Ve et tio

Joshua Tree Woodland (JT)
Black Bush Scrub (BBS)
Black Bush Scrub-Jashua Tree (BBJT)
Black Bush-Juniper Scrub (BBJS)
Creosote Scrub (CS)
Creosote-White Bursage Scrub (CWB)
Creosote-Yucca Scrub (CYS)
Desert Wash (DW)
Developed (DEV)
Distrubed (DST)
Distrubed Creosote Scrub (DCS)
Dry Lake Bed (DLB)
Pinon Pine-Juniper (PPJ)
Saltbush Scrub (SBS)

N
0 0.5 1
Miles



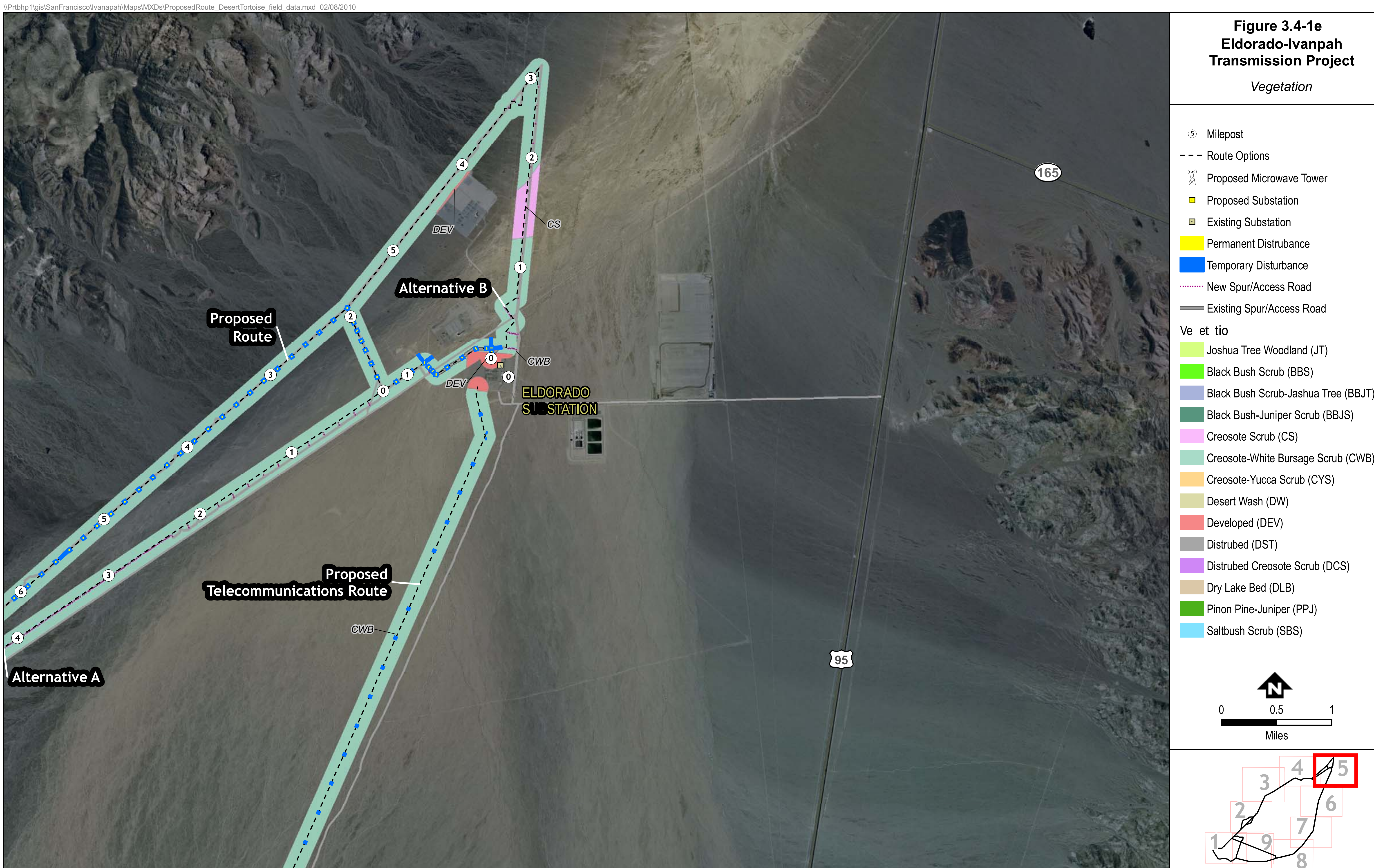


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Figure 3.4-1e
Eldorado-Ivanpah Transmission Project
Vegetation
Milepost
Route Options
Proposed Microwave Tower
Proposed Substation
Existing Substation
Permanent Distrubance
Temporary Disturbance
New Spur/Access Road
Existing Spur/Access Road
Ve et tio
Joshua Tree Woodland (JT)
Black Bush Scrub (BBS)
Black Bush Scrub-Jashua Tree (BBJT)
Black Bush-Juniper Scrub (BBJS)
Creosote Scrub (CS)
Creosote-White Bursage Scrub (CWB)
Creosote-Yucca Scrub (CYS)
Desert Wash (DW)
Developed (DEV)
Distrubed (DST)
Distrubed Creosote Scrub (DCS)
Dry Lake Bed (DLB)
Pinon Pine-Juniper (PPJ)
Saltbush Scrub (SBS)
N
0 0.5 1
Miles
Alternative B
Proposed Route
Proposed Telecommunications Route
Alternative A
ELDORADO SUBSTATION
CS
DEV
CWB
165
95

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Figure 3.4-1f
Eldorado-Ivanpah Transmission Project
Vegetation

Figure 3.4-1g
Eldorado-Ivanpah Transmission Project

Vegetation

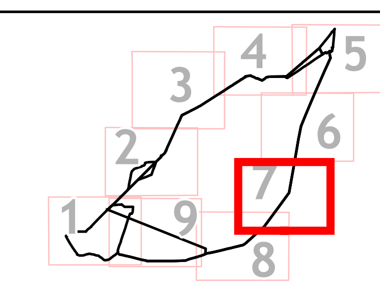

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Figure 3.4-1h
Eldorado-Ivanpah Transmission Project
Vegetation

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~~Creosote bush and black bush typically occur at ecotonal boundaries with lower and higher elevation adjacent plant communities, respectively.~~

~~Black Bush Scrub~~

~~The black bush scrub plant community, typical of mid-elevation desert mountains, is dominated by black bush and features emergent (i.e., growth above the level of the standing canopy) Utah juniper (*nipe s osteospe a*), single leaf pinion (*in s onophylla*), and numerous shrub species including ephedra, annuals, and perennial plants, including turpentine broom (*Tha nos a ontana*), goldenbush (*i a e ia* sp.), Mexican bladder sage (*ala a ia e i ana*), desert lupine (*pin s sho kleyi*), freckled milkvetch (*st agal s lentiginos s*), and desert paintbrush (*astille a ang stifolia*). Black bush scrub intergrades with creosote bush scrub at lower elevations and Joshua tree woodland at higher elevations.~~

~~Desert Wash Habitat (Catclaw Acacia Series)~~

~~Vegetation present within the numerous desert washes in the proposed project area includes widely scattered catclaw acacia (*a ia g eggii*) and, more commonly, ephedra, cheesebush, and sweetbush. Mesquite mistletoe (*ho a en on alifo ni*) 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 (*T i is alifo ni a*), Virgin River brittlebush, and California buckwheat.~~

~~Pinion Pine-Juniper Woodland~~

~~Pinion pine and juniper woodlands consist of scattered trees between 10 and 50 feet tall, and generally occur at elevations above Joshua tree woodland and in environments more mesic than those that support Joshua tree woodland. For the proposed project, this vegetation type occurs at the higher elevations in the Clark Mountains. In Mojave Desert regions of California and Nevada within the EITP, the dominant species are single-leaf pinion and California juniper. Other species found in association with these dominants include Joshua tree, various desert scrub oaks (*e s t binell o ohn t ke i*), blackbrush, Mormon-tea (*phe a i i is* , burrobush (*y eno lea salsola*), wolfberry, and snakeweed (*tie e ia sp*~~

~~Summary of Plant Communities by Proposed Project Area~~

~~A complete list of plants observed within the EITP area is found in the Eldorado-Ivanpah Transmission Project Biological Technical Report (EPG 2009).~~

~~The proposed and alternative transmission line routes would be located primarily within creosote bush-white bursage vegetation, with the exception of the McCullough Mountains north pass, which includes desert wash vegetation, and the areas immediately adjacent to Ivanpah Dry Lake, which are dominated by saltbush scrub. Vegetation varies depending on elevation and disturbance factors.~~

~~This description begins at the northern end (milepost [MP] 0) of the proposed transmission line ROW and moves south toward the Ivanpah Substation (MP 35) and the existing Mountain Pass Substation. The Eldorado Substation is at an elevation of approximately 1,800 feet in the flat Eldorado Valley. Vegetation in the vicinity of the Eldorado Substation is dominated by the creosote bush-white bursage series, and occurs on flat, sandy soils with numerous small washes. From the Eldorado Substation to the McCullough Mountains, the creosote bush-white bursage vegetation is augmented by a variety of shrubs and annual forbs. Cacti are not common here, but a few species of cacti are present.~~

The desert wash vegetation in the McCullough ~~Mountains~~ Range is shrub-dominated, supporting widely scattered catclaw acacia and ephedra. The canyon bottoms and washes of the McCullough ~~Mountains~~ Range in the transmission route area are treeless. The mountain slopes do support a wider diversity of cacti, subshrubs, and forbs than does the Eldorado Valley. Soils along this portion of the transmission route are generally sandy, with some rock- and cobble-dominated areas. The McCullough ~~Mountains~~ Range ranges from 2,300 feet elevation on the lower slopes to 3,370 feet at the top. These mountains are rugged, with deeply incised canyons and frequent cliff faces. West of the McCullough ~~Mountains~~ Range, the transmission line descends from approximately 3,200 feet into the Jean Valley and the eastern Ivanpah Valley, which has an elevation of approximately 2,600 feet. Here the transmission line ROW is located on broad, sandy alluvial fans where the creosote bush-white bursage community is augmented by all-scale and big galleta. Yuccas, chollas, and cacti are also present here. The line then passes Roach Lake and continues to Primm, Nevada, where it traverses the Ivanpah Dry Lake playa and heads into the Clark ~~Mountains~~ Mountain Range. Both Roach and Ivanpah lakes are devoid of vegetation, and the areas immediately bordering the lakes are saltbush scrub.

West of the Ivanpah playa, the vegetation again becomes dominated by the creosote bush-white bursage series, which gives way to a distinctive black bush series as the line ascends into the Clark Mountain~~s~~ Range toward Mountain Pass Substation. The area around the Mountain Pass Substation, with an elevation of approximately 5,320 feet, is in black bush series habitat, with Utah juniper an important element of the plant community. In the Mountain Pass area, species of yucca (*ba ata*, *b e ifolia*, and *s hi ige a*) are common but not abundant, and several species of cacti, including prickly pear species (*p ntia* spp.), chollas, and others, are present. In addition, the approach to the Mountain Pass Substation from the east supports scattered single-leaf ~~pinion~~ pinyon pine.

The Eldorado–Lugo Telecommunication Line would traverse habitats dominated by creosote bush scrub, Mojave desert scrub, Joshua tree woodland, and black bush scrub, and would cross areas with desert wash habitat. Again, this description moves north from the Eldorado Substation south to Nipton and I-15. South of the Eldorado Substation, elevation gradually increases in the South McCullough ~~Mountains~~ Range, and vegetation density and diversity increase from the pure creosote bush-white bursage scrub to include more shrubby vegetation. Cacti species are few, desert washes are present with catclaw acacia, and at higher elevations around 3,200 feet, Joshua trees begin to become prominent. Black bush appears around 4,500 feet. Once the line descends to the Ivanpah Valley, the vegetation transitions back to Mojave desert scrub habitat. The Nipton 33-kV telecommunication route and alternatives between Nipton, California, and I-15 are located within creosote bush scrub and cross saltbush scrub on the southern end of the Ivanpah Dry Lake bed. Table 3.4-2 lists vegetation types within the proposed project area and provides estimates of temporary and permanent disturbance from the project to vegetation.

Table 3.4-2 Acreage of Project-Related Disturbance for Vegetation Communities within the EITP

Vegetation Type [1]	Acreage in EITP Area	Approximate Temporary Disturbance[2] (% of Total Acreage)	Approximate Permanent Disturbance[3] (% of Total Acreage)
Black bush scrub	1.36	1.36 (0.4)	0 (0)
Black bush scrub-Joshua tree woodland	8.43	8.43 (2.6)	0 (0)
Creosote scrub	29.57	22.80 (7.2)	6.77 (12.3)
Disturbed creosote scrub	1.23	1.10 (0.35)	0.13 (0.2)
Creosote-white bursage scrub	242.58	199.28 (63)	43.30 (78.9)
Desert wash	5.09	3.90 (1.2)	1.19 (2.2)
Saltbush scrub	13.54	12.79 (4.0)	0.75 (1.4)
Developed (urban/impervious)	53.13	52.39 (16.5)	0.74 (1.4)
Disturbed (bare ground)	5.31	5.26 (1.7)	0.05 (0.1)
Dry lake bed	12.13	10.19 (3.21)	1.94 (3.6)
~~Pinion pine-juniper woodland~~	~~DNP~~	~~NA~~	~~NA~~

Table 3.4-2 Acreage of Project-Related Disturbance for Vegetation Communities within the EITP

Vegetation Type [1]	Acreage in EITP Area	Approximate Temporary Disturbance[2] (% of Total Acreage)	Approximate Permanent Disturbance[3] (% of Total Acreage)
Undetermined (Not provided by applicant at the time of publication)	443.28	384.53	58.75
Totals			

Notes:
[1] Pinyon-pine woodland is only found in the Mountain Pass Alternative and not in the proposed project area; thus, this vegetation type is not addressed in this table.
[2] Temporary impacts from: Laydown areas, OPGW areas, Tower construction areas, Helicopter pads, Pulling sites for the 115-kV line, Tensioning sites, Splicing areas
[3] Permanent impacts from: Tower clearance areas, New spur roads, Ivanpah Substation

Key:
kV = kilovolt
NA = not applicable
OPGW = optical ground wire

Noxious and Invasive Weeds

Noxious weeds are species of non-native plants included on the weed lists of the U.S. Department of Agriculture (USDA; USDA 2009a) or the California Invasive Plant Council (CIPC; CIPC 2006), Nevada State Department of Agriculture (2005) and those weeds of special concern identified by the BLM. Noxious weeds are a concern due to their potential to cause permanent damage to natural plant communities directly via competition or indirectly through alteration of the natural fire regime. ~~No high concentrations of noxious weeds were observed anywhere along the project ROW.~~

Noxious weeds encountered during the surveys included ~~nine~~ twelve species within the California segment of the project and ~~eight~~ nine within the Nevada segment (Table 3.4-3).~~[4]~~ Compact brome (*o s a itensis* var. *bens*), cheatgrass (*o s te to*), redstem stork's bill (*o i i ta i*), African mustard (*al ol ia af i ana*), prickly Russian thistle (*alsola t ag s*), common Mediterranean grass, London rocket (*isy b i i io*), and saltcedar (*Ta a i a osissi a*) were common to both California and Nevada segments. Wild oat (*ena fat a*), ~~cheatgrass (*o s te to*),~~ and Chilean chess (*t inii*), Asian mustard (*assi a to nefo tii*), and crossflower (*ho ispo a tenella*) were found only on the California segment of the project, and Bermudagrass (*yno on a tylon*) ~~and London rocket (*isy b i i io*)~~ were unique to the Nevada segment. ~~Asian mustard (*assi a to nefo tii*) was reported to be present on the adjacent proposed ISEGS plant site (CEC and BLM 2009) and, while not directly observed during the survey, is likely to be present within the proposed project area.~~ While Asian mustard was not directly observed within the Nevada segment during the surveys, it is likely to be present within the Nevada proposed project area. During the 2010 botanical survey there were three primary areas of noxious and invasive weed concentration along the proposed transmission line. These areas occur between MPs 0 to 1 (densest concentration observed; associated with Eldorado Substation), between MPs 22 to 23 (associated with Roach Lake), and between MPs 27 to 29 (associated with the town of Primm and Ivanpah Lake). Several plants listed below (*o i* spp , *o s* spp., and *his s* spp.) are widespread throughout the region and are difficult to control, while others, such as mustard, thistle, and *Ta a i* spp., can be successfully controlled and will continue to spread if not.

~~[4] NOTE: Data gap. BLM has indicated that the applicant should identify hot spot locations within the project area where these species are located in order to properly implement invasive management.~~

Table 3.4-3 Noxious and Invasive Weed Species Documented in the EITP

Common Name	Scientific Name	California Invasive Plant Inventory Invasiveness Rating	Control	Project Segment
Wild oat	*ena fat a*	Moderate	Control	CA
Asian mustard	*assi a to nefo tii*	High	Eradicate	CA ~~& NV~~
Compact brome	*o s a itensis* var. *bens*	High	Not feasible	CA & NV
Cheatgrass	*o s te to*	High	Not feasible	CA & NV
Chilean chess	*o s t inii*	Not rated*	Not rated*	CA
Crossflower	*ho ispo a tenella*	Not rated*	Not rated*	CA
Bermudagrass	*yno on a tylon*	Moderate	Control	NV
Redstem stork's bill	*o i i ta i*	Limited	Not feasible	CA & NV
African mustard	*al ol ia af i ana*	Not rated*	Not rated*	CA & NV
Russian thistle	*alsola t ag s*	Limited	Eradicate	CA & NV
Mediterranean grass	*his s ba bat s*	Limited	Not feasible	CA & NV
London rocket	*ysi b i i io*	Moderate	Control	CA & NV
Saltcedar	*Ta a i a osissi a*	High	Eradicate	CA & NV

Notes:
*USDA listing as invasive, not rated.
California Invasive Plant Inventory Invasiveness Rating:
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.
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 generally depends on 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.

~~Drainages/Riparian Areas~~[2]

~~Ivanpah and Roach lakes are crossed by the proposed project and/or the alternatives, and Jean and Eldorado lakes lie adjacent to the project. Numerous washes and drainages are crossed by the project facilities. In the Eldorado Substation area, the desert washes are generally small and support shrub-dominated vegetation. The existing access road for the northern McCullough Pass area follows an alluvial fan and desert wash up through the canyon. West of the McCullough Mountains where the transmission line descends into the Jean Valley and the eastern Ivanpah Valley, the transmission line ROW crosses numerous small to relatively large dry washes that flow out of the McCullough Mountains. West of Ivanpah Dry Lake, the existing ROW crosses both small and broad washes as the transmission line heads up to Mountain Pass. Numerous washes are also present along the telecommunication route that runs from Eldorado Substation down to Nipton and into the Ivanpah Valley south of Ivanpah Dry Lake. The proposed telecommunications line just north of Nipton lies within the vicinity of Big Tiger Wash, a larger drainage between the southern McCullough and the New York mountains.~~

~~The specific condition of these desert drainages has not been determined; a jurisdictional delineation will be conducted in early spring 2010 by the applicant. The delineation will document drainage characteristics (including riparian vegetation presence) and determine jurisdictional extents based on the U.S. Army Corps of Engineers (USACE) and the CDFG codes and regulations. It will also determine whether any wetlands exist within the proposed project area.~~

~~2 NOTE: Lack of delineation is a significant data gap. This document is incomplete without this information from SCE as impact analysis cannot be conducted.~~

Drainages/Riparian Areas

The project traverses five watersheds in California and Nevada including tributaries of Ivanpah Lake (California, Nevada), Roach Lake (Nevada), Jean Lake (Nevada), Eldorado Valley Dry Lake (Nevada), and Piute Wash (Nevada), a tributary to the Colorado River. Table 3.4-4 outlines the potential federal jurisdictional waters by watershed that are crossed by the project facilities. Two general types of features qualifying as Waters of the United States occur within the project area: dry lake beds and ephemeral desert washes. Ivanpah Lake is a playa lake that is dry for most of the year and is the only dry lake bed in the project area considered jurisdictional by USACE. The portion of Ivanpah Dry Lake that is crossed by the proposed transmission line is composed of historic lake deposits that are very poorly drained, leading to ponding following sufficient rain events. The project is dissected by numerous ephemeral desert washes and drainage channels supporting numerous vegetation communities. About a quarter of the mapped potentially jurisdictional washes have sandy or gravelly un-vegetated channel bottoms, and banks with vegetation that are not distinct from the surrounding creosote brush scrub. Washes near the margins of Roach Lake typically have sandy bottoms and support saltbush scrub. Along the telecommunications route within the watershed north-west of Highway 164 that drains to Piute Wash, the margins of many of the mapped drainages and occasionally the channel bottoms are dominated by Joshua tree woodlands. Other systems within this area have channels dominated by species more characteristic of active channels such as catclaw acacia, desert almond, and wooly bursage. Several highly degraded drainages that cross the state line near Primm, Nevada, are dominated by non-native species such as tamarisk and Russian thistle.

Table 3.4-4 Summary of the Potential USACE Jurisdiction by Watershed within the EITP

Watershed	USACE Status	Section 404 Rational
Ivanpah Lake - Interstate tributaries	Jurisdictional	Interstate waters
Ivanpah Lake Playa	Jurisdictional	Nexus to interstate or foreign commerce
Piute Wash tributaries	Jurisdictional	Nexus to Traditional Navigable Water
Roach Lake tributaries	Jurisdictional	Nexus to interstate or foreign commerce
Eldorado Valley Dry Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce
Ivanpah Lake intrastate tributaries	Non-Jurisdictional	Recent determination by USACE
Jean Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce

Overall, the construction of the proposed project would result in approximately 13.857 acres of temporary and 0.0661 acres of permanent impacts to potential waters falling under the jurisdiction of USACE, which are known as Waters of the United States. The potential jurisdictional status of each water body was determined by a combination of field surveys, review of NRCS digital hydrologic unit boundary layer data set, recent Jurisdictional Determinations issued by USACE for nearby projects, consultation with USACE staff, and review of high resolution aerial imagery. The formal determination of the jurisdictional status of waters will not be confirmed until a Jurisdictional Determination is issued by the USACE.

Along the California portion of the proposed project, construction of the project would potentially result in up to a total of approximately 15.524 acres of temporary impacts and up to approximately 0.333 acres of permanent impacts to playa and desert wash habitats that are presumed to fall under Section 1600 jurisdiction of the CDFG. Again, final jurisdiction will be confirmed by the CDFG during the permitting process for the project.

Wildlife Communities

The mammalian fauna with potential to occur within the project area is dominated by small, mostly nocturnal species of rodents and bats. Diurnal mammals that are also potentially common ~~and~~ include hares, rabbits, ground squirrels (*pe ophil s te eti a s*), and ungulates. The following species were observed ~~on~~ in the project ~~site~~ area: black-tailed jack rabbit (*ep s alifo ni s*), desert wood rat (*eoto a lepi a*), white-tailed antelope squirrel (*ospe ophil s le s*), gray fox (*o yon ine eoa gente s*), wild burro (*s asin s*), and desert bighorn sheep (*is ana ensis nelsoni*). Additionally, 22 other mammal species have the potential to occur within the proposed project area (refer to the Eldorado–Ivanpah Transmission Project Biological Technical Report [EPG 2009]).

Very few amphibian species have the potential to occur within the proposed project area: two in California and four in Nevada. In contrast, the potential reptilian fauna is very diverse for the project in both California and Nevada. There are potentially 15 lizard species, 18 snake species, and one tortoise species that occur within the EITP in California. The EITP in Nevada provides habitat ~~for~~ to potentially support 17 lizard species, 18 snake species, and one tortoise species.

The proposed project area potentially hosts a wide variety of avian fauna, including songbirds, raptors, woodpeckers, owls, ground fowl, flycatchers, doves, cuckoos, shrikes, crows, and ravens. Approximately 46 bird species may occur in the proposed project area. Many of these birds ~~would~~ may only winter in the area (e.g., Northern flicker [*olaptes a at s*], sage thrasher [*eos optes ontan s*], and white-crowned sparrow [*onot i hia l e ophy s*]), while others, such as the red-tailed hawk (*teo a ai ensis*), chukar (*le to is h ka*), and greater roadrunner (*oe o y alifo nian s*) are potential year-round residents. Additionally, numerous species may use vegetation or soil burrows to breed within the proposed project area. A full list of species with the potential to occur is found in the Eldorado–Ivanpah Transmission Project Biological Technical Report (EPG 2009).

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, or proposed, or those that are candidates for listing under the Endangered Species Act (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 species 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 that may not be taken or possessed at any time and for which permits are required for scientific collection and/or relocation (for the protection of livestock).

In Nevada, at-risk species 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.

Plant and animal species that both are special status and are among those having greatest probability of occurrence within the proposed project area in California and Nevada are identified in Tables 3.4-6 and 3.4-7. Some species are included only in the California table or only in the Nevada table based solely on their state-protected status, even though most of these species are likely to occur in both states. The California list was derived from an online search of the CNDDB, coupled with lists of species of concern to the BLM and additional review of published literature. Similarly, the Nevada list was derived from an online review of the listing of special-status species maintained by the NNHP as well as lists of species of concern to the BLM and species covered by the Multiple Species Habitat Conservation Plan (MSHCP) of Clark County, Nevada. The narrative following the tables addresses only those species of special concern identified as occurring or likely to occur within the proposed project area.

Table 3.4-5 Special-Status Species of Wildlife and Plants with Potential to Occur in the California Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Plants				
Mormon needle grass	*hnathe a i*	Outcrops in shrub-steppe, ~~pinion~~ pinyon–juniper, and Joshua tree habitats between 3,940 and 5,100 feet in elevation	S2.2	L
Small-flowered androstephium	*n ostephi b e iflo*	Creosote bush scrublands on sandy to gravelly soils, stabilized dunes to alluvial fans between 720 and 5,260 feet in elevation	S1.3	O
White bearpoppy	*to e on e ia ii*	Creosote bush scrub, limestone outcrops and dry lake beds at elevations between 2,000 and 6,280 feet	S2.2	L
Mojave milkweed	*s lepias ny taginifolia*	Arroyos and dry slopes in Mojave Desert scrub between 1,500 and 5,580 feet in elevation	S2	O
Borrego milkvetch	*st agal s lentiginos s* var. *bo egan s*	Sandy flats and semi-stabilized dunes in creosote bush scrub	S3.3, S1	O
Spring Mountain milkvetch	*st agal s e ot s*	Gravelly limestone or sandstone soils or washes in creosote bush scrub between 3,600 and 5,500 feet in elevation	S2	L
Scaly cloak fern	*st olepis o hisensis o hisensis*	~~Pinion~~Pinyon-juniper and Joshua tree habitats between 2,950 and 5,900 feet in elevation	S2.3	L
Black grama	*o telo a e iopo a*	Dry, open, sandy to rocky slopes, flats, washes, scrub, and woodland between 2,950 and 6,230 feet in elevation	S3.2	O
Gilman's cymopterus	*y opte s gil anii*	Limestone- or gypsum-derived soils between 3,280 and 6,560 feet in elevation	S2.2	L
Utah vine milkweed	*ynan h tahense*	Sandy to gravelly soils in Mojave Desert scrub at 492 to 4,659 feet in elevation	BLM, S3.3	O
Clark Mountain buckwheat	*iogon hee anni* var *flo os*	Calcareous, gravelly slopes or washes in creosote bush or saltbush scrub. Restricted to a few ranges in SW Nevada and possibly in adjacent California areas. Elevations between 2,950 and 7,540 feet	BLM, S2	O
Desert pincushion	*s oba ia i ipa a* var. *ese ti**	Limestone soils 3,281 to 7,874 feet in elevation	S2.2	†
Viviparous foxtail cactus	*s oba ia i ipa a* var. *osea*	Sandy to rocky often calcareous soils, desert woodland slopes between 4,100 and 8,860 feet in elevation	S1, S2	†
Nine-awned pappus grass	*nneapogon es a i*	Rocky slopes or in crevices on calcareous soils in desert woodland; ~~pinion~~ pinyon-juniper between 4,180 and 5,990 feet in elevation	S2	O
California barrel cactus	*e o a t s ylin a e s*	Gravelly or rocky hillsides, canyons, and alluvial fans between 200 and 5,000 feet in elevation	BLM‡	O

Table 3.4-5 Special-Status Species of Wildlife and Plants with Potential to Occur in the California Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Parish club cholla (a.k.a. matted cholla)	*sonia pa ishii*	Joshua tree habitat between 3,000 and 5,000 feet in elevation; this plant is present on the proposed Ivanpah Substation site	S2.3	O
Hairy-podded fine-leaf hymenopappus	*y enopapp s filifoli s* var. *e iopo s*	Limestone soils in ~~pinion~~ pinyon-juniper habitat in the New York Mountains and Clark Mountain~~s~~ Range. Known to occur between 5,250 and 5,580 feet in elevation	S1.3	L
Hillside wheat grass	*ey s salin s o a ensis*	Hillsides in desert mountains and ~~pinion~~ pinyon-juniper woodland between 4,430 and 7,000 feet	S1.3	L
Plains flax	*in p be l*	Dry ridges of desert mountains between 2,000 and 8,200 feet in elevation	S2.3	L
Rough menodora	*eno o a s ab a*	Rocky soils of canyons in the New York Mountains and Clark Mountain~~s~~ Range between 1,500 and 7,500 feet in elevation. This plant is present along the Mountain Pass Alternative.	S2.3	~~L~~O
Polished blazing star	*ent elia polita*	Limestone or gypseous soils between 3,940 and 4,920 feet in elevation in the Clark Mountain~~s~~ Range	S1.2	L
Red four o'clock	*i abilis o inea*	Dry, rocky slopes, and washes; ~~pinion~~ pinyon-juniper habitat between 3,510 and 5,900 feet in elevation	S2.3	L
Tough muhly	*hlenbe gia a senei*	Limestone rock outcrops and slopes; Clark Mountain~~s~~ Range between 4,590 and 6,100 feet in elevation	S1, S2	L
Curved-spine beavertail	*p ntia ospina*	Mojave Desert scrub between 3,280 and 4,590 feet in elevation	S1.2	L
Spiny cliffbrake	*ellaea t n ata*	Granite or igneous outcrops between 3,900 and 7,050 feet in elevation; ~~pinion~~ pinyon-juniper habitat in the New York Mountains	S2	L
White-margined beardtongue	*enste on albo a ginat s*	Sand dunes and/or deep, sandy soils at elevations ranging from 2,560 to 5,890 feet in elevation	S1.2	L
Rosy two-toned beardtongue	*enste on bi olo* ssp. *ose s*	Rocky, calcareous soils and scree in creosote bush or black bush desert scrub at elevations from 1,800 to 4,840 feet	S1.3	L
Stephens' penstemon	*enste on stephensii*	Desert scrub or ~~pinion~~ pinyon-juniper woodland at elevations from 3,800 to 6,070 feet	BLM‡	L
Aven Nelson's phacelia	*ha elia anelsoni*	Sandy or gravelly soils in creosote bush, ~~pinion~~ pinyon-juniper, or Joshua tree habitats between 3,900 and 4,920 feet in elevation	S2.3	O
Sky-blue phacelia	*ha elia oe lea*	Open, sandy to rocky areas in Mojave Desert scrub and ~~pinion~~ pinyon-juniper habitats between 2,000 and 6,560 feet in elevation	S2.3	O

Table 3.4-5 Special-Status Species of Wildlife and Plants with Potential to Occur in the California Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Chamber's physaria	*hysa ia ha be sii*	Limestone soils in ~~pinion~~ pinyon-juniper habitat in the Clark Mountain~~s~~ Range between 4,920 and 8,500 feet in elevation	S2.3	L
Abert's sanvitalia	*an italia abe ti*	Dry slopes from 5,150 to 5,900 feet in elevation in the New York Mountains and Clark Mountain~~s~~ Range	S1, S2	L
~~Rusby's desert mallow~~ Johnson's beehive cactus	~~*phae al ea sbyi* var. *e e i ola*~~ *le o a t s ohnsonii*	~~Mojave Desert scrub and Joshua tree habitats between 3,200 and 4,920 feet in elevation; Clark Mountains~~ Occurs in creosote bush habitat on granite soils from 500 to 1,200 meters.	BLM, ~~S1.3~~ S2	L
Rusby's desert mallow	*phae al ea sbyi* var. *e e i ola*	Mojave Desert scrub and Joshua tree habitats between 3,200 and 4,920 feet in elevation; Clark Mountain Range	BLM, S1.3	L
Mammals				
American badger	*Ta i ea ta s*	Mojave Desert scrublands on flats and alluvial fans with friable soils where rodents are present	BLM, S4, SSC	L
Desert bighorn sheep	*is ana ensis nelsoni*	Large, relatively contiguous areas of steep, sparsely vegetated mountainous terrain. ~~Present~~ Two individuals were observed in the McCullough Range.	BLM, S3, FPS[1]	L
Wild burro	*s asin s*	Mostly low desert environments in scrublands and woodlands. ~~Scat~~ Recent scat recorded in California at west Ivanpah Dry Lake	WHBA	L ~~O~~
Townsend's big-eared bat	*le ot s to nsen ii*	Roosts in mines, caves, and buildings in Mojave Desert scrub	BLM, S2, S3	L
Birds				
Golden eagle	*ila h ysaetos*	Open country in woodland or mountains, nests on cliff ledges or very large trees. Recorded near Ivanpah Substation in California and south of the Eldorado Substation along the existing Eldorado–Lugo transmission line in Nevada	FPS	O ~~L~~
Western burrowing owl	*thene ni la ia hyp gaea*	Open, sparsely vegetated land with available animal burrows. ~~Observed~~ A burrowing owl pellet was observed along Alternative C, near California/ Nevada border	BLM, S2, SSC	L ~~O~~
Loggerhead shrike	*ani s l o i ian s*	Occurs in desert scrub, denser vegetation along washes, and woodlands. Observed along California project segments	BLM	O
Crissal thrasher	*To osto a issale*	Occurs where dense thickets of mesquite or other shrubs occur along desert washes or wetlands	S3	L
Le Conte's thrasher	*To osto a le ontei*	Most common in sparse, open vegetation including creosote bush scrub and saltbush scrub. Individuals were observed along the proposed transmission route in Nevada.	BLM‡	L

Table 3.4-5 Special-Status Species of Wildlife and Plants with Potential to Occur in the California Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Reptiles				
Desert tortoise	*ophe s agassi ii*	Occurs in Mojave Desert scrub and Joshua tree woodlands in valleys, on bajadas, and in low hills at elevations of up to 4,900 feet. ~~Observed at various points along the project alignment.~~ Sign and individuals were observed within suitable habitat throughout the project area.	FT, ST, S2	O
Gila monster	*elo e a s spe t*	Prefers rocky outcrops, canyons, foothills, bajadas, and edges of washes with dense vegetation rather than open scrublands. A Sonoran desert species, peripheral in the Mojave desert	BLM‡, ~~S4~~ S1, SSC	L

Sources: Benson 1982; CDFG 2003; Jepson 2008

Key:
* Formerly *o yphantha hlo antha*.
** Formerly *o yphantha i ipa a* var. *rosea*
† Individuals of an unknown species of *s oba ia* (*o yphantha*) were located; species determination will require presence of flowers.
‡ BLM sensitive species not listed in the CNDDB database.
[1] Except as provided by California Fish and Game Code Section 4902

Status
BLM = Bureau of Land Management sensitive species
FPS = State of California Fully Protected Species
SSC = State of California Species of Special Concern
FT = Federally listed as threatened (Endangered Species Act)
ST = California listed as threatened

Potential of Occurrence
L = Likely (moderate or better potential)
O = Observed during reconnaissance studies or Protocol-level Surveys

CNDDB state ranking:
S1 = Less than 6 element occurrences (EOs), or fewer 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

Table 3.4-6 Special-Status Species of Wildlife and Plants With Potential to Occur in the Nevada Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Plants				
Catclaw Acacia	*a ia g eggii*	Well-drained, sandy or rocky soils. Chaparral & brush country. Washes; stream banks; brushlands. The species was observed in desert washes within the project area in Nevada and California.	MSHCP	O ~~L~~
White bearpoppy	*to e on e ia ii*	Creosote bush scrub, limestone outcrops and dry lake beds at elevations between 2,000 and 6,280 feet	BLM, W, MSHCP	L
Spring Mountain milkvetch	*st agal s e ot s*	In gravelly or sandy soils in desert wash or desert shrub communities between 3.400 and 7,050 feet in elevation		L
Parish club cholla (a.k.a. matted cholla)	*sonia pa ishii*	Joshua tree habitat between 3,000 and 5,000 feet in elevation.	BLM	O
Scrub Lotus	*ot s a gy ae s a lti a lis*	Pinyon Juniper Woodlands. Habitat sandy washes, ledges or clay slopes in canyons.	MSHCP	L
White-margined beardtongue	*enste on albo a ginat s*	Sand dunes and/or deep, sandy soils at elevations ranging from 2,560 to 5,890 feet	BLM, ART, MSHCP	O
Rosy twotone beardtongue	*enste on bi olo* ssp. *ose s*	Rocky, calcareous soils and scree in creosote bush or black bush desert scrub at elevations of from 1,800 to 4,840 feet	BLM, ART	O
Honey Mesquite	*osopis glan losa*	Found in desert drainage ways. Well-drained sandy soils.	MSHCP	L
Johnson's beehive cactus	*le o a t s ohnsonii*	Occurs in creosote bush habitat in rocky habitats.	BLM	O
Mammals				
Desert Pocket Mouse	*haeto ip s peni illat s*	Inhabit the sandy, open desert with sparse vegetation of grasses, mesquites, creosote bushes, and a few cacti.	MSHCP	L
Desert Kangaroo Rat	*ipo o ys ese ti*	Found in a variety of desert scrub habitats, the common factor being a substrate of wind-drifted sand, probably not less than 50 cm (20 in) deep. Preferred canopy is sparse to moderate. Less common in denser stands. Areas of soft sand, such as dunes; creosote bush or shad scale scrub.	MSHCP	L
Wild burro	*s asin s*	Mostly low desert environments in scrublands and woodlands. Scat recorded in California at west Ivanpah Lake	WHBA	L
California leaf-nosed bat	*a ot s alifo ni s*	Caves and mines in desert scrub habitat, generally below 3,280 feet in elevation. Requires warm roost sites in winter	BLM, ART	L
California myotis	*yotis alifo ni s*	Dry, brushy habitats; roosts in cracks and crevices	BLM, ART	L
Townsend's big-eared bat	*o yno hin s to nsen ii*	Roosts in mines, caves, and buildings in Mojave Desert scrub	BLM, ART	L
Big free-tailed bat	*y tino ops a otis*	Roosts in rugged, rocky areas in desert scrub	BLM, ART	L
Desert bighorn sheep	*is ana ensis nelsoni*	Large, relatively contiguous areas of steep, sparsely vegetated mountainous terrain. ~~Present~~ Two individuals were observed in the McCullough Range.	BLM	O
American badger	*Ta i ea ta s*	Mojave Desert scrublands on flats and alluvial fans with friable soils where rodents are present	BLM, S4	O ~~L~~

Table 3.4-6 Special-Status Species of Wildlife and Plants With Potential to Occur in the Nevada Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Kit Fox	*lpes a otis*	Inhabit arid and semi-arid regions encompassing desert scrub, chaparral, halophytic, and grassland communities. Prefer loose textured soils and generally avoid rugged terrain.	MSHCP	L
Birds				
Golden eagle	*ila h ysaetos*	Open country in woodland or mountains, nests on cliff ledges or very large trees. Recorded near Ivanpah Substation site in California and south of the Eldorado Substation along the existing Eldorado–Lugo transmission line in Nevada	BLM	O ~~L~~
Western burrowing owl	*thene ni la ia hyp gaea*	Open, sparsely vegetated land with available animal burrows. Observed along Alternative C, near California/Nevada border	BLM, 501	L
Peregrine falcon	*al o pe eg in s*	Nests on cliffs surrounded by large expanses of open space in a variety of habitats. Known to breed in the McCullough Range. Observed along the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115 kV transmission line near Primm, Nevada.	BLM, 501, MSHCP	O ~~L~~
Prairie falcon	*al o e i an s*	Nests on cliffs and in deep canyons in a variety of arid and desert habitats. Known to occur in the McCullough Range. Observed along the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115 kV transmission line near Eldorado Substation	BLM	O ~~L~~
Loggerhead shrike	*ani s l o i ian s*	Occurs in desert scrub, denser vegetation along washes, and woodlands. Observed west of the McCullough ~~Mountains~~Range	BLM	O
Phainopepla	*hainopepla nitens*	Mostly mesquite thickets along washes, but also desert scrub and woodland habitats. Observed on Nevada project segments	BLM, 501, MSHCP	O
Le Conte's Thrasher	*To osto a le ontei*	Saltbush/shadscale vegetation or cholla cacti in sandy substrate. It needs vegetative litter for cover and for obtaining prey. Individuals were observed along the proposed transmission route in Nevada.	MSHCP, FT	O ~~L~~
Crissal Thrasher	*To osto a issale*	Primarily inhabits dense desert scrub and arroyo riparian vegetation. It also occurs in foothill scrub and pinyon-juniper woodland with a shrubby understory.	MSHCP, National Bird of Conservation Concern by USFWS	L
Gray Vireo	*i eo i inio*	Dry thorn scrub, chaparral, and pinyon-juniper and oak-juniper scrub, in arid mountains and high plains scrubland.	MSHCP, National Bird of Conservation Concern by USFWS	L
Cactus Wren	*a pylo hyn h s nnei apill s*	Primarily inhabit areas that are desert or semi-desert; they also live along arid hillsides and locales that provide them with vegetation such as spiny cacti and cholla, which is used for nesting.	MSHCP	L
Scott's Oriole	*Icterus parisorum*	Found in desert grassland prairies and mountain canyons, particularly if yucca or palms are present; nests in pinyon-juniper woodlands, sycamores, and cottonwoods.	MSHCP	L
Reptiles				
Desert tortoise	*ophe s agassi ii*	Occurs in Mojave Desert scrub and Joshua tree woodlands in valleys, on bajadas, and in low hills at elevations up to 4,900 feet. ~~Observed at various points along the project alignment~~ Sign and individuals were observed within suitable habitat throughout the project area.	FT, 501, MSHCP	O
Gila monster	*elo e a s spe t*	Prefers rocky outcrops, canyons, foothills, bajadas, and edges of washes with dense vegetation rather than open scrublands. A Sonoran desert species, peripheral in the Mojave desert	BLM, 501	L
Chuckwalla	*a o al s ate*	Rocky outcrops with crevices for hiding in Mojave Desert scrub. Observed near the McCullough Pass alignment	BLM	O
Western banded gecko	*oleony a iegat s*	Creosote bush scrub, associated with rocks, or sometimes barren dunes. Largely nocturnal	MSHCP	L

Table 3.4-6 Special-Status Species of Wildlife and Plants With Potential to Occur in the Nevada Segment of the Proposed Project Area

Common Name	Scientific Name	Habitat	Status	Potential
Desert iguana	*ipsosa s o salis*	Creosote bush scrub with loose sand, or hardpan areas with rocks	MSHCP	L
Black collared lizard	*otaphyt s ins la is*	Frequents rocky areas in arroyos and on slopes of hills in creosote bush, saltbush, and Basin sagebrush deserts	MSHCP	L
Long-nosed leopard lizard	*a belia isli enii*	Open scrublands such as creosote bush, alkali bush, or sagebrush on various substrates	MSHCP	L
Western leaf-nosed snake	*hyllo hyn h s e tat s*	Sandy or gravelly substrates associated with creosote bush scrub	MSHCP	L
Glossy snake	*i ona elegans*	Variety of habitats from sparse desert scrub to chaparral, as well as grasslands, mostly at low elevations	MSHCP	L
Common kingsnake	*a p opeltis get la*	Found in a wide variety of habitats, including deserts with rock shelters or animal burrow refuges	MSHCP	L
Long-nosed snake	*hino heil s le ontei*	Occurs in desert or shrubby habitats mostly in valleys and hills	MSHCP	L
Lyre snake	*T i o pho on bis tat s*	Most often found in areas of massive rock outcrops in creosote bush, desert scrub, or desert grasslands	MSHCP	L
Speckled rattlesnake	*otal s it hellii*	Generally in rocky areas, usually associated with creosote bush. Range includes sagebrush, succulent desert, and ~~pinion~~ pinyon-juniper	MSHCP	L
Sidewinder	*otal s e astes*	Fine wind-blown sand areas in hummocks; also on flats and rocky hillsides. Associated with creosote bush and desert scrublands	MSHCP	L
Mojave rattlesnake	*otal s s t lat s*	Most common in upland desert scrublands in creosote bush habitat and also in mesquite thickets and barren desert	MSHCP	L
Desert Horned Lizard	*hy ynoso a platy hinos*	Arid regions with some loose sandy soils for burrowing, and limited vegetation such as sagebrush or shadscale. They can also be found in areas with hardpan and gravelly soils as well.	MSHCP	L

Status Codes
501 = Protected under NRS 501
ART = Nevada Natural Heritage Program At Risk Taxa
BLM = BLM sensitive species
FT = Federally listed as threatened
MSHCP = Clark County Multiple Species Habitat Conservation Plan
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

Potential of Occurrence
L = Likely (moderate or better potential
O = Observed During Reconnaissance Studies or Protocol-level Surveys

The following wildlife and plant species were identified on USFWS, CDFG, and BLM lists as potentially occurring within California in the vicinity of the project, but are highly unlikely to occur on site due to a lack of suitable habitat, appropriate soils, and/or suitable elevation and thus are excluded from Table 3.4-5. The wildlife species excluded are hoary bat (*asi s ine e s*), ringtail (*assa i s ast t s*), gray vireo (*i eo i inio*), Bendire's thrasher (*To osto a ben i ei*), Virginia's warbler (*e i o a i giniae*), hepatic tanager (*i anga fla a*), summer tanager (*i anga b a*), grey-headed junco (*n o hye alis*), and Kokoweef Crystal Cave harvestman (*Te ella koko eef*). The plant species excluded are desert ageratina (*ge atina he ba ea*), Cima milkvetch (*st agal s i ea* var. *i ae*), Howe's hedgehog cactus (*hino e e s engel annii* var. *ho ei*), limestone daisy (*ige on n ialis* var. *n ialis*), Clark Mountain spurge (*pho bia e stip lata* var. *e stip lata*), hairy erioneuron (*ione on pilos*), Wright's bedstraw (*ali ightii*), pungent glossopetalon (*lossopetalon p ngens*), Jaeger's ivesia (*esia aege i*), knotted rush (*n s no os s*), false buffalo grass (*n oa s a osa*), beavertail pricklypear (*p ntia basila is* var. *b a hy la a*), Thompson's beardtongue (*enste on tho psoniae*), Jaeger's phacelia (*ha elia pe ityloi es* var. *aege i*), small-flowered rice grass (*iptathe i anth*), New Mexico locust (*obinia neo e i ana*), many-flowered schkuhria (*hk h ia ltiflo a* var. *ltiflo a*), and Johnson's beehive cactus (*le o a t s ohnsonii*).

The following wildlife and plant species were identified on USFWS, Nevada Department of Wildlife (NDOW), BLM, and Clark County MSHCP lists as potentially occurring within the project area in Nevada but are very unlikely to occur on site due to a lack of suitable habitat, appropriate soils, and/or suitable elevation and thus are excluded from discussion. The wildlife species excluded are small-footed myotis (*yotis iliolab*), long-eared myotis (*yotis e otis*), little brown bat (*yotis l if g s*), fringed myotis (*yotis thysano es*), cave myotis (*yotis elife*), long-legged myotis (*yotis olans*), spotted bat (*e a a lat*), Nevada admiral (*i enitis ei e eye ii ne a ae*), Carole's silver-spot butterfly (*peye ia e ene a olae*), and Spring Mountains comma skipper (*espe ia olo a o o a ensis*). The plant species excluded are Las Vegas bear poppy (*to e on alifo ni a*), Clokey milkvetch (*st agal s ae alis*), blue diamond cholla (*p ntia hipplei* var. *ltigeni lata*), scrub lotus (*ot s a gy ae s* var. *lti a lis*), Jaeger beardtongue (*enste on tho psoniae* var. *aege i*), and Parish's phacelia (*ha elia pa ishii*).

Plants

~~Twenty-nine~~Thirty-three special-status plant species occur or are ~~very~~ likely to occur along the California segment of the project, while ~~four~~ seven special-status plant species occur or are ~~very~~ likely to occur along the Nevada segment of the project. Based on a review of the existing state and federal databases, no plant species listed as threatened or endangered by the federal government or the states of California or Nevada are expected to occur within the proposed project area.

Mormon Needle Grass (S2.2)

Mormon needle grass (*hnathe a i*) is associated with rock outcrops or shrub-steppe habitats where Joshua tree or ~~pinion~~ pinyon-juniper woodland habitats exist on carbonate soils (CNPS 2001). Stems may approach 3 feet in height, with the inflorescence, which may be partially enclosed by the upper leaf sheath, being 2 to 7 inches in length. Plants flower in May or June (Jepson 2008). Mormon needle grass was not observed during surveys, but suitable habitat is present for the species in Antimony Canyon east of the Mountain Pass Substation.

Small-flowered Androstephium (S1.3)

Small-flowered androstephium (*n ostephi b e iflo*) is a perennial herbaceous monocot bulb native to the Mojave Desert of California and parts of western Arizona and southern Nevada (USDA 2009b). Sage green strap-like leaves surround a 10- to 30-centimeter (cm) flower stalk topped by three to 12 funnel-shaped white to lavender flowers 1 to 2 cm long (Hickman 1993). Blooming occurs between April and May. This species is associated with sandy to gravelly soils of alluvial fans or stabilized dunes in creosote bush scrub vegetation (eFlora 2009). ~~This plant was observed along Transmission Alternative Route D in California.~~ This plant was observed in 2008 along the proposed transmission route near the Ivanpah Substation in California and in 2010 in Nevada along Transmission Alternative Route D/E in Nevada.

White Bearpoppy (S2.2)

The white bearpoppy (*to e on e ia ii*) is an evergreen perennial herb. The leaves are basal, rounded-dentate, and moderately hairy, 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 2001b). 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 (Jepson 2008, NNHP 2001b). Populations of the white bearpoppy are decreasing in number (NNHP 2001b).

The white bearpoppy was not observed during surveys, but suitable habitat for the species occurs within the proposed project area. There is a CNDDB record of the species northeast of Umberci Mine at "Bearpoppy Saddle," which is approximately 4 miles west of the north end of Transmission Alternative Route C. Additional observances have been recorded between the Umberci Mine and Stateline Pass to the northeast.

Mojave Milkweed (S2)

Mojave milkweed (*s lepias ny taginifolia* is a perennial plant with decumbent to erect stems to about 1 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 (CNPS 2001, Kearney and Peebles 1960). In California the species is generally associated with ~~pinion~~ pinyon-juniper woodland (Calflora 2008). The range of the Mojave milkweed is from San Bernardino County, California, east to New Mexico (CNPS 2001).

A single Mojave milkweed plant was observed during the rare plants survey approximately 0.55 miles southwest of the proposed Ivanpah Substation site in California. Suitable habitat is present from this location west to the vicinity of the Mountain Pass Substation.

Borrego Milkvetch (S1, S3.3)

Borrego milkvetch (*st agal s lentiginos s* var. *bo egan s*) is a short-lived perennial or annual dicot herb with multiple stems up to 45 cm long. Silvery compound leaves occur with pea-shaped purple to lavender flowers in clusters of one to 15. Flowering occurs between March and May (Calflora 2009). The species is widely distributed in native to sandy or gravel soils in both the Mojave and Sonoran deserts in California, Nevada, and portions of Arizona (USDA 2009c). This plant was observed along the portion of Nipton Road included in both the Mountain Pass and Golf Course Telecommunication Alternatives in California.

Spring Mountain Milkvetch (S2)

Spring Mountain milkvetch (*st agal s e ot s*) is a perennial herb with several erect stems, 1.5 to 4 decimeters (dm) long, and with grayish compound leaves and buff-colored, lilac-tinged flowers. It blooms from April to early June and is commonly found in desert scrub or washes in dry, rocky-to-sandy soils derived from calcareous limestone or sandstone (USDA 2009c). This species may occur along the route in California west of Primm near the toe of the Spring Mountains.

Scaly Cloak Fern (S2.3)

The scaly cloak fern (*st olepis o hisensis* var. *o hisensis*) is a perennial herb of small stature, generally between 1 and 4 inches in height, associated with limestone outcrops and associated rocky slopes in ~~pinion~~ pinyon-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 is present in the vicinity of the Mountain Pass Substation, but the plant was not observed during surveys.

Black Grama (S3.2)

Black grama (*o telo a e iopo a* is a tufted perennial grass of the western United States and northern Mexico that has decumbent to erect stems 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 ~~pinion~~ pinyon-juniper habitat (CNPS 2001, Gould 1951, Jepson 2008). Black grama is present along the route and was observed in more than one location in Antimony Canyon east of the Mountain Pass Substation during rare plant surveys.

Gilman's Cymopterus (S2.2)

Gilman's cymopterus (*y opte s gil anii*) is known to be present only in Nevada and California, and occurs in Mojave Desert scrub habitat, often on carbonate substrates (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 project surveys, but there are CNDDB occurrences of the species in the Clark Mountain~~s~~ Range, and suitable habitat may be present near the Mountain Pass Substation. There are also CNDDB records of the species occurring at Bear Poppy Saddle, which is approximately 4.0 miles west of the north end of Transmission Line Alternative C, and to the north near Kally Mine and the vicinity of Stateline Pass.

Utah Vine Milkweed (BLM, S3.3)

Utah vine milkweed (*ynan h tahense* is native to the Mojave Desert and is known to be present in the states of Utah, Arizona, Nevada, and California. Utah vine milkweed is a member of the dogbane family (*po yna eae*). It is a small (up to about 1 meter [m]), 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. Multiple occurrences of the Utah vine milkweed were recorded during the rare plant survey along the proposed telecommunication line route in California just southwest of the proposed Ivanpah Substation site and directly east of Nipton.

Desert Pincushion (S2.2)

The desert pincushion cactus (*s oba ia i ipa a* var. *ese ti*) was formerly known as *o yphantha hlo antha*, 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 6 inches in height, and the flower color is variable. Flowers usually occur in April and May (Jepson 2008). The species occurs on carbonate soils between approximately 3,280 and 7,870 feet in elevation.

~~A~~ The desert pincushion cactus was observed along the Eldorado–Lugo Telecommunication Line during the 2010 botanical survey. During the 2008 botanical survey, a species of *s oba ia* cactus ~~is~~ was present at several locations along the route from the Mountain Pass Substation east for a distance of approximately 3.5 miles. Most of the occurrences are within 0.4 miles of the substation. These cacti are of either the *ese ti* variety or are the viviparous foxtail cactus (*s oba ia i ipa a* var. *osea*), but their identity could not be decisively determined because flowers were not present on the plants when the rare plant survey was conducted. Flowers must be present in order to discriminate between these two varieties of *i ipa a*.

Viviparous Foxtail Cactus (S1, S2)

The viviparous foxtail cactus was formerly known as *o yphantha i ipa a* var. *osea*. The range of this species includes northwestern Arizona, southern Nevada, and southeast California (Benson 1982). This cactus occurs on limestone substrates in ~~pinion~~ pinyon-juniper woodland or on low hills and slopes in Mojave Desert scrub (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 Mountain~~s~~ Range, and it may be the species that is present along the route, as mentioned above under the discussion of the desert pincushion.

Nine-awned Pappus Grass (S2)

Nine-awned pappus grass (*nneapogon es a i*) occurs on calcareous soils, usually associated with slopes or rocky crevices in desert woodland habitat. The species ranges from southern California east to Texas, and south to Peru. Plant stems may reach about 20 inches in height, with the inflorescences present in August and September (Jepson 2008). Nine-awned pappus grass was found during the rare plant survey. A single occurrence of this species was recorded 2.2 miles southwest of the proposed Ivanpah Substation site.

Clark Mountain Buckwheat (BLM)

The Clark Mountain buckwheat (*iogon hee annii* var. *flo os*) is a perennial subshrub that can grow up to 0.5 m tall. It is composed of a basal rosette of oblong grayish leaves, topped by a network of finely jointed branches with many small (1 to 3 mm), inconspicuous, pale yellowish flowers. It occurs on gravelly slopes and washes in desert scrublands. This species has a very limited distribution and is confined to a few mountain ranges in southeastern California and southwest Nevada (eFlora 2009, USDA 2009d). This plant was observed along the California segment of the route.

California Barrel Cactus (BLM)

The California barrel cactus (*e o a t s ylin a e s*) 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). It was considered too common to be included in the CNPS Inventory of Rare and Endangered Plants of California (2001). The BLM policy for this species is avoidance. If avoidance is not possible, individuals of this species should be temporarily relocated to areas outside of the disturbance footprint and used in later restoration and re-vegetation efforts of temporary disturbance areas.

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. Two varieties could be present in the proposed project area: var. *le ontei*, which occurs between 2,500 and 5,000 feet in elevation, and var. *a antho es*, which occurs between 200 and 2,500 feet in elevation. This species was found ~~in moderate density~~ along the proposed route in California west of Ivanpah Dry Lake and along the proposed transmission and telecommunication line in Nevada, near and in the McCullough Range.

Parish Club Cholla (Matted Cholla; BLM, S2.3)

Parish club cholla (*sonia pa ishii*) is known to be present in 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, dunes, and hills. During rare plant surveys, Parish club cholla was found on the proposed Ivanpah Substation site and along the proposed transmission and telecommunication alignment north and south of the substation site in California. It was also found in 2010 surveys in Nevada along the existing Eldorado to Lugo line route.

Hairy-podded Fineleaf Hymenopappus (S1.3)

Hairy-podded fineleaf hymenopappus (*y enopapp s filifoli s* var. *e iopo s*) inhabits limestone soils among pines and/or junipers at elevations of about 1,600 to 1,700 m (5,250 to 5,580 feet; Jepson 2008). Plants may reach 0.8m (30 inches) in height and produce whitish flowers in May or June, and occasionally again in October (Jepson 2008). This species is recorded in the Clark and New York mountains, and may occur near the Mountain Pass Substation.

Hillside Wheat Grass (S1.3)

Hillside wheat grass (*ey s salin s o a ensis*) grows to about 14 dm (55 inches) in height with an inflorescence to 14 cm (5.5 inches) long, and flowers between May and June. This grass occurs on rocky hillsides in~~ pinion~~ pinyon-juniper habitat (CNPS 2001, Jepson 2008). The only place within the project ROW where this species might occur is in the vicinity of the Mountain Pass Substation, where suitable habitat is found.

Plains Flax (S2.3)

Plains flax (*in p be l*) inhabits dry ridges of deserts, mesas, or mountains from California to Colorado and Texas (Jepson 2008). Plains flax is a perennial species that can grow to about 15 inches in height (Epple and Epple 1995, Jepson 2008, Kearney and Peebles 1960). The flowers, which have yellow to orange petals, may bloom any time between April and October (Epple and Epple 1995, Jepson 2008). Plains flax was not observed during project surveys, but suitable habitat is present throughout the proposed project area.

Rough Menodora (S2.3)

Rough menodora (*eno o a s ab a*) is a shrub that grows to about 18 inches in height and 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 (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 surveys but may occur within the project limits on the east flank of the Clark Mountains.~~ Rough menodora was observed along the Mountain Pass Alternative to the southeast of the Mountain Pass Substation and may occur within the project limits on the east flank of the Clark Mountain Range.

Polished Blazing Star (S1.2)

The polished blazing star (*ent elia polita*) is a perennial plant that grows to about 31 cm (1 foot) in height with white, peeling stems and linear to lanceolate leaves less than 7 cm (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 often associated with ephedra (*phe a ne a ensis* and sumac (*h s* spp.) The polished blazing star is present in the Clark Mountain~~s~~ Range (Charters 2008, Jepson 2008).~~ This species could occur within the proposed project area in the Clark Mountains.~~ This species could occur along the Mountain Pass Alternative in the Clark Mountain Range.

Red Four O'clock (S2.3)

Red four o'clock (*i abilis o inea*) 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~~ pinion~~ pinyon-juniper habitat (CNPS 2001, Jepson 2008). Red four o'clock was not observed during surveys, but suitable habitat for the species is present near the Mountain Pass Substation.

Tough Muhly (S1, S2)

Tough muhly (*hlenbe gia a senei*) is a perennial grass that may reach 4 dm (16 inches) in height. The inflorescence is 12 cm (4.7 inches) long and may be present from August to October. Tough muhly occurs on rock outcrops and limestone slopes in the Clark and New York Mountains (CNPS 2001, Jepson 2008).~~ Tough muhly could be present in the proposed project area near the Mountain Pass Substation.~~ Tough muhly could be present along the Mountain Pass Alternative in the Clark Mountain Range.

Curved-spine Beavertail (S1.2)

The curve-spined beavertail cactus (*p ntia ospina*), also known as the searchlight pricklypear, is a recognized hybrid between tulip and dollarjoint pricklypears (*phaea antha* and *hlo oti a*) that has been proposed as a distinct species (CNPS 2001, USDA 2008). The species occurs in Mojave Desert scrub, chaparral, and ~~pinion~~ pinyon-juniper woodland. Blooms appear on the plants between April and June (CNPS 2001). The curve-spined beavertail cactus could be present within the project limits.

Spiny Cliffbrake (S2)

Spiny cliffbrake (*ellaea t n ata*) occurs in rock crevices, on cliffs, and in boulder piles of granite or other igneous rocks in ~~pinion~~ pinyon-juniper habitat (CNPS 2001, Jepson 2008). Spiny cliffbrake was not observed during surveys, but suitable habitat is present in the steep, rocky terrain near the Mountain Pass Substation.

White-margined Beardtongue (BLM, ART)

The white-margined beardtongue (*enste on albo a ginat s*) is a multi-stemmed perennial herb that grows from rhizomes, 6 to 14 inches in height, with distinctive, 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 purplish (Jepson 2008, Smith 2001).

The white-margined beardtongue is currently present at 12 sites in Clark and Nye counties, Nevada (Smith 2001). The plants have also been recorded within San Bernardino County, California (NNHP 2001c). 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 (Smith 2001). All sites in Nevada are within either the creosote bush-bursage or Joshua tree-mixed shrub associations (NNHP 2001c, Smith 2001).

The white-margined beardtongue was observed along the project route during the 2008 and 2010 rare plant ~~survey~~ surveys in Nevada but may also occur along the California segments.

Rosy Two-toned Beardtongue (CA: S1.3, NV: BLM, ART)

The rosy two-toned beardtongue (*enste on bi olo* ssp. *ose s*) 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, and 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 in other places receiving enhanced runoff. The plants are found in creosote bush-bursage, black bush, and mixed shrub associations (Jepson 2008, NNHP 2001a). The plant is present in Clark and Nye counties, Nevada; Mohave County, Arizona; and California (Kearney and Peebles 1960, NNHP 2001a). Three occurrences of this species are known 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. At least 70 sites for the species are known in Nevada, most of which are the rose-flowered phase (Smith 2005). The two subspecies of the two-toned beardtongue (*b bi olo* and *b ose s*) are not considered valid taxa by Smith (2005), who includes them in *bi olo* .

No individuals of this species were found in California during the spring 2008 and 2010 surveys. However, the rosy two-toned beardtongue was observed at several locations along the project route in Nevada, primarily along the main drainage on the east flank of the north McCullough Pass area, and at a single locality along the Eldorado–Lugo transmission line corridor. Because of their stature, the plants stand out in the landscape, even when dormant. Based on recorded occurrences, the species is evidently widespread but is expected to be uncommon in the proposed project area.

Stephens' Penstemon (BLM)

Stephens' penstemon (*enste on stephensii*) occurs on rocky slopes or in bedrock crevices, and along washes, usually associated with carbonate soils, in habitats from creosote bush scrub to ~~pinion~~ pinyon-juniper woodland. The rose to magenta flowers may be present between April and June (CNPS 2001, Jepson 2008). Stephens' penstemon has not been observed during surveys, but suitable habitat is present in the proposed project area.

Aven Nelson's Phacelia (S2.3)

Aven Nelson's phacelia (*ha elia anelsoni*) is an annual herb that occurs on carbonate, sandy, or gravelly soils in a variety of habitats (Jepson 2008). The species' range extends from southern California across Nevada 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 locations ~~in the proposed project area~~ along the Mountain Pass Alternative, about 1 mile northeast of the Mountain Pass Substation.

Sky-blue Phacelia (S2.3)

Sky-blue phacelia (*ha elia oe lea*) is an ascending to erect annual herb that grows to about 16 inches in height. The plants inhabit sandy to rocky soils, from creosote bush desert to ~~pinion~~ pinyon-juniper habitats. The pale bluish to purple flowers may be present from April to May (CNPS 2001, Jepson 2008, Kearney and Peebles 1960). ~~Sky-blue phacelia was observed in the project area as a single occurrence approximately 2.8 miles northeast of the Mountain Pass Substation.~~ Sky-blue phacelia was observed north and south of the Mountain Pass Substation in California and along the telecommunication route on Nipton Road to the east of Nipton, Nevada. The species is likely to exist at other locations within the proposed project area.

Chamber's Physaria (S2.3)

Chamber's physaria (*hysa ia ha be sii*) is an herbaceous tufted plant that is usually no more than 6 inches in height. Leaves are basal and spatulate with an acute tip. Chamber's physaria is a limestone soil endemic species usually associated with ~~pinion~~ pinyon-juniper habitat. The species is recorded in the Clark and Grapevine mountains in California, and occurs north to Oregon and 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 is suitable habitat for the species in the Clark Mountain~~s~~ Range.

Abert's Sanvitalia (S1, S2)

Abert's sanvitalia (*an italia abe ti*) is an annual plant occurring on dry slopes in ~~pinion~~ pinyon-juniper woodland (CNPS 2001, Jepson 2008). Plants may reach 11 inches (29 cm) in height (Jepson 2008). The yellow flowers are present in August or September. In California the species is present in the Clark and New York mountains (Jepson 2008). Abert's sanvitalia might occur in the project area in the vicinity of the Mountain Pass Substation.

Johnson's Beehive Cactus (BLM, S2)

Johnson's beehive cactus (*le o a t s ohnsonii*) occurs in creosote bush habitat in rocky habitats in the Mojave Desert. Johnson's beehive cactus usually has a single stem to about 25 centimeters (10 inches) in height. The variable greenish-yellow, pink, or, magenta flowers bloom in April or May. In California, Johnson's beehive cactus is only known from Inyo County (CNPS 2001; Jepson 2008), but there is potential for the species to occur within the project limits in suitable habitat.

Rusby's Desert Mallow (BLM, S1.3)

Rusby's desert mallow (*phae al ea sbyi* var. *e e i ola*) occurs in Joshua tree woodland and Mojave Desert scrub habitats (CNPS 2001, Jepson 2008). The species is relatively short for a plant in the *phae al ea* genus, reaching only about 12 inches (3 dm) in height. Rusby's desert mallow occurs only in Death Valley and the Clark Mountain~~s~~ Range (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 Alternative Route C. This species could occur within the project area near the Mountain Pass Substation.

Catclaw Acacia (MSHCP)

Catclaw acacia (*a ia g eggii*) is a native, long-lived, deciduous, spreading shrub or small tree. Depending on the harshness of site conditions, catclaw acacia typically ranges from 3.3 to 29.5 feet (1 to 9 meters) tall. In Nevada, Catclaw acacia occurs with desert wash vegetation (Gucker 2005), and has been observed in desert washes within the project area in Nevada and California~~could occur within any portion of the project with this vegetation type~~.

Honey Mesquite (MSHCP)

Honey mesquite (*osopis glan losa*) is a deciduous, thorny shrub or small tree exhibiting a high degree of variation in growth form. The largest trees are often found along water courses or floodplains where the deep root system has access to year-round water. Drainage ways in the Mojave Desert are the primary habitat for western honey mesquite. This vegetation could occur in California and Nevada, although none was observed in the proposed project area during surveys.

Scrub Lotus (MSHCP)

Scrub lotus (*ot s a gy ae s a lti a lis*) is a perennial herb that is native to California and is endemic to California, but also found occasionally into Nevada. It occurs in pinyon-juniper woodland on mountain slopes or gravely sandy soils (Calflora 2010). This species has limited potential to occur within the project area.

Cactus and Yucca (BLM)

There were 15 species of cactus and yucca observed in the Nevada portion of the proposed project. A complete list of cactus and yucca species and the total number of individuals observed is found in Table 3.4-7. All of these species are protected and regulated under NRS 527.060.120, Nevada Administrative Code Chapter 527.060–120 and Nevada Administrative Code Chapter 527.

Table 3.4-7 Summary of Cactus and Yucca Species observed the Nevada Portion of the Proposed EITP[1,2,3]

Common Name	Scientific Name	Total number of individuals observed
Foxtail cactus	Escobaria cf. vivipara var. deserti	2
Buckhorn cholla	Cylindropuntia acanthocarpa var. coloradensis	491
Wiggins' cholla	Cylindropuntia echinocarpa	554
Pencil cholla,	Cylindropuntia ramosissima	114
Engelmann's hedgehog cactus	Echinocereus engelmannii	137
Johnson's fishhook cactus	Echinomastus johnsonii	45
Cottontop cactus	Echinocereus polycephalus	1
California barrel cactus	Ferocactus cylindraceus	67
Matted cholla	Grusonia parishii	6
Fishhook cactus	Mammillaria tetrancistra	8
Beavertail cactus	Opuntia basilaris	157
Pancake prickley-pear	Opuntia chlorotica	6
Banana yucca	Yucca baccata	32
Joshua tree	Yucca brevifolia	102
Mojave yucca	Yucca schidigera	107
Total		**1,830**

[1] Source: Summplemental Biotechnical Report: 2010 Botanical Survey
[2] Nevada portion of the proposed EITP that was surveyed included; around each existing and proposed tower site, proposed disturbance areas used for pulling sites, laydown areas, and telecommunication infrastructure
[3] The total area that was surveyed was 211 acres.

Wildlife

Based on desktop analysis and field surveys, several special-status wildlife species are known to occur or~~ have a very high potential~~ are likely to occur within the EITP (Tables 3.4-~~5~~ and 3.4-6 ~~3.4-3 and 3.4-4~~).

Reptiles

o a e op lation ese t To toise T T

The Mojave population of the desert tortoise (*ophe s agassi ii*) is currently listed as threatened by both the USFWS under the ESA (Federal Register 1990) and the State of California under the California Endangered Species Act (CESA; CDFG 2008b). The Desert Tortoise (Mojave Population) Recovery Plan (USFWS 1994) and the Draft Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*ophe s agassi ii*) (USFWS 2008) define recovery units, critical habitat, and management strategies for all desert tortoise populations in California and Nevada, among other states. The entire project is within the Northeast Mojave Recovery Unit and passes through the Piute-Eldorado Critical Habitat Unit in Nevada and the Ivanpah Critical Habitat Unit in California (Figure 3.4-2).

Desert tortoises occupy a variety of habitats, from flats and lower slopes dominated by creosote bush scrub at lower elevations to rocky slopes dominated by blackbrush and juniper woodland ecotones at higher elevations (USFWS 2008). Desert tortoises generally occur at elevations from below sea level in Death Valley, California, to 5,000 feet at Yucca Mountain, Nevada; however, presence at elevations up to 7,300 feet has been reported (USFWS 2008). In the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be friable enough for digging burrows, but firm enough so that burrows do not collapse. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as creosote scrub, often mixed with cacti, yucca, and other drought-resistant shrubs, such as white bursage and saltbush. These habitats tend to have a relatively high diversity of perennial plants and average annual precipitation ranges from 2 to 6 inches ~~5 to 20 cm~~ (USFWS 2008). The diet of the desert tortoise will vary depending on the seasonal availability of food. Tortoises prefer flowers of annual plants and grasses, but will also~~ assume~~ consume cacti and the vegetation of woody~~ herbs~~ plants. Desert tortoises reach reproductive maturity at 18 to 20 years of age. Tortoises typically lay eggs in late spring/early summer, and the eggs hatch 90 to 120 days later in late summer/early fall. Eggs are laid under several inches of sand near the mouth of the burrow opening.

The entire proposed project area falls within the range of the species, and most of the project areas provide suitable habitat for tortoises (Figure 3.4-2). In Nevada, the proposed transmission alignment would pass through approximately 8.3 miles of the Piute-Eldorado Critical Habitat Unit to the west of Eldorado Substation (Table 3.4-7 ~~3.4-6~~). In California, the proposed transmission alignment would not cross designated critical habitat.

In Nevada, the proposed redundant telecommunication line would cross approximately 11.8 miles of the Piute-Eldorado Critical Habitat Unit to the south of the Eldorado Substation (Figure 3.4-2, Table 3.4-7 ~~3.4-6~~). In California, the proposed redundant telecommunications line would cross approximately 3.1 miles of the Ivanpah Critical Habitat Unit between the California-Nevada state line and the proposed microwave tower site to the northeast of the town of Nipton. The proposed microwave tower site would also be located entirely within the Ivanpah Critical Habitat Unit for the desert tortoise. Both of the alternative redundant telecommunications line routes (Mountain Pass and Golf Course) would cross the Ivanpah Critical Habitat Unit in California. While in Nevada these two alternative redundant telecommunication routes are identical to the proposed route, the California segments differ significantly from the proposed route. Whereas the proposed redundant telecommunication route would cross approximately 3.1 miles of the critical habitat in California, the Golf Course alternative would cross approximately 12.9 miles of the Ivanpah Critical Habitat Unit, and the Mountain Pass alternative would cross approximately 12.8 miles of the Ivanpah Critical Habitat Unit (Figure 3.4-2, Table 3.4-7 ~~3.4-6~~).

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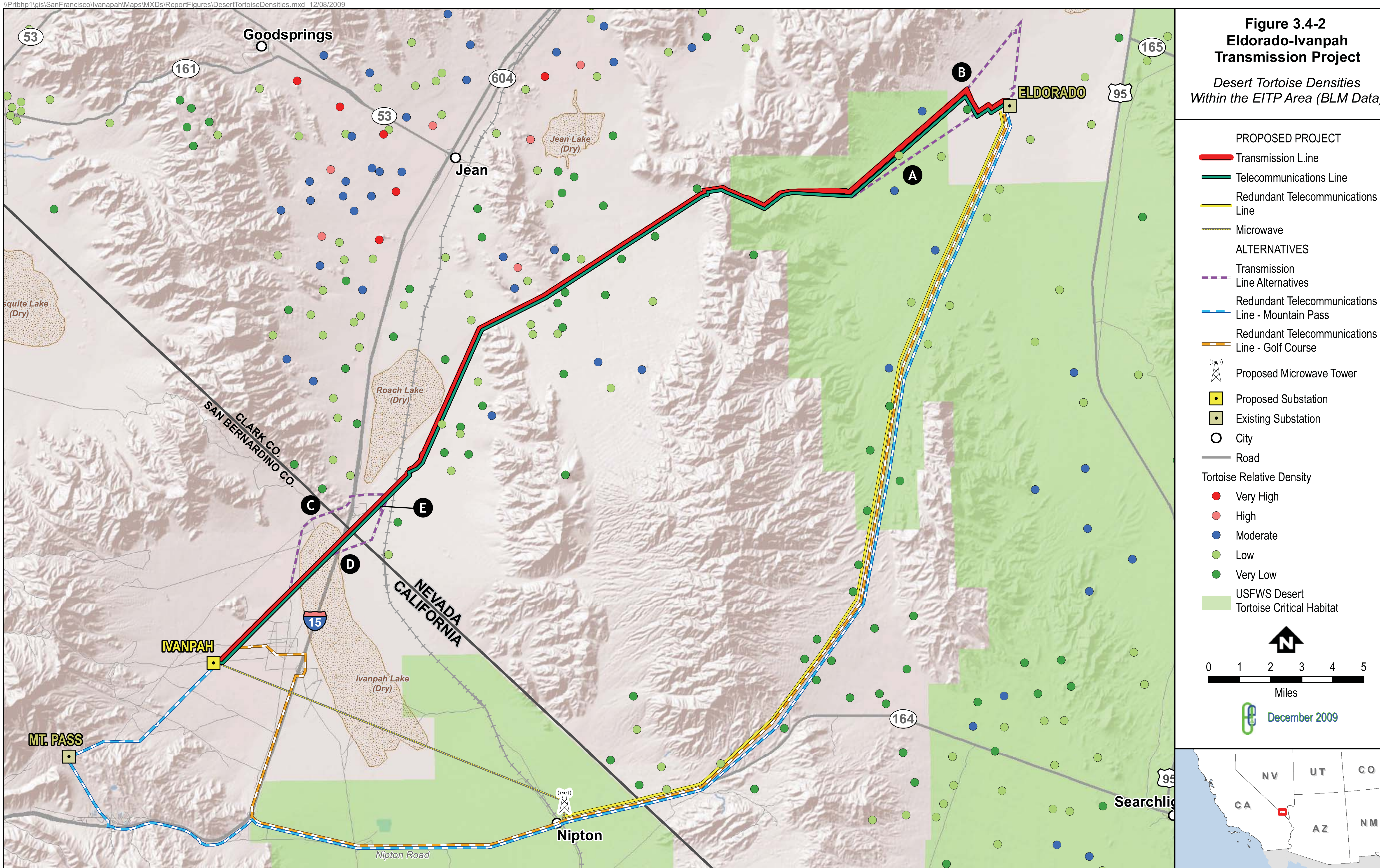

Figure 3.4-2
Eldorado-Ivanpah Transmission Project

Desert Tortoise Densities Within the EITP Area (BLM Data)

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Table 3.4-8 ~~3.4-6~~ Desert Tortoise Critical Habitat Crossed by EITP Components

Route	Critical Habitat Unit	State	Miles in Critical Habitat	Start MP	End MP	Difference between Alternative and Proposed Route (miles)[a]
Transmission Line Route (& primary telecommunications line)						
Proposed Transmission Route	Piute-Eldorado	NV	8.27	23.49	31.75	NA
Transmission Alternative Route A	Piute-Eldorado	NV	3.88[b]	0.00	3.88	-0.37
Redundant Telecommunication Line Route						
Proposed Redundant Telecommunication Route (NV)	Piute-Eldorado	NV	11.75	14.82	26.57	NA
Proposed Redundant Telecommunication Route (CA)	Ivanpah	CA	3.10	0.00	3.10	NA
Telecommunication Alternative Route (Mountain Pass) – west of Nipton, CA	Ivanpah	CA	12.80	13.58	26.39	9.70
Telecommunication Alternative Route (Golf Course) – west of Nipton, CA	Ivanpah	CA	12.88	8.91	21.79	9.78

Notes:
[a] A negative value indicates that this alternative route would decrease the total number of miles that the project feature would cross designated critical habitat for the desert tortoise.
[b] Transmission Alternative Route A traverses fewer miles of critical habitat when compared to the Proposed Transmission Route, however Alternative A Route would increase the amount of new disturbance to critical habitat, because the alternative would require 2.3 miles of new ROW.

Key:
MP = Milepost.

Almost the entire lengths of all proposed and alternative project features are located within suitable habitat for the desert tortoise, although there are several exceptions. Roach and Jean lakes (dry) are not considered suitable desert tortoise habitat, nor are the disturbed and developed areas associated with the town of Primm, Nevada. At higher elevations, neither the proposed telecommunication line near the southern end of the McCullough Range nor the Mountain Pass Telecommunication Alternative is optimal desert tortoise habitat.

During protocol-level desert tortoise surveys conducted in 2008, ~~and~~ 2009, and 2010, desert tortoises or associated sign (scat, burrows, shell fragments) were observed throughout most of the survey area with the exception of the developed and disturbed areas around Primm, Nevada, disturbed areas near the Molycorp Mine west of 1-15, the dry lake playas (Roach and Jean), and the higher elevation areas around Mountain Pass Substation. Desert tortoise densities were calculated for the proposed transmission route using the 100 percent coverage surveys conducted during 2008 and 2009 with the tortoise density calculator in the USFWS 2010 Desert Tortoise Pre-project Survey Guidance document. Based on this tool, tortoise density for the approximately 34.67 miles length of the proposed transmission line route was found to be approximately 5.2 tortoises per square mile. Historic desert tortoise densities in the Nevada portion of the proposed project area, as reported by the BLM, range from very low to moderate (Figure 3.4-2). ~~Desert~~ Density estimates for the proposed transmission route are lower than the 2007 density estimates for the adjacent Ivanpah Valley monitoring strata and for the adjacent Piute-Eldorado Valley monitoring strata, which are 16.9 tortoises per square mile and 10.9 tortoises per square mile, respectively (USFWS 2007). Historic desert tortoise densities for the California portion of the project were not reported by BLM. The desert tortoise 2008 survey results are an appendix to the Eldorado-Ivanpah Transmission Project Biological Technical Report (EPG 2009), while the 2009 and 2010 survey results are provided as ~~a~~ separate documents. The Biological Technical Report and the desert tortoise 2008 survey results are found in Appendix B-1 Biological Technical Report, and the 2009 and 2010 Desert Tortoise ~~Surveys~~ Reports are found in Appendix B-2 Desert Tortoise Surveys.

Gila Monster (BLM, S4, NRS 501)

The Gila monster (*elo e a s spe t* occurs in southern Nevada, extreme southwestern Utah, southern California, Arizona, and northern Sinaloa, Mexico (Beck 2005, Stebbins 2003). Gila monster populations in California are not currently faced with any immediate threat, but their numbers are very low, with only 26 credible records (from four counties) in the past 153 years (Beaman and Lovich 2007). In Nevada, the species occurs in Clark, Lincoln, and Nye counties (NNHP 2004).

Gila monsters prefer undulating rocky foothills, bajadas (shallow slopes under rocky hills), and canyons, and tend to avoid open sandy plains (Beck 2005). Brown and Carmony (1991) indicate that rough, rocky country is an important component of Gila monster habitat. Habitat of this type provides many 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 in providing shade and cover, but also in supporting larger populations of prey species.

Gila monsters use dry washes and their edges, as well as mesquite thickets, for foraging. 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). The daily timing of Gila monster activities varies according to season and locality, and generally shows a bimodal pattern (Beck 2005). The amount of surface activity is estimated to be low; in some locations Gila monsters 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 86 acres in Utah to 159 acres in Nevada (Beck 2005).

With respect to the proposed project area, potentially suitable Gila monster habitat occurs in the proposed project area in the rougher terrains on mountain slopes and in rocky canyons and ravines associated with the McCullough Range and Clark ~~mountains~~ Mountain Range. No Gila monsters have been observed in the project area to date, but they are unlikely to be observed due to their often crepuscular activity regime and limited time spent on the surface during the year.

Chuckwalla (BLM)

The chuckwalla (*a o al s ate*) 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 proposed project area where suitable rocky habitat is present. It was observed in the rocky terrain of the Lucy Gray Range and the McCullough Range during the biological surveys.

Western Banded Gecko (MSHCP)

With its soft, pliable skin, the western banded gecko (*oleony a iegat s*) 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 desert scrub habitats (Stebbins 2003). It feeds on a variety of arthropods, primarily insects (Degenhardt et al. 1996, Stebbins 2003). The western banded gecko is likely present within the proposed project area, and because it accepts various soil types and elevation, it could be present anywhere (Degenhardt et al. 1996).

Desert Iguana (MSHCP)

The desert iguana (*ipsosa s o salis*) 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. It will also eat insects and carrion (Ivanyi et al. 2000, Stebbins 2003). The desert iguana is likely to be present within the project area, particularly in creosote bush habitat. The species was documented at the proposed ISEGS site adjacent to the California segment of the project (BLM 2010).

Black Collared Lizard (MSHCP)

The black collared lizard (*otaphyt s ins la is*) tends to prefer rocky habitat with generally sparse vegetation but has been recorded in less rocky areas. It eats primarily insects but may also eat other lizard species and some plant materials (Stebbins 2003). The black collared lizard is likely not common within the project area, but it would most likely be found along the ROW that passes through the McCullough Range where the terrain is hillier and some rocks are present. The species was documented at the proposed ISEGS site near the California segment of the proposed project (BLM 2010).

~~*Western Banded Gecko (MSHCP)*~~

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~~*Black Collared Lizard (MSHCP)*~~

~~The black collared lizard (*otaphyt s ins la is*) tends to prefer rocky habitat with generally sparse vegetation, but has been recorded in less rocky areas. It eats primarily insects, but will take other lizard species and some plant materials (Stebbins 2003). The black collared lizard is likely not common within the project area, but it would most likely be found along the ROW that passes through the McCullough Mountains where the terrain is hillier and some rocks are present. The species was documented at the proposed ISEGS site near the California segment of the proposed project (CEC 2008).~~

Long-nosed Leopard Lizard (MSHCP)

The long-nosed leopard lizard (*a belia isli enii*) 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 (*te isia* 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 within the EITP area. Its presence in the creosote bush habitat at the bases of the mountains would be expected. The species was documented at the proposed ISEGS site adjacent to the proposed project (~~CEC 2008~~ BLM 2010).

Desert Horned Lizard (MSHCP)

Desert horned lizard (*h ynoso a platy hinos*) occurs in arid regions that have at least some loose soil available for burrowing. Desert horned lizard is generally found in areas with sandy soils and limited vegetation such as sagebrush or shadscale. This species could occur anywhere within the project area.

Western Leaf-nosed Snake (MSHCP)

The Western leaf-nosed snake (*hyllo hyn h s e tat s*) is found 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. This snake occurs in desert scrub habitat, and is typically associated with areas where creosote bush is dominant. Its principal foods are various species of lizards including the western banded gecko (Stebbins 2003). The Western leaf-nosed snake is likely to be present within the proposed project area where creosote bush is the dominant plant. This snake probably would be present where the project would pass through the McCullough Range or Clark ~~mountains~~Mountain Range.

Glossy Snake (MSHCP)

The glossy snake (*i ona 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 and diamondback rattlesnakes (*otal s i i is* and *at o* , respectively; Degenhardt et al. 1996). It eats primarily lizards, but snakes, small mammals, and birds are also taken (Degenhardt et al. 1996, Stebbins 2003). The glossy snake may be present anywhere within the EITP area.

Common Kingsnake (MSHCP)

The common kingsnake (*a p opeltis get la*) is present through a wide range of habitats and elevations, from sea level to near 7,000 feet (Degenhardt et al. 1996, Stebbins 2003). In desert habitats it uses rock shelters, animal burrows, or manufactured structures to escape high temperatures and low humidity (Degenhardt et al. 1996). It feeds primarily on other snake species, but also consumes lizards, frogs, birds, and eggs of reptiles and birds (Degenhardt et al. 1996, Stebbins 2003). The common kingsnake is likely to occur within the proposed project area and is more likely to be found in the mountainous areas of the corridor than in the creosote bush-dominated flats.

Long-nosed Snake (MSHCP)

The long-nosed snake (*hino heil s le ontei*) 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 it 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 within the proposed project area among low shrubby vegetation where the project would cross the Clark Mountain Range and McCullough ~~mountains~~ Range.

Lyre Snake (MSHCP)

The range of the lyre snake (*T i o pho on bis tat s*) barely extends into southern Nevada. This snake tends to prefer the steeper slopes and rocky terrain of canyons and arroyos, but may occasionally be encountered on valley floors (Degenhardt et al. 1996, Stebbins 2003). It may occur in a variety of vegetation types from sea level to almost 8,000 feet in elevation (Stebbins 2003), and it preys 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). No lyre snakes were observed during surveys; however, their presence within the proposed project area is possible.

Speckled Rattlesnake (MSHCP)

The speckled rattlesnake (*otal s it hellii*) prefers rocky habitats, but may also occur in areas of non-cohesive soils and sandy habitats. The speckled rattlesnake is present in creosote bush, succulent desert, thornscrub, and ~~pinion~~ pinyon-juniper woodland habitats. This rattlesnake preys primarily on small mammals, birds, and lizards (Stebbins 2003). The speckled rattlesnake is likely to be present anywhere within the EITP, and is not likely to be restricted to any specific habitat type.

Sidewinder (MSHCP)

Usually less than 3 feet in length, the sidewinder (*otal s e astes*) is not a large snake. It is usually found in areas of aeolian sands where plants such as creosote bush or mesquite have developed mounds 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 principal prey of the sidewinder are rodents and lizards, but birds may also be taken (Stebbins 2003). The sidewinder is likely to be present within the proposed project area in areas of loose sand, and may be present on upper mountain slopes. 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 ISEGS site (~~CEC 2008~~ BLM 2010).

Mojave Rattlesnake (MSHCP)

The Mojave rattlesnake (*otal s s t lat s*) 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 where loose, sandy soils are prevalent.

Mammals

Desert Bighorn Sheep (BLM, S3)

The subspecies of desert bighorn sheep that is present in the proposed project area (Nelson's bighorn sheep) occurs in the Southwest desert regions of the United States. The sheep is classified by the CDFG and NDOW as a big game mammal, and annual hunting seasons allow for a very limited take. The Clark Mountain~~s~~ Range and the entire proposed project ROW in California are in the CDFG Zone 3 for desert bighorn sheep hunting, while the McCullough ~~Mountains~~ Range 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.

Desert bighorn are creatures of rugged, open, mountainous terrain where adequate forage, water, and escape terrain are available. Steep slopes and cliffs are used to escape from predators. The Nelson subspecies has become well adapted to the desert mountain environment. It is typically found in small bands in areas with little or no permanent water, although it does require access to surface water (Wehausen 2006). Its diet consists of grasses, forbs, and sedges. Mating may take place at any time in the desert if climatic conditions are suitable. The gestation period is about 180 days. Decline of the species can be attributed to degradation of habitat due to development, road-building, water-management practices, and recreational activities. The bighorns are also highly susceptible to various diseases, e.g., bacterial pneumonia (Pasteurellosis), sometimes passed on to them by domestic sheep, and they are often preyed upon by mountain lions, coyotes, and likely by domestic dogs. High predation by mountain lions has been documented in the Clark Mountain~~s~~ Range (Wehausen 2006). Drought-induced mortality can also occur if edible food sources decline or if there is competition for surface water with humans and other large mammals (i.e. cattle or burros).

Within the proposed project area in California, Nelson's bighorn is found in the rugged, upland topography associated with the Clark Mountain Range. Specific to the Nevada segment of the project, desert bighorn sheep are present in the McCullough Range, including the north McCullough Pass area through which the proposed transmission line alignment would pass (Figure 3.4-3). Bighorn were observed along the transmission line alignment in the north McCullough Pass area during surveys. Within the McCullough range are bighorn special use areas (lambing areas and summer grounds) that are of concern to wildlife and land managers. Lambing grounds are generally at higher elevation in mountain ranges where ewes go in the winter or spring to drop their lambs. The higher, less accessible terrain may afford the ewes and lambs greater protection from certain predators, such as coyotes. The EITP intersects potential lambing grounds within the McCullough Pass (Figure 3.4-3). Summer grounds are areas of the mountain range sheep occupy during the hot summer months. Summer grounds must provide adequate forage and be close enough to water. The only water development in the McCullough ~~Mountains~~ Range available to bighorn sheep in summer is the "Linda" guzzler (a manufactured water storage device), approximately 1.3 miles north of the McCullough Pass.

Wild Burros (WHBA)

The wild burro receives protection under the 1971 federal Wild Free-Roaming Horses and Burros Act (WHBA; 16 USC 1331-1340). The act protects wild horses (*s aball s*) and burros within designated allotments on lands administered by the United States Forest Service (USFS) 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 (under the ESA) or the states of California or Nevada. The California Fish and Game Code (Section 4600) provides additional protection for these animals (MacDonald 2006).

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 in the proposed project area in California. Although no burros were identified during field surveys, recent burro scat was observed on the west edge of Ivanpah Dry Lake.

American Badger (BLM, S4)

The American badger (*Ta i ea ta s*) is frequently found on the flats and alluvial fans next to desert mountains (Hoffmeister 1986). It occupies a diversity of habitats, particularly with the following elements: sufficient food -friable soils, and relatively open uncultivated land. It will eat small mammals and burrowing rodents, wood rats (*eoto a* spp.), reptiles, birds and their eggs, and bees and other insects (CDFG 1986).

Badger populations have declined drastically, particularly in California. Urban and agricultural development has had the greatest detrimental effects on badgers. They have been targets of deliberate killing for many years, and have suffered from rodent and predator poisoning (CDFG 1986).

A badger was observed near the Eldorado Substation during project surveys, and badgers were observed during field surveys for the ISEGS (~~CEC 2008~~ BLM 2010), which is proximal to the project area. Badgers are more likely to occur on upper bajadas, such as the bajada east of Mountain Pass Substation, where greater plant species diversity and cover provides better habitat for prey species.

Desert Kangaroo Rat (MSHCP)

Desert kangaroo rat (*ipo o ys ese ti*) live in sand dunes in very hot, dry deserts of the southwestern United States, even below sea level in Death Valley, California. Desert kangaroo rat require deep sand for their burrow, and will not dig them in rapidly shifting sand. They could occur anywhere within the project area.

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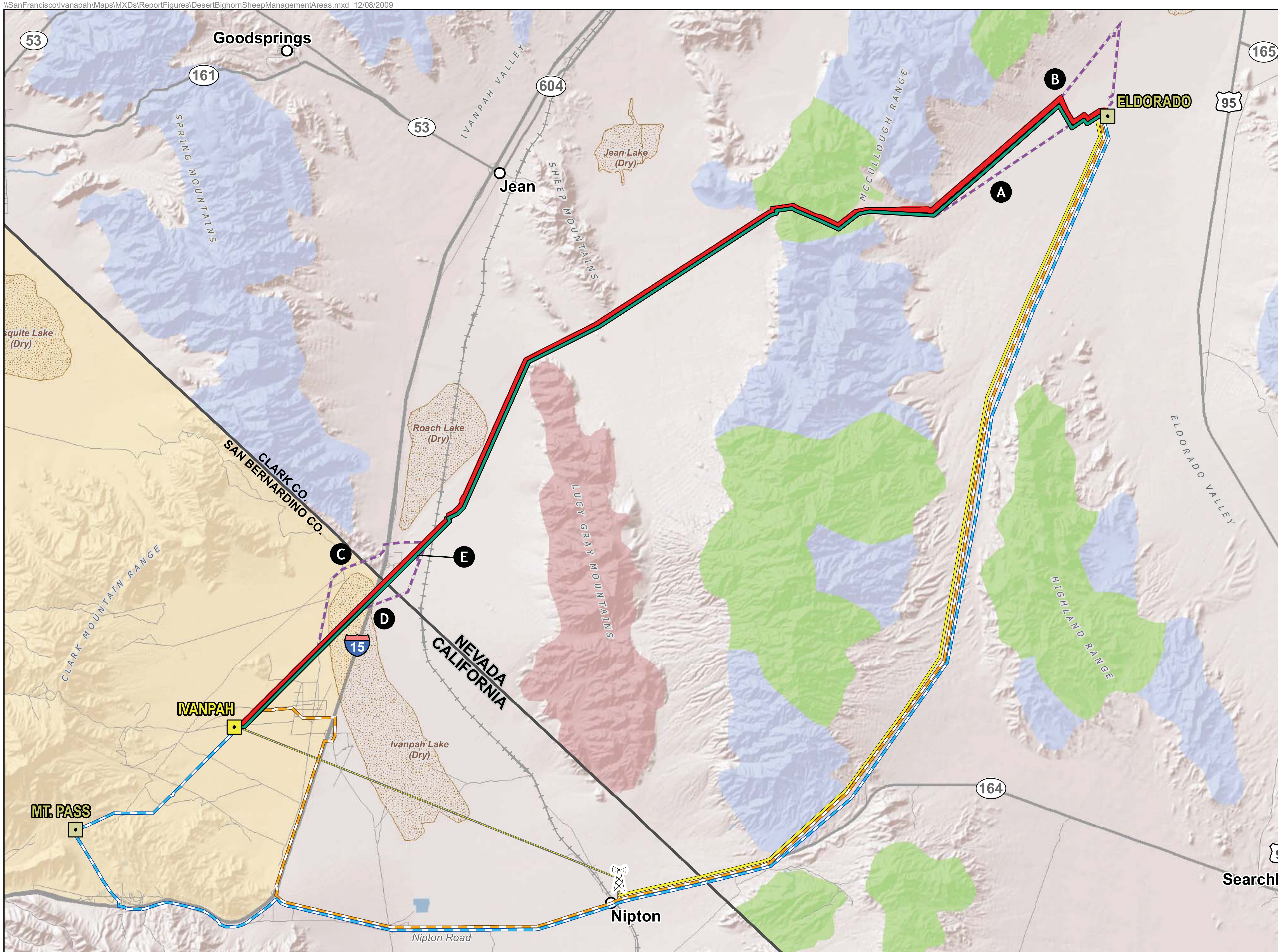
Figure 3.4-3
Eldorado-Ivanpah Transmission Project

Desert Bighorn Sheep Management Areas



PROPOSED PROJECT

- Transmission Line
- Telecommunications Line
- Redundant Telecommunications Line
- Microwave

ALTERNATIVES

- Transmission Line Alternatives
- Redundant Telecommunications Line - Mountain Pass
- Redundant Telecommunications Line - Golf Course

- Proposed Microwave Tower
- Proposed Substation
- Existing Substation
- City
- Road

Bighorn Sheep Habitat

- Crucial Habitat (Includes Potential Lambing Areas)
- Historically Unoccupied
- Winter Range
- CDFG Zone 3

N

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Miles

December 2009

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Desert Pocket Mouse (MSHCP)

Desert pocket mouse (*haeto ip s peni illat s*), a medium-sized pocket mouse, occurs in the southwestern United Sates and northern Mexico. Desert pocket mouse is found in various arid, open desert environments, usually where the vegetation is rather sparse. These may include desert wash, desert succulent shrub, desert scrub, and alkali desert scrub. Desert pocket mouse prefers soft alluvian, sandy, or silty soils along stream bottoms, desert washes, and valleys, rather than rocky terrain. These pocket mice live in soils that may be populated by creosote bush, cholla, palo verde, burroweed, mesquite, cacti, and short, sparse grass, as well as in lower edges of alluvial fan with yucca, mesquite, grama, and prickle poppy (Chebes 2002). This species could occur anywhere within the project vicinity.

Kit Fox (MSHCP)

The kit fox (*lpes a otis*) primarily occur in the southwestern part of the United States and northern and central Mexico. Kit foxes are primarily found in arid regions, such as desert scrub, chaparral, and grasslands; they may also occur in agricultural areas and urban environments. Kit foxes prefer areas with loose soils for constructing dens (Patton and Francl 2008). This species may occur within the project area at any time.

California Leaf-nosed Bat (BLM, ART)

The California leaf-nosed bat (*a ot s alifo ni s*) is primarily a resident of caves and mines in desert scrub habitat, generally below 3,280 feet in elevation (Hoffmeister 1986, Western Bat Working Group [WBWG] 2005). These bats use a variety of night roosts, such as open buildings, porches, bridges, rock shelters and mines (Harvey et al. 1999). The California leaf-nosed bat feeds on large night-flying and terrestrial insects, and sometimes fruit, including those of cacti (Hoffmeister 1986). There is evidence that a California leaf-nosed bat may use the same roost throughout its life (Brown et al. 1993). It does not forage far from its roost. 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). Threats to this species include mine closures, vegetation removal, vandalism at roosts, and prolonged exposure to low temperatures (Brown et al. 1993).

The 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), and the species could occur where suitable mine or cave roost habitat is present. There is ~~very~~ little evidence of historic mining on Clark Mountain, Sheep Mountain, in the Lucy Gray Mountains, or in the north McCullough Pass area. Mine shafts suitable for bat roosts are unlikely to be present in these areas. Large solution pockets or small caves on Sheep Mountain and eroded pockets in igneous strata in the Lucy Gray and McCullough ~~mountains~~ Range 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 McCullough ~~Mountains~~ Range and the north end of the New York Mountains near the Big Tiger Wash and Nevada State Highway 164. Numerous abandoned mine shafts in that area may contain suitable roosting habitat for this species. The status of these features as habitat is not known.

California Myotis (BLM, ART)

The California myotis (*yotis alifo ni s*) roosts in a variety of habitats including in rock crevices, under loose bark and within holes in trees, in buildings, and occasionally in caves or mines (Harvey et al. 1999, Hoffmeister 1986). It is primarily a resident of desert scrub habitats, but occurs as high as the lower edge of conifer zones, though rarely above 6,000 feet. In the southwestern deserts, it usually occurs near a water source, often in rocky riparian canyons (Barbour and Davis 1969, Hoffmeister 1986).

There is only marginally suitable habitat present in the project area in Nevada that may support this species. It would be most likely to occur within the project limits during nocturnal foraging activity.

Townsend's Big-eared Bat (BLM, ART)

Townsend's big-eared bat (*o yno hin s to nsen ii*) occurs throughout the western United States west of the Great Plains, north into British Columbia, and south to Oaxaca in Mexico (BCI 2008, Harvey et al. 1999). The pale Townsend's big-eared bat (*o yno hin s to nsen ii palles ens*) is restricted to the desert southwest (Barbour and Davis 1969), and is the subspecies that would occur within the vicinity of the proposed project. This species normally roosts in mines or caves, and typically returns 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). It prefers moths to other prey (WBWG 2005).

Townsend's big-eared bat would be likely to use habitats similar to those attractive to the California leaf-nosed bat. The abandoned mines in the Big Tiger Wash area would be the most likely place for this species to occur within the EITP area.

Big Free-tailed Bat (BLM, ART)

The big free-tailed bat (*y tino ops a otis*) is found in 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). It is apparently uncommon within its range in the United States in general, but may be locally common 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 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, in 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. Its presence within the project area would likely be limited to nocturnal foraging activities.

Birds

The project provides foraging and nesting habitat for bird species, including raptors. Given the higher elevation and greater diversity (species and structure) in the plant community at Mountain Pass and on the southern portion of the existing Eldorado–Lugo transmission line, it may be that these areas are used more by ~~transient~~ migrating individuals, summer ~~visitor~~ residents, and permanent resident birds than are lands to the north, south, and east. Bird nesting could occur within vegetation (particularly shrubby plants and cacti species), in ground burrows, in cliffs and crevices associated with surrounding mountain ranges, and potentially on project facilities such as existing poles and towers. In the proposed project vicinity, the ~~avian~~ nesting season for most bird species is from late February to early July. There is a general lack of natural potential roosting and nesting habitat for raptors along most of the proposed project route. Some potential nesting habitat is found in the Clark Mountain~~s~~ Range near the Mountain Pass Substation, where there are rocky cliffs and a few ~~pinion~~ pinyon pine, and potential nesting habitat in the north McCullough Pass area where rocky terrain might support cliff nesting species. Electrical transmission line lattice towers probably provide most of the potential raptor nesting habitat in the area. A pair of red-tailed hawks was observed constructing a nest in a lattice tower in the east foothills of the Clark Mountain~~s~~ Range, and a second stick nest was also observed in a tower in this vicinity during 2008 surveys. Biologists also observed a red-tailed hawk nest along the proposed transmission route near within the McCullough Range during the 2008 surveys. A single stick nest was observed along the Eldorado-Lugo telecommunication route during the 2010 raptor nest surveys, and was determined to most likely be a common raven nest. No raptor nests were observed in any 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~~ crows returning to an area annually. The nests are generally persistent on the towers for years.

Golden Eagle (BLM, FPS)

The golden eagle *ila h ysaetos* 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). It nests on cliffs, large or small trees, and sometimes telephone poles (Glinski 1998). The golden eagle feeds primarily on mammals, preferring rabbits (*ep s* 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). Preferred nesting habitat for the golden eagle is rugged mountains and canyons with little human disturbance. They use cliff faces and ledges for perching and nest cover.

~~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 area. 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 alignment.~~

Suitable nesting habitat for the golden eagle is present in the Clark Mountain Range, McCullough Range, and Highland Range (east of the proposed project), primarily in rockier areas at higher elevations. This habitat is fairly limited in extent within the project area. A review of golden eagle historic and current occurrences compiled by NDOW identifies two sightings of golden eagle nests in Nevada within ten miles of the proposed project.There is a nesting record for the Highland Range east of the Eldorado–Lugo alignment and another record in the McCullough Range to the northwest of the proposed transmission line (NDOW 2010). There is also a known active golden eagle breeding territory in the Clark Mountain Range, as reported in the ISEGS environmental document that is located approximately 4.3 miles from the proposed ISEGS site (BLM 2010). Two other inactive breeding territories were found in the Clark Mountain Range east of the project area (BLM 2010). Golden eagle territories are quite large and eagles are thought to forage up to ten miles from the nest within breeding territories in arid environments (USFWS 2010).

~~The project area as a whole is quite open, and provides suitable hunting habitat for the golden eagle. The golden eagle was recorded near the Ivanpah Substation site during project surveys and during surveys for the ISEGS site in 2008 (CEC 2008).~~

The project area as a whole is open and provides suitable hunting and forage habitat for the golden eagle with the exception of developed and paved areas. The golden eagle was recorded near the Ivanpah Substation site during the reconnaissance survey and just south of the Eldorado Substation along the existing Eldorado–Lugo transmission line during the 2010 raptor survey, as well as during surveys for the ISEGS site in 2008 (BLM 2010).

Burrowing Owl (BLM, NRS 501)

Burrowing owls (*thene ni la ia*) use a variety of habitat types, including shortgrass prairie, open scrublands of mesquite (*osopis* spp.), creosote bush, or rabbit-brush (*h ysotha n s* spp.), as well as 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. It is semi-colonial and usually occupies burrows excavated by small mammals, often at the edges of active colonies of prairie dogs (*yno ys* spp.) or ground squirrels. In areas that lack colonial burrowing mammals, burrowing owls will use excavations made by other animals such as badgers, woodchucks (*a ota ona*), skunks, foxes, armadillos (*asyp s no e in t s*), coyotes (*anis lat ans*), and tortoises. It may also use natural cavities in rocks and openings in human-made structures. In addition to the nest burrow it may also use several satellite burrows that may provide protection from predators and parasites (Dechant et al. 1999). Burrowing owls in the western United States do not dig their own burrows; 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 part of the eastern Mojave Desert that includes the project area (CNDDB 2008, Institute for Bird Populations 2008, State of California 2008, Bates 2006). Suitable habitat for burrowing owls is present in areas throughout the project, particularly where animal burrows, especially those of desert tortoise, are common. ~~A burrowing owl was observed along Transmission Alternative Route C during project surveys. They were also observed on the adjacent proposed ISEGS site (CEC 2008).~~ Burrowing owl sign (i.e., pellet) was observed along Transmission Alternative Route C in California during project surveys. Burrowing owls were observed on the adjacent proposed ISEGS site (BLM 2010). No burrowing owls were observed during the 2010 raptor surveys, although non-protocol methods were employed for burrowing owls.

Crissal Thrasher (S3)

Crissal thrasher (*To osto a issale*) is known to occur in both San Bernardino County, California, and Clark County, Nevada. Habitat includes a range of desert scrublands, mesquite thickets along washes, and chaparral environments (AOU 1983). Nesting occurs in large shrubs or low trees generally less than 8 feet above the ground. This species feeds primarily on insects, but will eat berries and seeds and occasionally take small lizards (Terres 1980). The species is uncommon throughout its range and is abundant only where large segments of mesquite bush occur, such as along the Colorado River (CDFG 2009). Therefore, the primary threat to this species is loss of preferred ~~mesquite thicket~~ breeding habitat within vegetation thickets along desert washes and watercourses.

This species could occur in the desert wash habitats within the project area in California and Nevada.

LeConte's Thrasher (BLM)

LeConte's thrasher (*To osto a le ontei*) 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 were observed during project surveys north of Primm, Nevada, near Roach Lake. LeConte's thrashers are very likely to occur in other areas throughout the project, mostly on the lower bajadas, where vegetation is sparse and where chollas provide suitable nesting sites.

Peregrine Falcon (BLM, NRS 501)

Peregrine falcons (*al o pe eg in s*) 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 is known to occur in the project vicinity (Floyd et al. 2007), as the project area contains both suitable open areas for foraging and suitable nesting habitat in the form of cliff ledges within the McCullough ~~Mountains~~ Range. An incidental siting of the peregrine falcon was recorded along the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line near Primm, Nevada during the 2010 raptor survey.

Prairie Falcon (BLM)

The prairie falcon (*al o e i an s*) 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 use an old avian nest or scrape together soil, rocks, and sticks (Dawson 1998, Wheeler 2003). The nests may be reused annually for many years (Wheeler 2003).

The prairie falcon may occur in the vicinity of the McCullough ~~Mountains~~ Range, but there are no records of the species breeding in the range (Floyd et al. 2007). The project area contains both suitable open areas for foraging and suitable nesting habitat within the McCullough ~~Mountains~~ Range. The prairie falcon prefers to nest on cliff faces using ledges, cavities, or crevices and will also lay eggs in abandoned stick nests of eagles, hawks, or ravens (Steenhof 1998). The prairie falcon was incidentally sited along the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115 kV transmission line near Eldorado Substation during the 2010 raptor survey.

Phainopepla (BLM, NRS 501)

The phainopepla (*hainopepla nitens*) is a member of the silky flycatcher family, *tilogonati ae*, a primarily tropical family of birds. The phainopepla feeds on a variety of berries and insects. In desert scrub habitats, mesquite mistletoe berries are an important food source, and are an attractant to the species. In other areas they feed on juniper, elderberry (*a b s* spp.), grape (*itis* spp.), buckthorn (*ha n s* spp.), Russian olive (*laeagn s ang stifolia* L.), 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 desert scrub or mesquite habitat. As the warmer weather approaches, the phainopepla moves to higher elevations into ~~pinion~~ pinyon-juniper or oak (*e s* 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~~ Range (Floyd et al. 2007).

The creosote bush-white bursage habitat on much of the project is mostly unfavorable to the presence of phainopeplas. Very few trees are 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. One individual was observed within McCullough Pass, and the second was observed along the proposed telecommunication line.

Loggerhead Shrike (BLM)

The loggerhead shrike (*ani s l o i ian s*) 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, ~~pinion~~ pinyon-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 probably nests in the McCullough ~~Mountains~~ Range (Floyd et al. 2007).

Loggerhead shrike~~s~~ have been observed on the California and Nevada segments of the project. Several observations were made just west of the slopes of the McCullough ~~Mountains~~ Range.

Gray *Vireo* (MSHCP)

Gray Vireo (*i eo i inio*) is a sub-foraging inhabitant of some of the hottest, most arid regions of the southwestern United States and adjacent parts of northwestern Mexico (Barlow Sheridan and Colette 1999). It is associated with scrub vegetation and chaparral in mountains and high plains scrubland. This species could occur within the California and Nevada portions of the project.

Scott's *Oriole* (MSHCP)

Scott's oriole (*te s pa iso*) is found in desert grassland prairies and mountain canyons, particularly if yucca or palms are present. This species nests in pinyon-juniper woodlands, sycamores, and cottonwoods and forages for insects on the ground or in yuccas and other trees close to the ground. The size of their territory has not been studied extensively; however, it is generally believed to be large, depending on the availability of appropriate habitat (Gartland 2006). Scott's oriole has limited potential to occur along the proposed transmission line and alternative routes in California and Nevada.

Cactus Wren (MSHCP)

Cactus wren (Campylorhynchus brunneicapillus) primarily inhabit areas that are desert or semi-desert, such as Joshua tree woodland in the Mojave Desert; they also live along arid hillsides and locales that provide them with vegetation such as spiny cacti and cholla, which are used for nesting. Declines in population have been correlated to urbanization, although the species less affected by development when nest-site alternatives are available (California Partners in Flight 2009). Cactus wren has ~~limited~~ potential to occur along the proposed transmission line and alternative routes.

3.4.1.2 ~~Wildlife~~General Resource Conditions and Management Areas

Big Game Ranges/Wintering Areas

Nelson's bighorn sheep, also known as desert bighorn sheep, is the only big game species likely to occur within the project area. Habitat connectivity is important for maintaining sustainable populations for this species, and any boundaries or obstacles that restrict access between mountain ranges or to surface water can impede natural colonization. Bighorn, especially rams, will move between mountain ranges if the distance of flat open desert to be crossed is not great and their route between ranges is not bisected by intense human activity such as freeways. Ewes generally tend to be more sedentary and long movements by ewes between mountain ranges are unusual.

As described previously, the Clark Mountain~~s~~ Range provides occupied suitable habitat for the bighorn. Additionally, the BLM Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands identifies the McCullough ~~Mountains~~ Range as a Category II (Crucial Habitat) area, where wintering areas and potential lambing areas are located in the mountain range. Figure 3.4-3 illustrates bighorn sheep management areas within the EITP 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 miles south-southeast of the proposed transmission line alignment through the McCullough ~~Mountains~~ Range). 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 transmission line, which would 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 may also be present on Sheep Mountain and the Lucy Gray Mountains, and may use the valley between the two ranges during movements. The existing transmission line ROW passes between these two ranges east of I-15 and north of Primm, Nevada. Further south of this area, I-15 is likely a movement barrier between the west and east sides of the project area for bighorn sheep.

Areas of Special Management ~~Areas~~ Consideration

Components of the project traverse a number of areas requiring special management considerations.

BLM Areas of Critical Environmental Concern, Desert Wildlife Management Areas, and Wilderness Areas

Critical areas have been established at various times by the BLM for the conservation and recovery of certain species (e.g., desert tortoise), unique biological habitats, and non-biological resources such as cultural resources. These are known as Desert Wildlife Management Areas (DWMAs) and Areas of Critical Environmental Concern (ACECs). ~~The Clark Mountain ACEC was designated under the California Desert Conservation Act (CDCA) Plan of 1980 (described further in Section 3.4.2, "Applicable Laws, Regulations, and Standards") 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 resources values.~~ These areas are designated as they have significant endemic plant species, plant communities, diverse wildlife elements, and cultural resources values. The Clark Mountain ACEC is just west and north of the Mountain Pass Substation. The proposed project or alternatives would not cross the Clark Mountain ACEC. However, the project does cross the Ivanpah DWMA ACEC and the Puite-Eldorado ACEC. The USFWS (2008c) maps critical habitat for the desert tortoise in all of these ACECs. Figure 3.4-4 depicts ACECs within the EITP.

The BLM manages several wilderness areas as part of the National Wilderness Preservation System. No vehicles or motorized equipment are allowed within these designated wilderness areas. The Wee Thump Joshua Tree Wilderness Area was established in 2002 and has a total of 6,050 acres (BLM 2009a). This wilderness was established to protect the dense stand of Joshua trees present in the flat, alluvial plain that is co-dominated by creosote and blackbrush. The wilderness provides habitat for desert tortoise and an unusually diverse group of cavity-nesting birds and birds finding winter refuge. The South McCullough Wilderness Area is a larger area comprised of various vegetation habitats (creosote scrub, yucca and cacti, Joshua trees, and ~~pinion~~ pinyon-juniper at higher elevations). The wilderness provides habitat for chukar, desert tortoise, and desert bighorn sheep (BLM 2009b). The proposed telecommunication route ~~(Path 2, Sections 1 and 2)~~ runs in between, but not across, the South McCullough and Wee Thump Joshua Tree wilderness areas (Figure 3.4-4). The boundaries of these wilderness areas directly abut the proposed telecommunication ROW.

Mojave National Preserve

Mojave National Preserve covers 1.6 million acres and is located in California east of Barstow between I-15 and I-40, stretching to the Nevada border. Established in 1994, the preserve is managed by the National Park Service to "preserve unrivaled scenic, geologic and wildlife values associated with these unique natural landscapes" (California Desert Protection Act 1994). The proposed project directly borders, but is not in, the Mojave National Preserve. The project would be separated from the preserve by Nipton Road in eastern San Bernardino County (NPS 2009; Figure 3.4-4).

Boulder City Conservation Easement

The Clark County Desert Conservation Program (DCP) purchased the Boulder City Conservation Easement (BCCE) from Boulder City in 1995 to exact protections and provide conservations for the desert tortoise, other species, and their habitat (Clark County 2007). The BCCE is a high priority conservation area in which development activity is severely limited with only passive use allowed (hiking, driving slowly on designated routes, and sightseeing) (Clark County 2000), with the exception of approved activities in designated corridors. Only existing uses of historical easements are permitted, and expansion or significant modification to these uses is not allowed (Wainscott, personal communication 2009; Kokos, personal communication 2009). The DCP manages the BCCE through policies outlined in the Interlocal Agreement (as amended), and the City of Boulder City maintains the right to approve land uses within the area.

Portions of the BCCE are designated as critical habitat for the desert tortoise by the USFWS, while the remaining portion of the BCCE is considered the equivalent of USFWS-designated critical habitat by Clark County planners (Wainscott 2009; Kokos 2009). Clark County considers the BCCE as part of the mitigation and conservation reserve for the Clark County Multiple Species Habitat Conservation Plan (MSHCP), but does not regulate the BCCE area; nor does the MSHCP supersede the BCCE agreement.

The northeastern portion of the proposed project (i.e., transmission and telecommunication routes) would fall within and outside an existing utility corridor crossing the BCCE just east of the McCullough Pass area (Figure 3.4-4). The proposed transmission route follows a 2,000-foot-wide utility corridor along its southernmost edge from the western side of the BCCE until it deviates outside of the BLM corridor into the BCCE in a southerly direction for less than one mile at MP 2 along an existing 70-foot ROW (see Figure 3.9-3 in Section 3.9, "Land Use"). The line then re-enters an adjacent 3,000-foot-wide BLM corridor, continues to the northeast, and terminates at the Eldorado Substation. Transmission Alternative Route A would begin at the same point-of-entry into the BCCE as the proposed route but follow the adjacent 3,000-foot-wide BLM corridor to the Eldorado Substation. Transmission Route Alternative B would continue north in the 2,000-foot-wide corridor instead of turning south at MP 2. Alternative B would then make a sharp right turn at the intersection between the 2,000- and 3,000-foot-wide corridors and continue south to the Eldorado Substation. Neither Transmission Route Alternatives A or B would deviate outside of BLM-designated corridors.

Unusual Plant Assemblages

Unusual plant assemblages are specific types of plant communities that are given special protection designations within the California Desert Conservation Act (CDCA) Plan (BLM 1980). These assemblages include riparian areas, which provide a unique niche of vegetation and moisture conditions within the dry desert landscape. Loss of riparian areas within the project area could impact plants and wildlife in the area, which is particularly important for special-status species. Riparian corridors only occur within the Nevada portions of the project area in the McCullough Pass area and along portions of the Eldorado-Lugo telecommunications line area.

Wildlife Corridors/Linkages

A wildlife corridor is defined as a linear landscape feature that allows animal movement between two patches of habitat or between habitat and geographically discrete resources such as water. Connections between extensive areas of open space are integral to maintaining regional biological diversity and population viability. Areas that serve as wildlife movement corridors are considered biologically sensitive because they facilitate the persistence of special-status species. In the absence of corridors, habitats become fragmented, isolated islands surrounded by development. Fragmented habitats support much lower numbers of species and increase the likelihood of extinction for select species.

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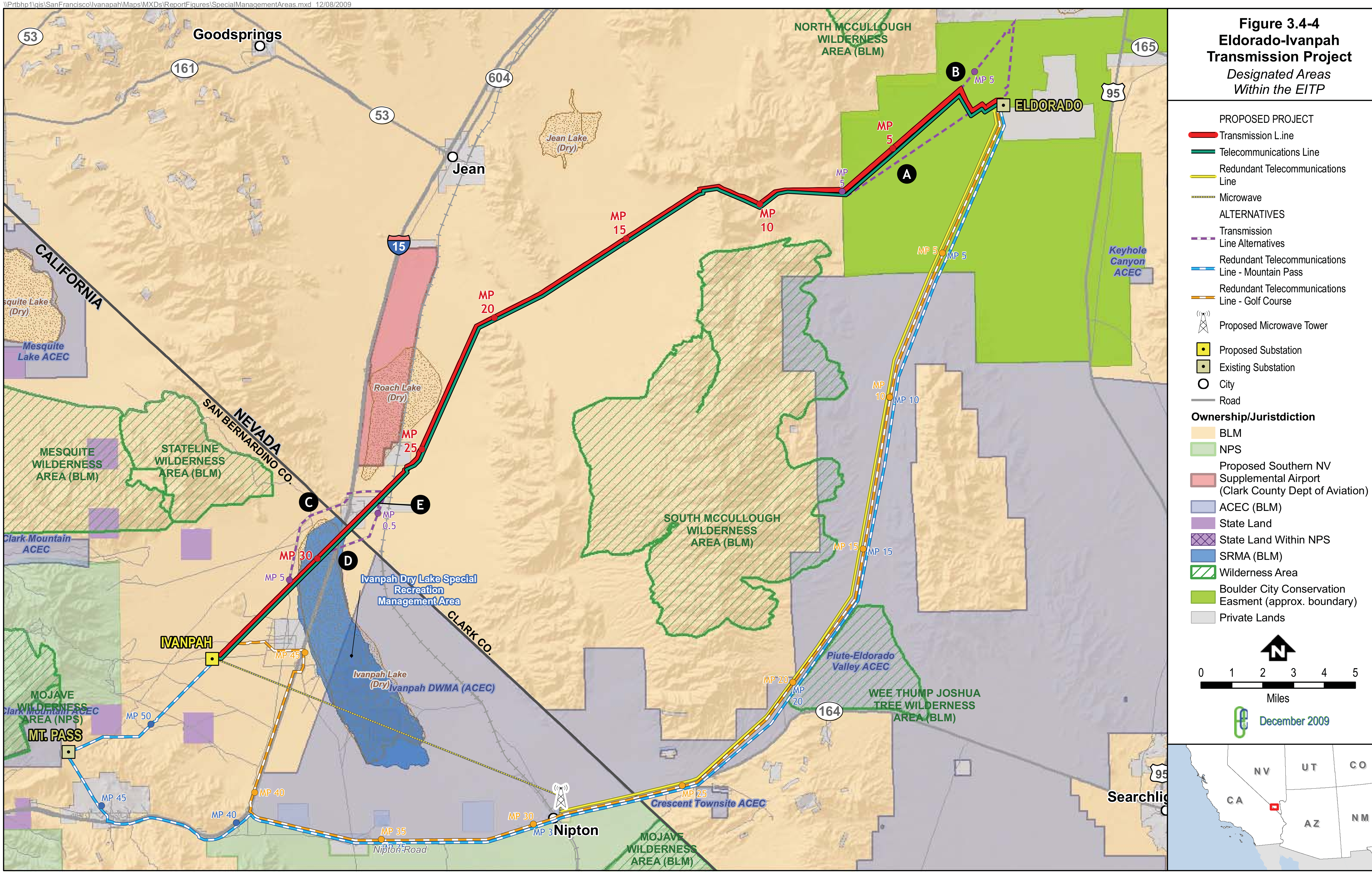

Important distinctions exist between regional and local corridors. Regional corridors link two or more large areas of natural open space and maintain demographic and genetic exchange between wildlife populations residing within these geographically distinct areas, whereas local corridors give resident animals access to essential resources (water, food, cover, or den sites) within a large habitat patch and may also function as secondary connections to the regional corridor system. Different species have different corridor use potentials. For example, a landscape feature that functions as a corridor for a songbird may not suffice for a mountain lion (*elis on olo*) or a reptile. A useful distinction can be drawn between natural and constructed corridor elements. Natural elements are features of the landscape, such as canyons or riparian strips, conducive to animal movement. Constructed elements, such as roadway bridges and drainage culverts, are often part of a corridor. Wildlife corridors in a partially developed landscape generally include both natural and constructed elements.

In the project vicinity, mountain ranges and valleys provide discrete corridors for wildlife movement. Barriers to movement include the highways and paved roads (such as I-15 and Highway 164), the Union Pacific railroad tracks running north–south through the project, and the dry lake beds (for some species). The surrounding mountain ranges, while providing corridors, may also present barriers. Animals that may use corridors are large mammals, reptiles, and bird species. As discussed above, desert bighorn sheep occur within the mountain ranges in this area, and may use the valleys to migrate between the mountains on a regional level, and use local corridors as access to guzzlers and lambing areas. Wild burros require habitat similar to that used by the bighorn sheep (Wehausen 2006), and ~~have~~ <u>sign has</u> been observed in the area; they may also use the area as a wildlife corridor. Suitable and critical habitat for the desert tortoise occurs throughout the project area and the area likely functions as an important regional linkage among individual populations. While the exact migratory patterns of Gila monster are not known, these reptiles likely have seasonal movement patterns (Nowak 2005), and may use local corridors within the area. Various locations within the project area may also provide habitat for migrating birds along the Pacific Flyway or local movements into preferred forage habitats. The Clark Mountain~~s~~ <u>Range</u> provide unique habitat for a variety of birds as previously discussed, and birds using the Clark range may also forage within the EITP.

3.4.2 Applicable Laws, Regulations, and Standards

The following section provides a summary of federal, state, and local laws, regulations, and standards that govern biological resources in the project area.

3.4.2.1 Federal

<u>Endangered Species Act, Section 7 (ESA, 16 USC §1531 et seq., and 50 CFR §17.1 et seq.)</u>

The ESA was passed by the U.S. Congress in 1973, and has since been amended several times. The ESA and 50 CFR 17.1 et seq. designate and provide for protection of threatened and endangered plants and animals and their critical habitat. Procedures for addressing federally listed species follow two principal pathways, both of which require consultation with the USFWS, which administers the ESA for all terrestrial species. The first pathway (ESA Section 10(a), Incidental Take Permit) is set up for situations in which a non-federal government entity (where no federal nexus exists) must resolve potential adverse impacts to species protected under the ESA. The second pathway (ESA Section 7, Consultation) involves projects with a federal connection or requirement; typically these are projects sponsored or permitted by a federal lead agency. For the EITP, the federal lead agency (the BLM) initiates and coordinates the steps below for Section 7:

- Informal consultation with USFWS to establish a list of target species
- Preparation of biological assessment assessing potential for the project to adversely affect listed species

- Coordination between state and federal biological resource agencies to assess impacts and proposed mitigation
- Development of appropriate mitigation for all significant impacts on federally listed species

The USFWS ultimately issues a final Biological Opinion on whether the project would affect federally listed species. The Biological Opinion includes ~~a~~ an Incidental Take statement of anticipated incidental take accompanied by the appropriate and reasonable mitigation measures to minimize such take. It is expected that the USFWS will issue a Biological Opinion for the EITP for impacts to any federally listed species.

Clean Water Act, Section 404 (33 USC §1344 and 40 CFR §100 et seq.)

The USACE has been authorized to regulate the discharge of dredged or fill material to the waters of the United States and adjacent wetlands by Section 404 of the Clean Water Act (CWA) of 1977. Wetland delineation is fundamental to USACE and U.S. Environmental Protection Agency regulatory responsibilities under Section 404 of the CWA. Wetland delineation consists of standardized procedures that are used to determine whether 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 define the area of federal responsibility under CWA, 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. 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 USACE Wetlands Delineation Manual for the Arid West Region was released by the USACE in December 2006, and is the current accepted standard for this region.

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 in the nation's navigable waters under the Rivers and Harbors Act of 1899. The USACE either performs or receives jurisdictional delineations of waters of the U.S. 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 on waters of the U.S. SCE will conduct and submit a jurisdictional determination to the USACE for the EITP to ascertain whether any U.S. waters are within the project boundary. If they are, a permit will be required for any impacts to those systems.

Clean Water Act, Section 401 (33USC §1341)

Applicants applying for USACE permit coverage under Section 404 of the CWA for actions that could result in any discharge into waters of the U.S. must obtain a water quality certification from the state in which the action is proposed.

The State of California uses its CWA Section 401 certification authority to ensure Section 404 permits protect state water quality standards. Water quality in California is governed by the Porter-Cologne Water Quality Control Act (California Water Code), which assigns overall responsibility for water rights and water quality protection to the State Water Resources Control Board (SWRCB). The nine statewide Regional Water Quality Control Boards (RWQCBs) develop and enforce water quality standards within their boundaries. The California Water Code defines "Waters of the State" as any surface water or groundwater, including saline waters, within the boundaries of the state. The Lahontan RWQCB has jurisdiction over the California portion of EITP.

The Nevada Department of Environmental Protection (NDEP) has the authority to grant or deny CWA Section 401 certification of a project requiring a federal permit for the discharge of dredge or fill materials under CWA Section 404. Alternately, the NDEP has the right to waive its certification authority if no action is taken on an application within a "reasonable time," not to exceed one year. If a waiver is granted, no conditions are attached, and in some cases a waiver may be equivalent to certification without conditions (NDEP 2009).

Migratory Bird Treaty Act (16 USC §7.3-712; 50 CFR §10)

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712) provides protection for a majority of bird species occurring in the U.S. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed under the MBTA. Some common species are not covered under the MBTA and include the European starling (*t n s lga is*), the house sparrow (*asse o esti s*), the rock pigeon (*ol ba li ia*), and game species such as grouse, turkey, and ptarmigan. There have been several amendments to the original law (including the Migratory Bird Treaty Reform Act of 1998). Currently, penalties include a fine of not more than $15,000 or imprisonment of not more than two years for misdemeanor violations of 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. Currently, 836 bird species are protected by the MBTA. The USFWS Migratory Birds and Habitat Program primarily operates under the auspices of the MBTA (USFWS ~~2009a~~ 2010a).

Bald and Golden Eagle Protection Act (16 USC §668 and 50 CFR §22 et seq.)

The Bald and Golden Eagle Protection Act (BGEPA) prohibits any form of possession or taking of either bald eagles (*aliaeet s le o ephal s*) or golden eagles. A 1962 amendment created a specific exemption for possession of an eagle or eagle parts (e.g., feathers) for religious purposes of Indian tribes. Rule changes made in 2009 (September 11, 2009, Eagle Rule (Rule) 50 CFR parts 13 and 22) finalized permit regulations to authorize limited take of these species associated with otherwise lawful activities. These new regulations establish permit provisions for intentional take of eagle nests under particular limited circumstances (USFWS ~~2009b~~ 2010b).

California Desert Protection Act of 1994

This act established 23 wilderness areas, including Death Valley and Joshua Tree national parks, the Mojave National Preserve, and the Granite Mountains National Reserve. It also declared certain lands in the California Desert as wilderness, and included other natural resource designations and provisions. Though the proposed project does not directly impact any lands regulated by this act, the project does border the Mojave National Preserve ~~and the Wee Thump Joshua Tree Wilderness Area~~.

California Desert Conservation Area Plan of 1980, as amended

The CDCA Plan was originally conceived under the Federal Land Policy and Management Act of 1976. It provides guidance for development of a plan for BLM management of public lands in the California desert (BLM 1980).

Northern and Eastern Mojave Coordinated Management Plan

The BLM approved the Northern and Eastern Mojave (NEMO) Management Plan in 2002, which is an amendment to the 1980 CDCA Plan (BLM 2002a). The NEMO plan sets standards for protection and preservation of approximately 2.4 million acres of public lands in the northern and eastern Mojave Desert in southeastern California. The plan established two DWMAs encompassing about 312,000 total acres that are managed as ACECs for the recovery of the desert tortoise (BLM 2002a, BLM 2002b). The project would cross through one of these areas, the Ivanpah DWMA, in California in areas north of Nipton Road (but south of I-15). The NEMO plan also addresses grazing guidelines for public leases and adjusted herd management areas for wild horses and burros as they affect the desert tortoise. The plan incorporated 23 wilderness areas (totaling 1.2 million acres) that were established by the 1994 California Desert Protection Act in the CDCA (BLM 2002b).

Desert Tortoise Recovery Plan and Critical Habitat Designation of 1994

The Desert Tortoise Recovery Plan established a strategy for the recovery and eventual de-listing of the Mojave population of desert tortoise. Six recovery units with 14 DWMAs were originally proposed in Arizona, California, Nevada, and Utah. Based on information in the Recovery Plan, 12 Critical Habitat Units were established for the Mojave population of desert tortoise by the USFWS on February 8, 1994 (59 FR 5820, USFWS 1994).

A draft revised recovery plan was prepared in 2008, which re-delineated the recovery units and reduced them from six units to five units, based on recent genetic research. The draft revised recovery plan combines the originally designated Eastern Colorado and Northern Colorado recovery units into the Colorado Desert Recovery Unit, which also now encompasses part of the Eastern Mojave Recovery Unit in Piute and Fenner valleys. The recovery units cover the entire range of the Mojave population of desert tortoise (USFWS 2008).

Cactus and Yucca Removal Guidelines, BLM

The BLM normally requires transplanting or salvage of certain native plant species that would be lost to development on lands under their jurisdiction. Species that typically require salvage regardless of their height in this region include yuccas (*a* spp.), ocotillo (*o ie ia splen ens*), and cacti. For chollas, the plant must be less than 3 feet in height to require salvaging; all plants greater than 3 feet in height must be left on site to be destroyed by clearing activities and used for vertical mulch on the site (BLM 2001). The larger chollas thus become part of a natural desert mulch, which provides a seedbank for regeneration of these species.

3.4.2.2 State of California

California Endangered Species Act (California Fish and Game Code §2050 et seq.)

The 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. 'Take' is defined under Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" a state-protected species. CESA does allow for incidental take associated with otherwise lawful development projects. The CDFG recommends consultation early in project planning stages to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project-induced losses of listed species. A project applicant is responsible for consulting with the CDFG~~, if applicable,~~ to preclude activities that are likely to ~~jeopardize the continued existence~~ result in a take of any CESA-listed threatened or endangered species ~~or destroy or adversely affect habitat essential for any given species~~. If take may occur, then an Incidental Take Permit (CDFG Code Section 2081) or Consistency Determination (i.e., with the USFWS Section 7 consultation) would be required.

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 (SAA) 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. An SAA would likely be required for impacts to drainages in the EITP in California.

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 gives 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 and possession of eggs or nest of any bird classified as a *al onifo es* or *t igifo es* (birds-of-prey), except as otherwise provided by this code or subsequent regulations. 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.

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. The act provides for 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 or by the federal government under ESA. 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.

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 CDFG Natural Community Conservation Planning 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).

3.4.2.3 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. The administering agency is the NDOW. Any authorizations for impacts to protected species would be processed through the NDOW.

Nevada Revised Statute 527.060–527.120

Nevada Revised Statute 527, supplemented by the NAC, protects and regulates the removal of Christmas trees, yuccas, and cacti for commercial purposes. Such removal or possession requires a permit and tags from the Nevada Spur Forester Fire Warden, Nevada Division of Forestry.

3.4.2.4 Regional and Local

San Bernardino County Development Code

Approval from the county is required to remove, harvest, or transplant a living desert native plant. Provision 89.0415 of the San Bernardino County Development Code prohibits harvest or removal of the following desert native plants except under a permit issued by the Agricultural Commissioner or other applicable County Reviewing Authority: (1) desert plants with stems 2 inches or greater in diameter or 6 feet or greater in height (e.g., smoketree [*alea spinosa*]), (2) all species of the genus *osopis* (mesquites), (3) all species of the family *ga a eae* (century plants, nolinas, yuccas), (4) creosote rings 10 feet or greater in diameter, and (5) all Joshua trees (Keep Milpas Rural 2009).

When the removal of specimen-size Joshua trees is requested, a removal permit will be granted only if the director of the Building and Safety Department finds that no other reasonable alternative exists for the development of the land. Joshua trees that are proposed to be removed would be transplanted or stockpiled for future transplanting wherever possible. In the instance of stockpiling, the permittee must comply with department policy to ensure Joshua trees are transplanted appropriately (Keep Milpas Rural 2009).

San Bernardino County General Plan

The San Bernardino County General Plan requires retention of existing native vegetation for new development projects, particularly Joshua trees, Mojave yuccas, creosote rings, and other species protected by the Development Code and other regulations. This can be accomplished by requiring the building official to make a finding that no other reasonable siting alternatives exist for development of the land prior to removal of a protected plant, by encouraging onsite relocation of Joshua trees and Mojave yuccas, and by requiring the developer to bear the cost of tree or yucca relocation (San Bernardino County 2007).

The San Bernardino County General Plan requires 50- to 100-foot riparian setbacks that prohibit removal of mature natural vegetation or of vegetation within 200 feet of a stream without a tree permit and environmental review with mitigations imposed. The San Bernardino County General Plan also encourages use of conservation practices when managing grading, replacing ground cover, protecting soils and natural drainage, and protecting or replacing trees (San Bernardino County 2007).

Clark County (Nevada) Multiple Species Habitat Conservation Plan

The Clark County MSHCP and the resultant USFWS Section 10(a) incidental take permit are designed to allow the incidental take of species covered by the ESA (Clark County 2000) on non-federal lands. The MSHCP provides for the long-term conservation and recovery of native species of wildlife and plants and their habitats, while allowing for regulated 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. The plan supplants earlier species-specific conservation efforts. Lists of species that are covered under the plan are provided. ~~Under the MCHSP, tree removal is allowed only for insect and disease control or in emergencies, and tree improvement activities may not impair wilderness values (Clark County 2000).~~

~~Four classes of management are designated under the MSHCP, and mitigation ratios and fees are applied to projects based on these classes.~~ For projects that impact non-federal lands that are protected under the MSHCP, a one-time mitigation and land disturbance fee of $550 per acre is required at the time a grading permit is issued. The collected fees are used to implement the mitigation strategy outlined within the MSHCP. Mitigation activities are undertaken on both federal and non-federal lands that are part of the MSHCP conservation reserve. Restoration projects such as removal of noxious weeds, native vegetation restoration, and placement of protective desert tortoise fencing are types of mitigation projects enacted through MSHCP funding. The MSHCP conservation reserve is comprised of lands that are categorized into four classes based on land management designations. Not all of the lands that are contained within the MSHCP conservation reserve are regulated or governed by the MSHCP, but rather are under the authority of the actual land owner. The following is a description of the four land management designations that are included within the MSHCP conservation reserve.

Intensively Managed Areas (IMAs) are "Core, High Priority Conservation Areas" set aside for one or more species, and no uses other than preservation are allowed. Less Intensively Managed Areas (LIMAs) are buffers between IMAs and other lands that preserve much of the natural resource values, while allowing low impact uses and development. Multiple Use Managed Areas (MUMAs) allow a variety of development (usually surrounding existing development and transportation and utility corridors), but mitigation is still required for species impacts. ~~Impacts to LIMAs generally require higher mitigation ratios than do impacts to MUMAs.~~ Unmanaged Areas (UMAs) are developed areas with little natural resource value and few requirements for natural resource preservation.

The non-federal lands around Primm, Nevada, and some of the land to the south and east of the existing Eldorado Substation are the only lands that would be directly governed by the Clark County MSHCP within the project boundaries ~~(Figure 3.4-4)~~. However, the BLM, as lead NEPA agency, is taking responsibility for EITP compliance with the ESA. Thus even though the project may cross private, non-federal lands, ESA compliance would be achieved through the USFWS Section 7 federal consultation process. Clark County does have Section 10 take authority for discretionary permits on private land through the MSHCP. Even though the applicant would not seek take authorization through the MSHCP, the underlying tenants of the HCP should be followed during project implementation.

~~Boulder City Conservation Easement~~

~~The Boulder City Conservation Easement (BCCE) was established by Boulder City in 1994 to exact protections and provide conservations for the desert tortoise, other species, and their habitat (City of Boulder 1994). The BCCE is a high priority conservation area in which development activity is severely limited. Only existing uses of historical easements are permitted, and expansion or significant modification to these uses is not allowed (Wainscott, personal communication 2009; Kokos, personal communication 2009). The BCCE was in place prior to the Clark County MSHCP, and the MSHCP has incorporated BCCE provisions. Clark County planners consider the BCCE to be the equivalent of USFWS-designated critical habitat (Wainscott 2009; Kokos 2009). The proposed project would fall within an existing utility easement corridor crossing the BCCE just east of the McCullough Pass area (Figure 3.4-4).~~

The Clark County Desert Conservation Program (DCP) promulgates the funding of many restoration projects in and around the EITP project area as part of the mitigation process for fees received by the Clark County MCHCP. After providing funds to parties participating in the MSHCP, the DCP does not direct these projects nor grant protections for them. These projects do not have legal instruments applied that protect the sites in perpetuity. Many of these restoration efforts are located within the boundaries of BLM's Piute-Eldorado Valley ACEC. The restoration mitigation projects fall under two categories: a) removing ecological threats or b) restoration/improvement of desert habitat quality. Specifically, restoration projects within the area aim to remove potential threats to special status species (and in particular, the desert tortoise). Potential actions to remediate threats include purchasing and closing sheep and cattle grazing allotments, road designations and closures, and other area closures (e.g., fencing off sensitive habitats to protect from damages from current OHV use and mining). Restoration and habitat improvement projects include monitoring for wild horses, burros, and desert tortoise, revegetation efforts, and invasive plant removal. These restoration projects are part of BLM's management and proactive conservation efforts within existing ACEC boundaries, and become part of the conservation portfolio for these areas. Currently, most of the grazing allotments (i.e., Jean Lake and McCullough Mountains grazing allotments) have been closed, and many access roads (Figure 5-5). The majority of habitat fencing was installed by the Nevada Department of Transportation and concentrated along Hwy 95 from Laughlin to the BCCE, and on the west side of I-15 from Primm to Rt. 53. The majority of the rest of the restoration projects are revegetation efforts (including special status plants) and invasive plant removal within specific locations (Figure 5-5).

Boulder City Conservation Easement

According to the "Interlocal Agreement for Sale and Grant of a Conservation Easement" between Boulder City and Clark County in 1995, the purpose of the BCCE is "to assure that the Property will be retained in a natural condition and to prevent any use of the Property that will impair or interfere with its National Resource Value." The terms of the easement are enforced by Clark County (the Grantee), which instituted "measures to preserve, protect, manage and study the Natural Resource Values of the Property, and in particular the habitat of the desert tortoise" (Boulder City and Clark County 1995) through the Clark County MSHCP. The "Amendment (Agreement No. 94-A313A) to the Conservation Easement Grant (Agreement No. 94-A313)," approved by the Boulder City on August 24, 2010, updates and clarifies the original agreement, establishes an Energy Zone (Exhibit C), and provides a list of "Best Practices to be used for the Construction, Maintenance, and Operation of Infrastructure to Pass Through and Within the Easement" (Exhibit D). The portion of the EITP that crosses outside of BLM-designated utility corridors would be required to pay a bond to Clark County, per the terms of Exhibit D of the 2010 Amendment. All other construction within the BCCE would be required to follow posted speed limits and other general requirements according to BCCE policies.

3.4.3 Impact Analysis

This section defines the methodology used to evaluate impacts on biological resources, including CEQA impact criteria. The definitions are followed by an analysis of each alternative, including a joint CEQA/NEPA analysis of impacts. At the conclusion of the discussion is a NEPA impact summary statement and CEQA impact determinations. For mitigation measures, refer to Section 3.4.4.

3.4.3.1 NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects to biological resources would result from the project, and explains the significance of those effects in the project area (40 CFR 1502.16). Significance is defined by CEQ regulations and requires consideration of the context and intensity of the change that would be introduced by the project (40 CFR 1508.27). Impacts are to be discussed in proportion to their significance (40 CFR 1502.2[b]). To facilitate comparison of alternatives, the significance of environmental changes is described in terms of the temporal scale, spatial extent, and intensity.

Effects to biological resources would occur if the project would:

- Substantially alter the structure and functions of sensitive upland, riparian, or aquatic vegetative communities;
- Change the diversity or substantially alter the numbers of a local population of any wildlife or plant species, or interfere with the survival, growth, or reproduction of affected wildlife and plant populations;
- Substantially interfere with the seasonal or daily movement or range of migratory birds and other wildlife;
- Result in a substantial long-term loss of existing special species habitat;
- Result in direct or indirect impacts on candidate or special-status species populations or habitat that would contribute to or result in the federal or state listing of the species (e.g., substantially reducing species numbers, or resulting in the permanent loss of habitat essential for the continued existence of a species); or
- Introduce and/or increase the potential for introduction of invasive, non-native, or noxious weeds to an area.

3.4.3.2 CEQA Impact Criteria

Under CEQA, the proposed project would have a significant impact if it would:

a. 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 CDFG or the USFWS;

   I. For desert tortoise, have any adverse effect on individuals of this species such that these animals become stressed and/or experience take;

   II. For raptors and birds protected by the MBTA, have any adverse effect on nesting birds such that birds abandon active nests and/or fledglings/young become stressed and/or experience take;

b. 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 CDFG or USFWS;

   I. Have a substantial adverse effect on sensitive desert vegetation and intact native vegetation communities;

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA;

d. Interfere substantially with the movement of native resident or migratory fish or wildlife species, wildlife corridors, or wildlife nursery sites;

   I. Interfere substantially with the movement of terrestrial wildlife species through physical entrapment or other means such that these animals become stressed and/or experience take;

e. Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

f. Conflict with the provisions of an approved local, regional, or state habitat conservation plan.

In addition to CEQA significance criteria, the NDOW has identified disturbance thresholds for certain species, restricting significant adverse impacts from project activities. These thresholds were considered in the assessment of impacts. Impacts would be significant if the construction, operation, or maintenance of the proposed project would not avoid adverse impacts to:

a. adult and juvenile desert bighorn sheep and sensitive habitat areas (i.e., lambing areas)

b. adult and juvenile burrowing owls and occupied habitat

c. Gila monster and occupied habitat;

d. nesting birds within the Wee Thump Joshua Tree Wilderness Area

3.4.3.3 Methodology

Impact analysis for biological resources was conducted by (1) gathering and vetting information from numerous sources (see description of sources below) in addition to the data provided by the applicant and (2) evaluating temporal and spatial affects to habitats and organisms potentially present within the project area and within a regional geographic context. Recent survey data provided by SCE were assessed for accuracy and appropriate implementation of resource agency protocols. Calculations for temporary and permanent disturbance to vegetation habitat were based on the applicant's projections of land disturbance from project features. Estimates for desert tortoise densities present within the EITP were provided from the 2008, 2009, and ~~2009~~ 2010 survey reports from SCE. Mapping resources were consulted to determine the extent of impact from the project on special management areas, including the Clark County MSHCP and the BCCE. Potential impacts and appropriate minimization and mitigation measures were discussed in-depth with resource agencies, specifically the USFWS, NDOW, and CDFG. Additionally, other relevant environmental documents for projects occurring in the same vicinity as the EITP were reviewed to assure consistency with impact analyses and proposed mitigation, including the ISEGS Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS) prepared by the California Energy Commission (CEC) and the BLM ~~and the joint CCPUC/BLM Draft Environmental Report (DEIR)/DEIS for the Sunrise Powerlink Transmission Project~~.

When analyzing impacts from the project alternatives, discussions were confined to impacts specifically generated by differences between the footprint of the proposed project and that of the alternative.

3.4.3.4 Applicant Proposed Measures

The applicant has included the following applicant proposed measures (APMs) related to biological resources:

APM BIO-1: Conduct Preconstruction Surveys. Preconstruction biological clearance surveys would be conducted by qualified biologists to identify special-status plants and wildlife.

APM BIO-2: Minimize Vegetation Impacts. Every effort would be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation would be flagged for avoidance.

APM BIO-3: Avoid Impacts on State and Federal Jurisdiction Wetlands. Construction crews would avoid impacting the streambeds and banks of streams along the route to the extent possible. ~~If necessary, an SAA would be secured from the CDFG.~~ As applicable, the necessary permits would be obtained from the appropriate agencies. Impacts would be mitigated based on the terms of the ~~SAA~~ permits. No streams with flowing waters capable of supporting special-status species would be expected to be impacted by the proposed project.

APM BIO-4: Best Management Practices. Crews would be directed to use Best Management Practices (BMPs) where applicable. These measures would be identified prior to construction and incorporated into the construction operations.

APM BIO-5: Biological Monitors. Biological monitors would be assigned to the project in areas of sensitive biological resources. The monitors would be responsible for ensuring that impacts on special-status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities would need to be restricted in order to protect native plants and wildlife or special-status species. Those restricted areas would be monitored to ensure their protection during construction.

APM BIO-6: Worker Environmental Awareness Program (see CR-2b, PALEO-3, W-11). A Worker Environmental Awareness Program (WEAP) would be prepared. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would 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 would be maintained.

APM BIO-7: Avoid Impacts on Active Bird Nests. SCE would 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 needed to be removed during the nesting season, or if work was scheduled to take place in close proximity to an active nest on an existing transmission or subtransmission tower or pole, SCE would coordinate with the USFWS, CDFG, and/or the NDOW as appropriate to obtain written verification prior to moving the nest.

APM BIO-8: Avian Protection. All transmission and subtransmission towers and poles would 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 (APLIC 2006).

APM BIO-9: Facility Siting. Final tower and spur road locations would be adjusted to avoid sensitive biological resources to the greatest extent feasible.

APM BIO-10: Invasive Plant Management. An invasive plant management plan would be developed to reduce the potential for spreading invasive plant species during construction activities.

APM BIO-11: Desert Tortoise Measures. The applicant or a qualified consultant would provide for the following to reduce impacts on desert tortoise:

- The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. Additionally, compliance discussions with Clark County and Boulder City must occur prior to construction that resolve and outline the specific compensation fees or additional mitigation measures needed for loss of desert tortoise habitat. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC.
- A field contact representative (FCR) would be designated and would oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The field contact representative would 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 would be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers would strictly limit activities and vehicles to the designated work areas.
- Crushing/removal of perennial vegetation in work areas would be avoided to the maximum extent practicable.
- All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens.
- Pets would not be allowed in working areas unless restrained in a kennel.
- Where possible, motor vehicles would be limited to maintained roads and designated routes.
- Vehicle speed within the project area, along ROW maintenance routes, and along existing access roads would not exceed 20 miles per hour. Speed limits would be clearly marked and all workers would be made aware of these limits.
- Constructed road berms would be less than 12 inches in height and have slopes of less than 30 degrees.
- Construction monitoring would 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) would be present during all activities in which encounters with tortoises could 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 USFWS. 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).
- Preconstruction clearance surveys would be conducted within 48 hours of initiation of site-specific project activities, following USFWS protocol (USFWS 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 would cover 100 percent of the acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity would be

marked. Tortoise burrows would be avoided to the extent practicable, but would be excavated if they would be crushed by construction activities.

- Any tortoise found on the surface would be relocated to less than 1,000 feet away. Tortoises would be handled carefully following the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises would be handled with new latex gloves each time to avoid transmission of disease, and handlers would especially note guidelines for precautions to be taken during high-temperature periods.
- If a potential tortoise burrow were required to be excavated, the biologist would proceed according to the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises removed from burrows would be relocated to an artificial burrow (Desert Tortoise Council 1999). The entrance of the artificial burrow would be blocked until construction activities in the area were 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 might occur would be monitored by a qualified or authorized biologist. The biologist would be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The qualified or authorized biologist would 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 were minimized.
- No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) would be left unfenced or uncovered; such hazards would be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term project areas would be enclosed with tortoise-proof fencing. Fencing would be removed when restoration of the site was completed.
- Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan would be documented immediately by the biological monitor. The field contact representative would ensure that appropriate corrective action was taken. Corrective actions would be documented by the monitor. The following incidents would 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 was required. If the monitor and field contact representative did not agree, the federal agency's compliance officer would be contacted for resolution. All parties could refer the resolution to the federal agency's authorized officer.
- Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed.
- All construction personnel, including subcontractors, would complete a WEAP. This instruction would 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 would be inspected prior to being moved. If a tortoise were found beneath a vehicle, the authorized biologist would be contacted to move the animal from harm's way, or the vehicle would not be moved until the desert tortoise left of its own accord. The authorized biologist would be responsible for taking

appropriate measures to ensure that any desert tortoise moved in this manner was not exposed to temperature extremes that could be harmful to the animal.

- Should any desert tortoise be injured or killed, all activities would be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist would be responsible for reporting the incident to the authorizing agencies.
- A report to the USFWS would be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises would be reported.
- The applicant would implement a Raven Management Program that would consist of: (1) an annual survey to identify raven nests on towers and any tortoise remains at ~~the base of the towers;~~ tower locations; this information would be relayed to the BLM so that the ravens and/or their nests in these towers could be targeted for removal, (2) SCE making 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.

APM BIO-12: Desert Bighorn Sheep Measures. The applicant would consult with the BLM, USFWS, and NDOW regarding conservation measures to avoid impacts on desert bighorn sheep during construction. Project areas with the potential to impact bighorn sheep include the proposed transmission line route through the McCullough ~~Mountains~~ Range and the telecommunication route segment in the southern Eldorado Valley between the Highland Range and the Southern McCullough ~~Mountains~~ Range. Avoidance and minimization measures could include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn sheep active seasons. Construction requiring the use of helicopters would 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~~ Range (June through September).[3]

APM BIO-13: Western Burrowing Owl Measures. Where project ground-disturbing activities would 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, would be thoroughly inspected by a qualified biologist before being collapsed. This would discourage owls from breeding on the construction site. Other species using burrows would be relocated prior to collapsing burrows. If construction were to be initiated after the commencement of the breeding season and burrowing owls could be seen within areas to be affected by ground construction activities, a qualified biologist would observe behavior to determine their breeding status. If breeding were observed, the nest area would be avoided, with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the chicks fledged.

APM BIO-14: Gila Monster and Chuckwalla Measures. The following measures are the current NDOW construction site protocols for the Gila monster (NDOW 2005).[4] These protocols are applicable for the Gila monster in both the Nevada and California sections of the project, and applicable for the chuckwalla in the Nevada section of the project.

Through the WEAP, workers and other project personnel should (at a minimum) know how to (1) identify Gila monsters and distinguish them from other lizards such as chuckwallas and banded geckos, (2) report any observations of Gila monsters (in Nevada) to the 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 harm's way on the construction site would be captured and then detained in a cool, shaded environment (<85 degrees Fahrenheit) by the project biologist or equivalent personnel until an NDOW biologist could arrive for documentation purposes. Although 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

[3] The date of bighorn lambing season has been amended per MM BIO-13 to be January to May.
[4] The date of the most current NDOW Gila monster protocols has been amended per MM BIO-17 to be 2007.

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) would also be provided to NDOW.

- Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. If 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 would not be covered by NDOW. However, NDOW would be immediately notified during normal business hours. If an animal were killed or found dead, the carcass would 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, biologists 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) would 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) would be provided to NDOW. Pictures would 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).

3.4.3.5 Proposed Project / Proposed Action

The EITP would be constructed within an existing SCE transmission line ROW which contains areas of pre-existing ground disturbance. However, the existing SCE 70- to 100-foot ROW would need to be widened to a minimum of 100 feet and where possible to a 130-foot ROW for the entire route to accommodate the 230-kV transmission line. At major utility transmission line crossings, a 250-foot ROW would be required at the crossing locations for side-by-side structures. New spurs roads would be required for the new towers since the existing towers have no spur roads (they were built in 1930 to 1931). The proposed project would result in impacts to both vegetation and wildlife communities, as well as to special-status plant and wildlife species. The analysis is presented below, followed by NEPA and CEQA conclusions and a summary of all recommended mitigation measures.

Vegetation

Clearing and grading or other ground disturbing activities for project infrastructure (the substation, improvements to existing access/spur roads, new access/spur roads, staging areas, pulling areas, stringing and splicing areas, and tower foundations for the transmission and telecommunications lines) would cause the direct loss of vegetation communities within the project area boundaries. Vegetation communities affected would include creosote brush-white bursage desert scrub, saltbush scrub, Mojave yucca desert scrub, Joshua tree woodland, black bush scrub, desert wash~~, and pinion pine-juniper~~. Some disturbance would be temporary, such as for the installation of temporary spur roads, staging areas, and pulling and stringing areas, which would all be removed upon construction completion. Impacts to vegetation in these areas would be temporary, as communities would likely re-colonize these areas over time. Other project infrastructure would be permanent, and vegetation would be permanently impacted for those project areas (substation, access roads, and towers). The extent of disturbance impact would vary by vegetation community and location within the project area. Total temporary disturbance would be approximately ~~384 acres~~ 318 acres, while permanent disturbance would be approximately ~~59 acres~~ 55 acres. Table 3.4-2 contains a breakdown of the acreage of permanent and temporary impacts per vegetation community. Creosote-white bursage scrub and black bush scrub are the dominant vegetation types within the project area and thus these communities would have the highest acreage impact.

Clearing and grading activities could cause the direct loss of *s oba ia spp*., small-flowered androstephium, California barrel cactus, rosy two-toned beardtongue, and white-margined beardtongue along the proposed transmission line in Nevada, and the direct loss of Utah vine milkweed, Parish club cholla, nine-awned pappus grass, Mojave milkweed, Aven Nelson's phacelia, sky-blue phacelia, California barrel cactus, and black gamma along the proposed transmission line in California. Clearing and grading required for one of the proposed pulling stations for the 115-kV line located to the west of the proposed substation could cause the loss of Parish club cholla and nine-awed pappus grass. Clearing and grading required for the telecommunication line ~~(Path 1)~~ could impact individuals of several special-status plant species: the Utah vine milkweed, *s oba ia* spp., desert pincushion and sky-blue phacelia~~, all identified in the EITP in California~~ along the California portion, and desert pincushion and California barrel cactus along the Nevada portion of the telecommunications line. Clearing and grading for the Ivanpah Substation could cause the loss of Parish club cholla, barrel cactus, and *s oba ia* spp. There could be both temporary and permanent impacts, depending on whether plant individuals ~~could~~ would re-colonize on their own (a species-specific factor) and whether the impact is a permanent disturbance, which would also depend on whether the existing seedbank was still present after clearing.

Grading activities would disturb soil along the proposed transmission line and telecommunication line, thus indirectly impacting the vegetation communities by creating opportunities for non-native invasive weed species to colonize the disturbed work areas. Invasive weed species could out-compete native plants for resources such as water and space. Additionally, soil disturbance could reduce the native seed bank associated with the site. Dust generated during construction could adversely affect onsite and offsite native vegetation communities by reducing photosynthetic and respiratory activity, which could lead to lower growth rates and/or lower fitness of native plant species. Removal of native plant species would leave denuded areas at risk for the potential spread of non-native invasive weed species. Non-native invasive weeds could also be spread during operation and maintenance activities, such as from additional vehicle traffic due to routine line patrols, line washing, and ROW road maintenance. Additional vehicles and crews could indirectly impact the native vegetation by inadvertently track in clinging seeds and/or parts of noxious weeds, thus facilitating their spread. The spread of noxious weeds could also impact the current fire regime, as an increase in noxious weeds could increase the biofuel present, resulting in an increase in the intensity and/or frequency of fires. The increase in fire intensity and/or frequency could indirectly impact the native vegetation community by creating conditions in which plant species that are fire tolerant would have a competitive advantage. In general, noxious weeds tend to be more adaptive to frequent fires than the native desert vegetation. Spread of noxious weeds also could impact special management areas adjacent to or crossed by the project, such as the BCCE, MSHCP-funded restoration projects, the Mojave National Preserve, Wee Thump Joshua Tree Wilderness Area, Clark Mountain ACEC, Eldorado-Puite ACEC, and Ivanpah DWMA ACEC. Some invasive/noxious species (e.g., *o i* spp , *o* s spp., and *his* s spp.) are already widespread in the area and thus project implementation would have little effect on further impacts from these species. The proliferation of other weeds such as saltcedar and thistles could adversely impact native vegetation in the project area because these species would require aggressive control strategies.

The applicant has incorporated the following measures to minimize impacts to vegetation and special-status plants, and to reduce the spread of noxious, non-native, and invasive species:

- Preconstruction surveys (APM BIO-1)
- Minimal vegetation impacts (APM BIO-2)
- Best management practices (APM BIO-4)
- Biological monitors (APM BIO-5)
- Worker and environmental awareness program (APM BIO-6)

- Facility siting (APM BIO-9)
- Invasive plant management (APM BIO-10)
- Seeding and inter-planting (APM AES-2; see Section 3.2, “Aesthetics and Visual Resources,” for details on this and the next three measures)
- Regrading/revegetation of construction sites (APM AES-4)
- Minimizing of road modifications (APM AES-6)
- Suppression of dust (APM AES-7)

Implementation of the project as designed, including these APMs, would result in adverse, moderate impacts on native vegetation communities and individuals of special-status plants species. There would be both short- and long-term impacts (depending on whether the ground disturbance was permanent or temporary) localized to the proposed route and substation footprint. Impacts also could be extensive due to the potential spread of introduced noxious and invasive plant species outside the boundaries of the proposed project along disturbance corridors. To avoid and minimize the impacts, mitigation measures are recommended. Details of recommended mitigation measures (MM) are found in Section 3.4.4. Preconstruction surveys proposed by the applicant need to include specific measures related to vegetation. All areas where clearing and grading and general ground-disturbance would occur need to be surveyed. MM BIO-1 includes surveying brush clearing areas during preconstruction surveys to check for the presence of special-status plants to be avoided and to determine the presence of noxious weeds that would need control strategies. MM BIO-2 involves restoration of vegetation and soils within the proposed project area to preconstruction conditions, immediately following the completion of all construction-related activities at impact sites and within one year post-construction, according to the requirements of wildlife resource agencies’ authorizations. This measure (along with MM LU-1) also requires direct coordination with appropriate federal, state and county resource agencies for review and approval of a restoration plan. MM BIO-3 provides mitigation and compensation for special-status plants; these measures include transplanting and re-seeding and/or compensation, and would be carried out in consultation with appropriate agencies (USFWS, BLM, CDFG, and NDOW). Restoration to original conditions using native plants and soils is needed to encourage native revegetation from the associated seedbanks. MMs BIO-2 and BIO-3 provide protection to vegetation greater than that provided by APMs AES-2 and AES-4 by providing the specific details necessary to successfully implement onsite restoration activities. MM BIO-4 recommends that the Invasive Plant Management Plan produced in APM BIO-10 comply with BLM standards to be effective. See Section 3.4.4, “Mitigation Measures,” for further details on the mitigation measures proposed.

Jurisdictional Waters, Drainages, and Riparian Areas[5]

~~Based on a preliminary review of the location of intermittent streams as identified by USGS topographical maps, the proposed transmission line would impact several intermittent streams and desert washes.~~

Based on the combination of jurisdictional field surveys, review of NRCS digital hydrologic unit boundary layer data set, recent Jurisdictional Determinations issued by USACE for nearby projects, consultation with USACE staff, and review of high resolution aerial imagery, the proposed transmission line would impact numerous intermittent streams and ephemeral desert washes. Overall, the construction of the project would result in approximately 13.9 acres of temporary and 0.07 acres of permanent impacts to potential waters falling under the jurisdiction of USACE. A few ephemeral washes that drain the Jean Lake and Eldorado Valley Dry Lake watersheds in the northeastern portion of the project were determined to be isolated intrastate playa lakes with no significant nexus to interstate or foreign commerce, and thus not jurisdictional under the USACE. Along the California portion of the proposed project, construction of the project would potentially result in up to a total of approximately 15.5 acres of temporary impacts and up to approximately 0.333 acres of permanent impacts to playa and desert wash riparian habitats that are presumed to fall under the jurisdiction of CDFG.

[5] ~~NOTE: Pending a jurisdictional delineation, analysis on this section is incomplete.~~

Clearing of vegetation for grading activities (for the substation, existing access/spur roads, new access/spur roads, staging areas, pulling areas, stringing and splicing areas, and tower foundations for the transmission and telecommunications lines) and trenching activities to install the communication line could result in removal of desert wash vegetation and/or filling of jurisdictional areas. Additionally, removal of vegetation could result in increased erosion and sedimentation, resulting in degradation of water quality. The use of access and spur roads that cross desert washes during construction and during routine operation and maintenance could result in riparian vegetation loss and increased erosion. Grading activities would disturb soil associated with the desert washes, thus indirectly impacting the desert wash vegetation by creating opportunities for non-native invasive weed species (e.g., *Ta a i a osissi a*) to colonize the disturbed work areas. Invasive weed species could out-compete native plants for resources such as water and space. Dust generated during construction could reduce the photosynthetic and respiratory activity of desert wash vegetation, which could adversely affect the growth rate and/or fitness of the vegetation. The use of vehicles and equipment to cross these washes could also result in degradation of water quality from the potential introduction of hazardous materials such as fuels and oils.

~~A complete assessment of potential effects to jurisdictional waters, riparian areas, and wetlands caused directly or indirectly by the proposed project cannot be completed until Jurisdictional Delineation surveys are conducted.~~

The following measures would reduce impacts to potential jurisdictional waters:

- Minimal vegetation impacts (APM BIO-2)
- Avoidance of impacts to state and federal jurisdictional wetlands (APM BIO-3)
- Best management practices (APM BIO-4)
- Facility siting (APM BIO-9)
- Hazardous materials and waste handling management (APM HAZ-2)
- Spill prevention, countermeasures, and control plan (APM HAZ-5)
- Avoidance of drainages crossings by construction equipment (APM W-1)
- Erosion control (APMs W-2, W-4, W-9)

If the pending USACE Jurisdictional Determination ~~identifies~~ confirms the ~~presence of~~ jurisdictional status of the waters~~,~~ and riparian areas~~, or wetlands~~ within the proposed project area and these cannot be avoided (APM BIO-3), the adverse impacts will likely be moderate and both short term and long term. MMs BIO-5, BIO-6, and BIO-7 are recommended to reduce the adverse impacts on drainages and jurisdictional areas to minor on a localized scale. MM BIO-5 would require completion of a jurisdictional determination within the boundaries of the project area once the final engineering for the location project-specific features is complete. MM BIO-6 designates practices to minimize the amount of erosion and degradation to existing drainages. MM BIO-7 would require the applicant to develop a Mitigation Monitoring Plan for affected jurisdictional areas, as needed, for submittal to USACE for review and approval.

Wildlife

Clearing and grading or other ground-disturbing activities for project infrastructure (the Ivanpah substation, existing access/spur roads, and new access/spur roads, staging areas, pulling areas, stringing and splicing areas, and tower foundations for the transmission and telecommunications lines) would be potential sources of direct death of wildlife. Collisions with equipment and vehicles could occur for slower-moving species, species that have subsurface burrows, or ground-nesting birds. Nesting birds, bats, and reptiles are very susceptible to visual and noise disturbances caused by the presence of humans, construction equipment, and generated dust. Such disturbances could cause wildlife to alter foraging and breeding behavior and to avoid suitable habitat inside and outside the boundaries of the proposed project. For instance, nesting birds could abandon nests due to these disturbances, and if night construction were to be conducted, bats would be highly susceptible to night lighting. Many species of wildlife can be impacted by night lighting activities, particularly nocturnal bird, reptile, and bat species. Night lighting can alter foraging, migration, and breeding behaviors of these species. Night lighting can also induce disorientation in animals, thus increasing risk of collision with objects and potential susceptibility to predation.

Wildlife would also be indirectly impacted. As discussed earlier, grading and construction activities would remove and/or modify natural vegetation communities. These vegetation communities provide forage, shelter, and nesting opportunities to non-listed wildlife and multiple special-status wildlife. Loss and degradation of habitat would cause wildlife to rely more heavily on habitat in surrounding areas. The loss and degradation of habitat would have the potential to impact wildlife within the adjacent special management areas, which are the BCCE, Mojave National Preserve, Wee Thump Joshua Tree Wilderness Area, Eldorado-Puite ACEC, Ivanpah DWMA ACEC, and Clark Mountain ACEC (adjacent to the Mountain Pass Substation). Loss of burrows due to proposed project construction, ground vibration, or avoidance behavior would cause wildlife to search for and/or dig new burrows. The searching and/or digging would expend more energy, which could result in an increased susceptibility to disease and predation and lowered reproductive success. Substation infrastructure built could alter wildlife movement, as animals ~~would~~ might avoid construction areas such as those for the microwave tower and other permanent structures. Wildlife movement could also be altered due to construction of the perimeter fence that would exclude most wildlife from the 885-by-850-foot fenced area. The presence of proposed project infrastructure could also indirectly cause death of wildlife by increasing the risk of predation on certain species by native predators such as ravens and raptors due to additional perching and/or nesting habitat created by construction of the microwave tower, perimeter fence, and new transmission towers.

The following measures would help avoid or reduce impacts on wildlife species:

- Preconstruction surveys (APM BIO-1)
- Best management practices (APM BIO-4)
- Biological monitors (APM BIO-5)
- Worker and environmental awareness program (APM BIO-6)
- Facility siting (APM BIO-9)
- Invasive Plant Management (APM BIO-10)
- Minimization of road modifications (APM AES-6)
- Substation lighting control (APM AES-8)
- Muffling of construction equipment (APM NOI-4)
- Minimization of construction equipment idling (APM NOI-5)
- Removal of construction waste and trash (APM W-12)

Adverse, moderate impacts on wildlife species would occur with implementation of the proposed project and the proposed APMs. These impacts would be both short- term and long term and would be localized to the proposed route and substation footprint. To further avoid and reduce impacts, mitigation measures are recommended. MM BIO-1 includes surveying brush clearing areas during preconstruction surveys to allow clearance of the vegetation while preventing causing the inadvertent death of sheltering wildlife. MM BIO-8 reduces night lighting on sensitive habitats in all areas to avoid unnecessary ~~visual~~ disturbance to wildlife. MM BIO-9 ~~prevents~~ minimizes entrapment of wildlife in all steep-walled trenches or excavations. MM BIO-10 includes use of biological monitors throughout construction activities in all construction zones to ensure that wildlife is not harmed or harassed during construction.

Construction activities for project infrastructure are all sources of potential adverse impacts to listed or sensitive wildlife species. The mechanisms of potential impact as described above for non-listed species apply as well for special-status species and include direct and indirect impacts. Potential impacts and avoidance and minimization measures for grouped sensitive species are discussed in detail below.

Reptiles

Fifteen special-status reptile species may occur within the proposed project area. Two of these species were observed, the chuckwalla and the desert tortoise. An additional seven species (side-blotched lizard (*ta stansb iana*), desert iguana (*ipsosa s o salis*), long-nosed leopard lizard (*a belia isli enii*), western whiptail (*ne i opho s tig is*), zebra-tailed lizard (*allisa s a onoi es*), common collared lizard (*otaphyt s olla is*), and sidewinder (*otal s e astes*) were observed on the ISEGS site during biological surveys for that site (~~CEC 2008~~ BLM 2010). The special-status reptiles potentially present within the project area would all be subject to similar types of impacts. Ground-disturbing activities could result in injury and death to slower-moving reptiles or reptiles occupying subsurface burrows. Increased vehicle use on the site during operation and maintenance could also increase the potential for collisions and death. The project would result in loss of habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. Permanent habitat loss would be small (less than approximately 51 acres) relative to available habitat within the area. Compaction of soils and introduction of exotic plant species due to grading and removal of vegetation during construction, operation, and maintenance activities could result in indirect adverse habitat loss over time.

Desert Tortoise

Construction of the project would cause adverse impacts on desert tortoise and its habitat. These impacts would be both short term and long term, and both localized and extensive. Proposed project ramifications would primarily be confined to project areas, although there is a small potential for impacts to extend to areas outside the project boundary. Desert tortoises maintain large home ranges of from approximately 10 acres up to 200 acres, depending on sex of the individual and on precipitation levels (USFWS 1994, 2008). Individual desert tortoises have been documented to make periodic forays of up to 7 miles at a time (USFWS 2008). Tortoises that maintain burrows in areas adjacent to the project could be impacted if they were to travel into the project area. In general, construction of the project, including clearing and grading and areas where drive-and-crush of vegetation would occur, would result in short-term impacts. Long-term impacts to desert tortoise would occur from permanent loss of habitat (e.g., within the footprint of permanent structures) and increased traffic along the entire ROW. Construction and operations/ maintenance crews might drive vehicles over vegetation within project areas. This would be particularly likely during tower-to-tower stringing activities, unless all cables were installed by helicopter. Impacts caused by disturbance to small areas, such as tower pad sites, would be localized. Although many such areas would be impacted, they would be spaced far enough apart that the impact would not be extensive. Impacts from disturbance to larger areas, such as access roads, spur roads, and the proposed Ivanpah Substation, would be extensive.

Desert tortoises would be susceptible to death or injury from collisions with project vehicles and equipment during clearing and grading, or any activities where vegetation would be crushed. Project-related traffic on access roads and spur roads as well as any construction activities at work sites could also result in the death or injury of desert tortoise through collisions. Desert tortoises could be harmed by inadvertent hazardous materials spills, including equipment fuel and hydraulic fluid leaks. All crew activities, as well as trash and debris associated with construction of the project, would have the potential to attract predators of the desert tortoise, including common ravens and domestic and feral dogs. In addition, both permanent and temporary structures, including fencing, towers, and buildings, would provide common ravens with perches. Handling desert tortoises for relocation, even by approved biologists, could lead the tortoises to void their bladders. Bladder voiding would cause tortoises to lose potentially critical water reserves and in some cases might lead to death. Handling desert tortoises also increases the risk of transmitting upper respiratory tract disease (URTD) from infected individuals to healthy individuals. This condition often leads to death and is one of the reasons for the decline of many desert tortoise populations in the Mojave Desert. Construction of any new access or spur roads could increase the volume of human recreational traffic, which could indirectly increase the potential for collection or for death by vehicle strike.

Desert tortoise habitat would be lost in project areas where permanent structures, access roads, or spur roads would be located. With a total area of approximately 38.5 acres, the proposed Ivanpah Substation in California would result in the largest project-related loss of desert tortoise habitat in a single area. In all areas of the project where vegetation and soil would be disturbed, but especially in areas that would be cleared or graded, the quality of desert tortoise habitat would be negatively affected. Introduced noxious and invasive plant species could out-compete existing annual vegetation that desert tortoises largely rely on for forage. There is a greater risk for loss of desert tortoise habitat due to increased scope and intensity of wildfires as invasive grasses become established in areas (USFWS 2008). Direct removal of succulent plant species would likewise remove available forage and an important source of moisture. The loss of mature shrub vegetation in cleared and graded areas would reduce the available shelter used by desert tortoises for shade and predator evasion. The proposed transmission alignment would result in a total of 258 acres (230 acres of temporary disturbance and 28 acres of permanent disturbance) of new disturbance to suitable, non-critical habitat for desert tortoise (SCE 2010). The proposed redundant communication line, including all of the segments located in Nevada and California, would result in 12 acres of new disturbance to desert tortoise critical habitat, with all 12 acres being temporary disturbance to suitable desert tortoise habitat.

Vehicles and equipment used during operations and maintenance of the project would make desert tortoises susceptible to death or injury from collision. Such activities, including line inspection and regular maintenance, would also potentially introduce noxious and invasive plant species to project sites, further degrading the quality of desert tortoise habitat in terms of native plant species composition and increasing the risk of wildfires.

Most of the project segments are located within desert tortoise habitat, and a significant proportion of these segments cross designated critical habitat (Figure 3.4-2, Table ~~3.4-6~~ 3.4-8). Desert tortoise sign such as burrows, scat, and bone or shell fragments were observed in almost all areas of the proposed transmission alignment during surveys conducted in 2008, 2009, and 2010 including on the proposed Ivanpah Substation site in California. Live desert tortoises were observed only on the transmission alignment in Nevada and along the existing Jean access road. Although no live desert ~~tortoises~~ tortoise were observed on or near the California segments of the project (excluding the proposed Ivanpah Substation), the nature and amount of desert tortoise sign observed in these areas indicates that tortoises are present here as well. The redundant telecommunications line is almost entirely within desert tortoise habitat~~. While surveys of this area have not currently been reported (pending the 2009 desert tortoise survey report), available literature suggests that desert tortoise is present along this segment of the project.~~ and observations of desert tortoise sign during the surveys indicate that tortoise are present along the lower elevation portions of the route. Desert tortoise densities calculated for the proposed transmission route were found to be approximately 5.2 tortoises per square mile. Desert tortoise density for the proposed BrightSource Solar Energy Project (located just north of the proposed Ivanpah Substation) was estimated to be 2.25 tortoises per square mile. Density estimates for the proposed transmission route are lower than the 2007 density estimates for the adjacent Ivanpah Valley and adjacent Piute-Eldorado Valley monitoring strata (USFWS 2007).

Several areas within the proposed project area are not suitable habitat for desert tortoise, including Roach and Ivanpah lakes (dry), the disturbed and developed areas in and around the town of Primm, Nevada, and likely the higher elevations of the Eldorado–Lugo transmission line in the southern McCullough Range where no desert tortoise sign was observed during the 2009 and 2010 surveys.

The project would cross two areas the USFWS designates as critical habitat for the desert tortoise (Figure 3.4-2), both of which are in the Northeastern Mojave Recovery Unit for the Mojave population of the desert tortoise (USFWS 2008). Impacts such as those caused by ~~grading and~~ clearing and grading in critical habitat would be considered permanent in terms of restoration requirements, mitigation, and compensation. The proposed transmission alignment would cross approximately 8.3 miles of the Piute-Eldorado Critical Habitat Unit in Nevada to the west of the Eldorado Substation. Additionally, 2.1 acres of desert tortoise habitat within the Piute-Eldorado Critical Habitat Unit would be impacted by establishment of four proposed tensioning sites, four proposed pulling sites, and one proposed helicopter landing pad. The proposed transmission alignment would result in a total of 80 acres (67 acres of temporary disturbance and 13 acres of permanent disturbance) of new disturbance to desert tortoise critical habitat (SCE 2010). ~~These~~ Though the majority of the disturbance would be temporary in nature, ~~but~~ it would be considered permanent as they would be new disturbance areas in the Critical Habitat Unit. Impacts on the unit would be adverse, localized, and both short term and long term, depending on the location and type of construction activity considered.

The proposed redundant telecommunications line along the existing Eldorado–Lugo transmission line, to the south of the Eldorado Substation, would cross approximately 11.8 miles of the Piute-Eldorado Critical Habitat Unit in Nevada~~, to the south of the Eldorado Substation~~. Impacts on this area of the Critical Habitat Unit would be adverse, but due to the lower intensity of construction activities planned along this segment (fiber optic line installation~~ and~~, tower retrofitting, and pulling and splicing sites), the impacts would be primarily short term and localized. ~~Impacts on critical habitat along this segment of the project would be long term and extensive if a significant length of new access or spur roads were to be constructed to access the existing Eldorado–Lugo transmission line, or if existing tower sites would need to be significantly graded~~. The proposed redundant telecommunications line would be installed underground along Nipton road from the California-Nevada state line to the proposed microwave station north of the town of Nipton and would cross the Ivanpah Critical Habitat Unit in California. This segment of telecommunications line would largely be installed in a narrow trench in the disturbed shoulder of Nipton Road. Impacts on critical habitat for this segment of the project would be adverse, short term, and localized. Construction of the underground proposed telecommunications line from Nipton Road north to the proposed microwave tower site, as well as the microwave tower site itself (approximately 0.23 acres), would be constructed primarily on previously undisturbed lands. Impacts on the Critical Habitat Unit along these segments of the project would be adverse, and both short term and long term, and, due to the small footprint of the microwave tower site and the narrow width of the trench, localized. The proposed redundant communication line, including all of the segments located in Nevada and California, would result in 16 acres of new disturbance to desert tortoise critical habitat, with 15 acres of temporary disturbance and 0.2 acres of permanent disturbance (SCE 2010). Though the majority of the disturbance would be temporary in nature, it would be considered permanent as they would be new disturbance areas in the Critical Habitat Units.

The proposed project would cross two DWMAs that are managed by the BLM as ACECs specifically for desert tortoise. Within the scope of the project area, these ACECs do not completely overlap the critical habitat units discussed above. Only the redundant telecommunications line would cross these ACECs. This line would cross the Piute-Eldorado Valley ACEC in Nevada and the Ivanpah ACEC in California. Impacts on these ACECs would be adverse, localized, and both short term and long term. ~~Impacts on the Piute-Eldorado ACEC along this segment of the project would be long term and extensive if a significant length of new access or spur roads were constructed to access the existing Eldorado–Lugo transmission line.~~

The proposed redundant telecommunications line would be adjacent to the Mojave National Preserve in California. The project is separated from the preserve by Nipton Road on the southern edge of the project area. Nipton Road is a two-lane highway that receives light traffic. The construction planned along this segment of the project would involve installing fiber optic cable in a newly excavated narrow trench in the shoulder of Nipton Road. It is possible, but not likely, that desert tortoises residing in the preserve would cross Nipton Road and ~~become susceptible to death~~ be subject to mortality from collisions with project vehicles and equipment. ~~In~~Therefore, in general, potential impacts on the desert tortoise population of the Mojave National Preserve ~~would be adverse, short term, and localized. No impacts on the desert tortoise populations in the Mojave National Preserve~~ are not anticipated.

The applicant has incorporated measures into the project design in addition to those prescribed for general wildlife that would avoid or minimize impacts on desert tortoise. Those additional APMs are:

- Minimal vegetation impacts (APM BIO-2)
- Desert tortoise measures (APM BIO-11)

Implementation of the proposed project, including the listed APMs, would result in potential impacts on desert tortoise that would be adverse and moderate. These impacts would be both short term and long term, and both localized and extensive. To further avoid and minimize impacts on desert tortoise, a number of additional mitigation measures are recommended. Several general mitigation measures would affect impacts on desert tortoise and most other wildlife as discussed above for general wildlife (also refer to Section 3.4.4, "Mitigation Measures," for full mitigation details). Specific to desert tortoise, MM BIO-11 recommends that water used for dust control not be allowed to pool and that all leaks on water trucks and tanks be repaired immediately. The presence of water on project access roads and work areas could attract desert tortoises to the construction site, increasing the probability of impacts~~.~~. MM BIO-12 requires a number of additional desert tortoise-specific measures to further reduce impacts, including the requirement to receive and accept provisions of the Biological Opinion (USFWS)~~, a~~ and 2081 Incidental Take Permit for California state-listed species (CDFG)~~, and compensation to Clark County for impacts to the MSHCP prior to commencing any construction activities~~. In addition, MM BIO-12 recommends year-round monitoring in desert tortoise habitat, preconstruction clearance surveys ahead of not only vegetation-clearing activities but also of vegetation-crushing activities (such as trucks driving over shrubs), and daily clearance surveys of all active worksites in the morning before crews begin work. The measure recommends extension of the monitoring period because tortoises can be active year-round, including winter months, given warm enough temperatures or large rain events. Tortoises can travel relatively far during a day and often use construction equipment and materials as shelter from the sun and wind. Additionally, desert tortoises previously translocated from the project area may return. For these reasons, biological monitors should clear all active sites before the start of construction activities. MM BIO-12 outlines the biological monitoring reporting process, including daily monitoring reports, reports of harm to desert tortoises, and end-of-project summary reports by an authorized biologist. Lastly, MM BIO-12 outlines additional handling guidelines for the California portions of the project, which are to be adhered to in addition to the most current Desert Tortoise Council handling guidelines.

Gila monster and Chuckwalla

The chuckwalla and the Gila monster would be .susceptible to the same impacts as were discussed for special-status reptiles in general. The chuckwalla was observed in the rocky terrain of the Lucy Gray Range and McCullough Range during the biological surveys. The Gila monster was not observed during the biological surveys. Both lizards prefer habitat characterized by rocky terrain that provides adequate crevices for use as winter hibernacula and summer dens.

APM BIO-14, for general wildlife, would avoid or minimize impacts on these two reptiles. The APM prescribes the use of the current NDOW construction site protocols, which provide protections for both the Gila monster and the chuckwalla. As currently designed, the project would have minor, adverse, short- and long-term, and localized impacts on individuals of these species. ~~No mitigation measures are recommended.~~ Impacts to Gila monster in California would require one mitigation measure to reduce impacts to the species. MM BIO-17 involves reporting locations of observed Gila monster to the CDFG for conservation and population tracking purposes.

Mammals

There is the potential for 17 protected mammal species to occur within the proposed project area (Tables 3.4-.5 and 3.4-6 ~~3.4-3 and 3.4-4~~). ~~Three~~ Two of these species were directly observed during surveys: desert bighorn sheep~~, wild burro,~~ and American badger. Sign for wild burro was also found.

Desert bighorn sheep

Impacts to bighorn sheep from the project would be adverse, moderate, and localized. The preferred habitat for desert bighorn sheep within the project area is found within and adjacent to the project in the Clark Mountain, McCullough, and Highland ranges. Both McCullough Range and Highland Range contain crucial habitat and overwintering habitat. The proposed project through McCullough Pass has the potential to impact lambing areas for bighorn sheep. Construction activities within McCullough Pass would cause visual and noise disturbance that could lead to avoidance of the lambing areas by bighorn sheep, which could result in the loss of a breeding opportunity for that season, or could increase the competition at alternate lambing sites in the area. Visual (including human presence and night lighting) and noise disturbance could also decrease reproductive success through abandonment of the lambing grounds during the lambing season. Construction and operation and maintenance within the McCullough Pass would have adverse, moderate impacts that would be both short and long term.

The transmission route bisects the McCullough Range and the communication line bisects the pass between the McCullough Range and the Highland Range. Construction activities might interfere with the movement of sheep between these areas, and might impede natural colonization and inhibit the annual migration of the bighorn sheep from these overwintering ranges to the summer ranges north of the project. The bighorn sheep need to migrate to the north out of the project area during the summer to access water sources. The closest water source is the “Linda” guzzler, approximately 1.3 miles north of the north McCullough Pass.

The area near the Mountain Pass Substation in the Clark Mountain Range has the potential to support desert bighorn sheep. Though no potential lambing areas are currently documented in the Clark Mountain~~s~~ Range, project-related construction and maintenance might adversely impact sheep by causing avoidance of this area. Avoidance could result in decreased access to foraging habitat and could inhibit daily and seasonal movements.

In addition to the general biological APMs listed above, APM BIO-12 would reduce impacts on desert bighorn sheep protections. Through this APM, the applicant would initiate conversations with BLM and the state wildlife resource agencies to determine appropriate conservation and avoidance measures for the bighorn sheep within the project area. As currently designed, the project would adversely impact bighorn sheep and their suitable habitat within the EITP and in adjacent areas. To minimize these impacts, MM BIO-13 is recommended. MM BIO-13 would protect sheep by imposing seasonal limitations on project construction activities in lambing and wintering areas. Additionally, the applicant would conduct preconstruction surveys and biological monitoring during construction within suitable bighorn sheep habitat (the McCullough ~~Mountains~~ Range and the southern Eldorado Valley between the Highland Range and the southern McCullough ~~Mountains~~ Range). Any occurrences of the desert bighorn sheep in Nevada and California would be reported to NDOW and CDFG, respectively, and construction would be temporarily halted if any bighorn sheep were found to be within 500 feet of construction activities. These measures would help ensure clearance of the sheep from project areas and reduce the magnitude of impacts to the sheep.

Wild Burro

~~The wild~~ Wild burro sign was observed in the proposed project area in California. This species would be susceptible to visual and noise disturbance and increased human-burro interactions on a dialy basis during construction activities and operation and maintenance, potentially resulting in changing its behavior to avoid the site. This could cause avoidance of suitable habitat and energetic costs to locate other suitable habitat. This would result in adverse short- and long-term impacts through loss of food and suitable habitat.

The general APMs described above for wildlife would help avoid and minimize potential impacts to the burro~~; no mitigation measures are recommended.~~ Additionally, the burros will likely clear the project areas during active construction. There would be no significant change in the existing conditions of disturbance currently experienced by wild burros in the area during operations and maintenance activities within the ROW. No further mitigation measures are recommended.

American Badger

Suitable habitat for the American badger exists within the project. Badgers are most likely to occur on upper bajadas, where greater plant species diversity and cover provides better habitat for prey species. There was one observation of an American badger near the Eldorado Substation, and badgers were observed during surveys at the nearby ISEGS site (~~CEC 2008~~ BLM 2010). If badgers were present on the proposed project site during construction, there would be the potential for death due to the collapse of occupied burrows during clearing and grading. Visual and noise disturbances could trigger habitat avoidance behavior that could hinder successful foraging and breeding for individuals in the immediate area. Badgers are primarily nocturnal animals, and thus, any night lighting or construction could disturb this species. Loss of forage and nest habitat by proposed project construction would reduce available suitable habitat within the badger's range. However, the amount of permanent habitat lost (~~less than~~ approximately 55 acres ~~51 acres~~) is relatively small compared with the total amount of available suitable badger habitat within this area.

The general APMs described above for wildlife would help avoid and minimize potential impacts to the badger. As currently designed, the project would have moderate, adverse, short- and long-term, localized impacts on individuals of this species. To further reduce impacts, MM BIO-8 and BIO-14 ~~is~~ are recommended. ~~This measure~~ MM BIO-8 would limit the intensity of night lighting and thus reduce potential impacts to the badger. MM BIO-14 would reduce the magnitude of impacts to badgers by using a qualified biologist to conduct preconstruction surveys and establishing a relocation protocol for any active badger burrow identified on the project.

Birds

Construction of the proposed project could cause adverse impacts on avian species, including nesting raptors and birds protected by the MBTA. Impacts on these bird species would typically result from activities that would cause nest abandonment or destruction of chicks or eggs in active nests or death of adults due to collision, or activities that would reduce potential forage and nesting habitat. For most species, the proposed project impacts would be confined to project areas and areas immediately adjacent to the project. For other species such as raptors, project-related impacts could extend up to a mile or more beyond project boundaries, depending on the nature of the site (e.g., urban or rural) and topography.

Active bird nests in shrubs or near the ground would be susceptible to being crushed during clearing and grading operations, and during any activities where vegetation would be crushed. Noise and visual disturbance caused by construction and project-related traffic, including construction at work sites and traffic along project access roads and spur roads, could cause nest abandonment or habitat avoidance by birds nesting on or off site in adjacent areas. Nest abandonment would result in death to chicks and hatching failure of eggs. Alternatively, construction might cause birds to avoid suitable habitat and opt to nest or forage in less suitable habitat. Such impacts could cause energetic costs to these birds and could indirectly contribute to stress, unsuccessful reproductive efforts, or death. Decreased foraging success due to habitat avoidance or removal of foraging habitat could decrease the survival of chicks in nests near the project. Because these impacts could occur at isolated nest sites along the project corridor, and because the project area is relatively small compared with the amount of similar habitat in the region, impacts on nesting birds would be localized.

Construction of new access roads or spur roads could increase the volume of recreational traffic, and, in turn, indirectly increase the potential for nest abandonment due to noise and visual disturbances by humans. Construction of earthen berms or gates to restrict post-construction recreational vehicle access tends to have low success rates, as most off-road vehicles can simply bypass these structures in the relatively flat topography of the desert. Construction of new transmission line towers, or larger ones to replace old towers, could increase the risk of death of adult raptors and larger non-raptor species by collision (APLIC 2006).

Disturbances associated with the operation and maintenance of the project could cause impacts similar to those caused by construction of the project, although operations and maintenance impacts would likely be less intense. Noise and visual disturbances caused by operations and maintenance crews could cause abandonment of active nests, which would result in the death of chicks or hatching failure of eggs. Raptors often occupy nests built onto transmission line towers or poles. Nest abandonment caused by noise and visual disturbances is likely, as well as increased susceptibility of chicks to death and/or hatching failure of eggs from falls or from being crushed if active nests were moved or disturbed during operations and maintenance. Such impacts could occur to active nests on transmission line towers or other project facilities, but could also occur outside of established access roads, spur roads, and tower sites. The potential for these impacts on nesting birds after the construction phase of the project is relatively small. In general, due to the lower levels of disturbance associated with operation and maintenance activities, post-construction adverse impacts on raptors would be short term and localized. ~~Cumulative mortality by bird strike against towers would be greater during the operations phase, although the potential for this impact would be low.~~ Due to the lower levels of disturbance associated with operations and maintenance activities, any adverse impacts on birds or raptor species would be minor, short term, and localized.

All construction activities and traffic related to the proposed project would have the potential to cause adverse impacts on MBTA-protected birds and nesting bird species; however, construction of certain segments of the project would have a greater potential for impacts than other segments. Installation of the proposed redundant telecommunications line may involve relatively less intensive construction methods. Although a number of existing towers of the existing Eldorado–Lugo transmission line would need to be retrofitted, no new towers would need to be constructed. The redundant telecommunications line would either be attached to existing towers, or, for a short segment near the town of Nipton, California, be installed in a newly excavated narrow trench in a roadside shoulder. Due to the less intensive construction methods associated with the redundant telecommunication line, impacts to MBTA-protected birds and nesting bird species would be less intense than impacts from the construction of the proposed transmission route.

~~No surveys for nesting birds, raptors, or nests were conducted for the proposed project, although the applicant plans to commence raptor and raptor nest surveys in spring 2010. Biologists reported several stick nests in various stages of construction during 2008 field surveys for desert tortoise.~~ No surveys for nesting songbirds or gamebirds were conducted for the proposed project. During the 2008 surveys, biologists observed three red-tailed hawk nests; two of the nest were located to the northeast of the Mountain Pass Substation along the Mountain Pass Alternative and one nest along the proposed project in McCullough Range. Biologist also surveyed for raptor nests during the winter and spring of 2010. No raptor nests were observed; however, one stick nest was observed along the Eldorado–Lugo telecommunication route and was determined to most likely be a common raven nest. During the 2008 field surveys for desert tortoise, biologists reported several stick nests in various stages of construction. These nests were in transmission line towers or poles~~,~~ and were determined to be likely built by common ravens or a raptor species. It is likely that most areas of the proposed project provide suitable nesting habitat for at least some bird species that are protected by the MBTA. Much of the route supports healthy and mature creosote shrubs, interspersed with yucca and cactus species on flats, and acacia and other desert riparian species along the edges of washes. These areas provide suitable nesting habitat for a number of desert-dwelling bird species, including smaller raptor species. The entire project is within the range of a number of raptor species. ~~One~~Two golden eagles ~~was~~ were observed—one soaring during desert tortoise surveys conducted on the California segment of the transmission alignment and one near the Eldorado Substation during the 2010 raptor survey. Several red-tailed hawks were observed near project areas in both Nevada and California during both the desert tortoise surveys and the raptor survey. The 2010 raptor survey resulted in the observation of one peregrine falcon east of Primm, Nevada; one prairie falcon near the Eldorado Substation; two America kestrels—one near Mountain Pass and one west of McCullough Pass; and one Cooper's hawk north of Highway 164 along the Eldorado–Lugo route. Although a large number of existing transmission lines are present in and near project areas, relatively few potential raptor nests were observed. This may indicate a depressed or naturally low presence of raptors or nesting habitat in the project area. Trees and cliff sides in nearby mountain ranges, including Clark Mountain, the Lucy Gray Range, the Highland Range, and the McCullough Range, likely provide more suitable nesting habitat for raptors than the relatively flat creosote shrub areas that typify project areas. The proposed project crosses ~~two~~ one such mountainous area~~s~~. Golden eagles are known to frequent the north McCullough Pass area of the project. The proposed redundant telecommunications line in the southern McCullough Range would also cross higher elevations that may provide higher quality raptor nesting habitat.

In addition to general APMs for biological resources, the applicant has incorporated a number of measures into the project design to avoid or minimize direct and indirect impacts on bird species, including:

- Avoid impacts to active nests (APM BIO-7)
- Use avian-safe building standards (APM BIO-8)

Implementation of the proposed project with APMs would result in potential impacts on bird species that would be adverse and moderate. These impacts would be both short and long term, and localized. To reduce impacts on MBTA bird species and raptors, a number of additional mitigation measures are recommended. Several general MMs would reduce the impacts on birds and other wildlife (refer to Section 3.4.4, "Mitigation Measures," for full MM details). MM BIO-1 recommends preconstruction surveys ahead of vegetation-clearing equipment at the time of clearing if construction is scheduled to occur during breeding season (late February through early July). If construction occurred during breeding season, new nests or nests that were missed during earlier preconstruction surveys would be detected at this time. Also, ground nesting raptors could enter the project area after preconstruction surveys had been performed; additional preconstruction surveys at the time of vegetation clearing would detect these nests. MM BIO-8 recommends that night lighting be reduced during construction, operations, or maintenance activities in all project areas with sensitive resources, including nesting bird species. MM BIO-10 recommends that biological monitors be present during construction in all construction areas where sensitive biological resources are potentially present, not just in areas where presence has been confirmed. Biological monitors would survey project areas with active construction daily and report all detections of new active nests.

Specific to all MBTA bird species and raptors, MM BIO-15 recommends a number of additional measures to further reduce impacts. MM BIO-15 protects active bird nests on or near project areas by requiring disturbance buffers around nests. Because no standardized disturbance buffers exist for birds in this region, the applicant would consult CDFG or NDOW (depending on the state the nest is in) to determine appropriate buffer sizes. Buffers would remain in effect until all eggs hatched and chicks fledged. For raptors, standardized buffers from the USFWS Utah Field Office are recommended for all raptors with the exception of burrowing owls (discussed below; USFWS 1999). All raptor and raptor nest surveys should use these USFWS buffer guidelines when determining the appropriate survey corridor width. MM BIO-15 outlines reporting procedures if active nests are detected on or near the project area, and authorizes the biological monitor to halt construction activities if it is determined that such activities would disturb nests. Lastly, MM BIO-15 requires consultation with NDOW prior to construction for segments of the project that pass by the Wee Thump Joshua Tree Wilderness area if construction is scheduled to occur during breeding season.

Special-Status Birds

Special-status bird species could occur within the proposed project area; the following were observed during the biological surveys: the golden eagle, peregrine falcon, prairie falcon, western burrowing owl, loggerhead shrike, LeConte's thrasher, and phainopepla. ~~The latter three~~ Many of these species could use the area for foraging and nesting. These birds would be susceptible to visual and noise disturbance as described above, potentially resulting in alteration of foraging behaviors to avoid the site and nest abandonment. Individuals of these species would be at risk if they were using onsite vegetation for nesting, as clearing of vegetation could result in the direct loss of nests and would also remove potential forage habitat. The project would result in direct, short- and long-term loss of food and shelter for special-status birds.

Golden Eagle

Construction and operation of the proposed project could cause adverse impacts on golden eagles and golden eagle habitat. Impacts on this species could result from mortality of adults and/or chicks, hunting and energetic interference, nest abandonment, hatching failure of eggs in active nests, or because the project otherwise led to lowered reproductive success.

The construction of the proposed project may result in 'take' of this species. Project construction and traffic could cause abandonment of potential active nests located in onsite mountain ranges due to the noise and visual disturbances associated with these activities and could thus result in mortality of chicks or hatching failure of eggs. Potential for this impact to occur is less likely as no known active eagle nests have been located with the McCullough Range. However, it is very likely that construction disturbances could cause avoidance of suitable foraging habitat or nesting habitat within the project area. Approximately 443 acres of forage habitat could be affected by construction and approximately 25 acres of potential nesting habitat (i.e., those areas of the proposed project located in mountainous terrain) disturbed. This would not result in a substantial amount of foraging or potential nesting habitat affected within the larger surrounding territory available to the eagle. This impact is expected to be minor and not likely to reduce the success of eagles with known breeding territory within 10 miles of the project. The impacts resulting from construction as described above would be adverse, minor, short- and long-term, and localized.

Project operations and maintenance would also have the potential to cause injury and/or mortality as a result of injuries suffered from accidental collision or electrocution with power lines and the associated structures. The proposed project would upgrade the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line to a 230-kV transmission line. The risk of collisions and electrocution are likely low from this upgrade as the proposed project would primarily be constructed in the ROW of the existing line to which birds would already be habituated. Additionally, the replacement of lattice towers with tubular poles would potentially reduce perching opportunities for the eagle, thus potentially reducing electrocution risk. Risk would be further reduced as the proposed new transmission lines and poles will be constructed according to APLIC standards (APM BIO-8), which are designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (APLIC 2006). However, collisions and electrocutions could still occur to some individuals during operations. Due to a lack of current data on eagle mortalities from collision and electrocution in the project area, it is currently unknown to what extent such incidents would have on any breeding population of golden eagles in the EITP area. However, a lack of documented mortalities in the area implies that eagles currently co-exist with the existing transmission line infrastructure and that collision risks associated with reconductoring of the line are not expected to be significantly greater than the existing condition. Thus, the impacts resulting from operations as described above would be adverse, minor, short-term, and localized.

To reduce impacts on golden eagles, MM BIO-19 is recommended. MM BIO-19 requires development and implementation of an Avian Protection Plan according to recent USFWS guidance (USFWS 2010). This Plan will outline steps and conservation measures to prevent and reduce impacts on golden eagles and other large raptors. Implementation of this measure would provide compliance with the 'no net loss' standard for golden eagles identified in the Eagle Act Rule, and reduce the overall impacts on the species to adverse and minor.

Burrowing owl

Construction of the proposed project could cause adverse impacts on western burrowing owls and burrowing owl habitat. Impacts on this species would result from nest abandonment or direct death of adults and/or chicks, or hatching failure of eggs in active nests, or because the project otherwise led to lowered reproductive success.

Burrowing owl nests in underground burrows would be susceptible to crushing during clearing and grading, or during any other activity where vegetation would be crushed. This would likely cause the mortality of chicks (and adults if they remained in the burrow) and hatching failure of eggs. Although adult and juvenile owls would likely flee occupied burrows at the threat of on-coming construction equipment, a small potential for death by crushing exists outside of breeding season. As previously discussed, all project construction and traffic could cause abandonment of nearby active nests due to the noise and visual disturbances associated with these activities, and would thus result in mortality of chicks or hatching failure of eggs. These disturbances could cause habitat avoidance if owls avoided using suitable burrows for nesting or avoided high-quality foraging habitat. Burrowing owl nesting and foraging habitat could be lost due to ground disturbance and construction of permanent structures. The impacts resulting from construction as described above would be adverse, moderate, short and long term, and localized.

Disturbances associated with project operations and maintenance would have the potential to cause impacts similar to those caused by construction of the project, although these disturbances are infrequent and thus impacts would likely be less intense. Burrowing owls usually occupy abandoned mammal burrows, which are often found in disturbed areas. Once construction activities were complete, burrowing mammals would be likely to re-colonize project areas, providing new burrows for potential owl nests. Burrowing owls that move onto project areas after construction is complete would be susceptible to vehicle collision or being crushed by operations and maintenance vehicles. The likelihood of this happening is low, given that maintenance activities would be infrequent. Nearby active nests could be abandoned due to the noise and visual disturbances associated with operations and maintenance crews. In general, due to the lower levels of disturbance associated with operations and maintenance activities, any adverse impacts on burrowing owls would be short term, localized, and minor.

The project is situated entirely within the range of the Western burrowing owl, and suitable burrowing owl habitat exists in most of the project area. ~~One burrowing~~ Burrowing owl sign in the form of a pellet was observed during field surveys conducted in 2008 near Transmission Alternative Route C on the California side of the project. Burrowing owls were also observed on the proposed ISEGS site (~~CEC 2008~~ BLM 2010). No protocol-level burrowing owl surveys were conducted in or near any project areas. Suitable burrowing owl habitat exists along most of the proposed project, and it is likely that burrowing owls nest within the project area.

In addition to the general biological APMs, APM BIO-13 would reduce impacts specific to burrowing owls. This APM outlines survey and avoidance measures during both breeding and non-breeding seasons for burrowing owls and their burrows. Implementation of the project with all APMs would result in potential impacts on burrowing owls that would be adverse, moderate, both short and long term, and localized.

To reduce impacts on burrowing owls, additional mitigation measures are recommended. Several general MMs would reduce impacts on burrowing owls, as discussed above for all bird species. Specific to burrowing owls, MM BIO-16 recommends a number of additional measures to further reduce impacts, including the requirement to perform preconstruction surveys within 30 days prior to construction in any given area of the project if construction is scheduled to occur during owl breeding season (February 1 through August 31). APM BIO-13 defines the burrowing owl breeding season as mid-March to August; however, MM BIO-16 recommends assuming a breeding season from February 1 through August 31, as defined by the California Burrowing Owl Consortium (CBOC 1993, CDFG 1995). If an active burrowing owl nest were identified, as determined by a qualified biologist, no activities would occur within approximately 160 feet (50 m) of the burrow until the eggs had hatched and all chicks had fledged. This 50-m disturbance buffer is recommended by the California Burrowing Owl Consortium and has been adopted by the State of California (CBOC 1993, CDFG 1995). There is a small potential for active burrowing owl nests to be present outside of project boundaries, where they would not be collapsed, yet within the 50-m buffer; construction activities in these areas would be delayed until all chicks had fledged. MM BIO-16 outlines the survey and biological monitoring reporting process, including provision of GPS locations of burrows, daily monitoring reports, reports of harm to burrowing owls, and end-of-project summary report by the authorized biologist. Lastly, for the California portions of the proposed project, a Burrowing Owl Mitigation and Monitoring Plan will be submitted to CDFG for review and approval prior to relocation of owls, and the project proponent will compensate for the direct loss of burrowing owl nesting and foraging habitat as outlined by CDFG.

Areas Requiring Special Management ~~Areas~~

Considerations

The project has the potential to directly and indirectly impact biological resources on special management areas within and adjacent to the EITP. The project crosses the Ivanpah DWMA ACEC and the Puite-Eldorado ACEC, both of which contain significant amount of critical habitat for the desert tortoise. Adverse impacts to these ACECs would occur with implementation of the proposed project, as specifically discussed above for desert tortoise. Several BLM wilderness areas, the Wee Thump Joshua Tree Wilderness Area and the South McCullough Wilderness Area, as well as the Mojave National Preserve, could be impacted by construction and operation. While the project footprint would be outside of the boundaries of these areas, indirect impacts to species utilizing these areas could occur. Impacts on nearby nesting birds, and reptiles and mammals using these areas as migratory corridors, could result from construction noise, increased human presence and traffic, and the use of night lighting. However, these impacts would be expected to be minor, short-term during construction, and localized to the fringe boundaries of these preserves.

The proposed project would be constructed mostly within the boundary of BLM-managed utility corridors; however, less than one mile would cross outside of the corridor into the BCCE conserved land at MP 2 along an existing 70-foot ROW before reconnecting with an adjacent designated corridor to the south and continuing east to the Eldorado Substation. Impacts to the BCCE would include loss of habitat for conserved species through vegetation removal and potential impacts to species from construction and operation-related disturbances (i.e., noise, traffic, night lighting increases). However, because the majority of the line would lie within an existing ROW, significant new disturbance to habitat would not occur. Construction of the EITP along the existing ROW, even though it falls outside of the BLM-designated utility corridor, would also be compatible with the Clark County MSHCP because the primary purpose of the plan is to minimize adverse impacts on natural resources within the BCCE. Impacts to habitat and species from construction and operation could be potentially adverse and significant, and thus mitigation is required. Construction of the proposed project within the BLM-designated utility corridor is an allowable use; however, construction on the portion outside of the utility corridors would require approval from Clark County and Boulder City as required by MM LU-1 (see Section 3.9). This mitigation measure would ensure that all APMs and BMPs (including the use of herbicides) proposed for this project are in compliance with the BCCE agreement by requiring early compliance discussions with Boulder City and Clark County. With incorporation of this mitigation measure, impacts would be minor and short- and long-term.

Construction of the EITP may be in direct conflict with active restoration projects that are funded by the Clark County MSHCP. The EITP could potentially disturb these restoration areas by crushing and/or removal of vegetation, as well as potential propagation of invasive vegetation. APMs BIO-2, -4, -6, and -9 through -11 would provide avoidance and minimization of impacts on these restoration areas. Additionally, MM BIO-2, -3, -4, and -10 and MM LU-1 are needed to reduce adverse impacts on restoration zones to minor and less than significant. These measures require further coordination between the applicant and the appropriate federal, state, and county resource agencies. They also require the applicant to adhere to standard land management policies of these agencies. With incorporation of these mitigation measures, impacts to Clark County MSHCP-funded restoration activities would be minor and less than significant.

NEPA Summary

As currently designed, construction, operations, and maintenance activities associated with the proposed project would have impacts on native vegetation, local wildlife, and special-status plants and wildlife. Incorporation of recommended mitigation measures would reduce impacts on these resources through avoidance and minimization. After mitigation implementation, impacts on native desert vegetation and special-status plants would be minor and localized. Direct and indirect impacts to wildlife would be reduced to minor and localized.

For specific wildlife species, impacts would vary. After incorporation of recommended mitigation, impacts on desert tortoise and suitable and critical habitat for the tortoise due to construction of the project would be adverse~~, moderate~~ major, both short-term and long-term, and localized. ~~However, if a significant number or length of new access roads and spur roads were necessary for construction of the project, impacts on desert tortoise habitat could be considered major and extensive.~~ As currently designed, the project would have minor adverse, short- and long-term, localized impacts on Gila monster and chuckwalla. Adverse impacts to desert bighorn sheep would be localized and minor, with both short- and long-term impacts with incorporation of mitigation. Mitigation would reduce the adverse impacts on American badger to localized, minor, and short and long term. After mitigation, impacts on MBTA bird species, including raptors, would be adverse, minor, short and long term, and localized. Many of the potential impacts to birds would be avoided altogether if vegetation clearing occurred prior to breeding season. If construction were scheduled to occur during breeding season, the applicant would clear vegetation before the onset of breeding season. Recommended mitigation for burrowing owl would reduce impacts, which would be adverse and short and long term, to localized and minor.

In summary, the proposed project would significantly affect biological resources in an adverse manner.

CEQA Significance Determinations

IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species
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The proposed project would result in impacts on special-status plants as discussed above in the NEPA summary discussion. However, MMs BIO-1, 2, and 3 would reduce impacts to less than significant because preconstruction surveys would identify the location of any special-status plants so they could be avoided by project activities. If plants could not be avoided, mitigation for impacts would occur in the form of salvage and/or restoration efforts for vegetation and soils.

IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife
~~otentially signifi ant~~ ignifi ant

The proposed project would result in impacts on several special-status wildlife species and their habitat as discussed above in the NEPA summary discussion ~~section~~. Those species include reptiles, mammals, and birds, with potential for significant impacts to desert tortoise, desert bighorn sheep, American badger, and burrowing owl. However, MMs BIO-8 through BIO-16 would reduce impacts to less than significant, except for desert tortoise; impacts to desert tortoise and its habitat would be significant even after mitigation. Parameters for preconstruction surveys and the use of biological monitors would be specific to species to prevent impacts on those species. Surveys would identify the location of any special-status wildlife so avoidance measures could be incorporated. If avoidance of direct and indirect impacts to wildlife were not possible, those impacts would be mitigated by species-specific measures detailed in MMs BIO-12 through BIO-16.

~~As mentioned in the NEPA discussion, impacts to the desert tortoise and its habitat would be significant even after mitigation if an extensive amount of new access and/or spur roads were proposed.~~[6]

IMPACT BIO-3: Temporary and permanent losses of native vegetation communities
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The proposed project would result in impacts on sensitive desert vegetation communities, including cacti and yucca species, as discussed above in the NEPA ~~section~~summary. However, MMs BIO-1 through BIO-3 would reduce impacts to less than significant with the use of preconstruction surveys, avoidance techniques, and post-construction restoration.

IMPACT BIO-4: Introduction of invasive, non-native, or noxious plant species
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The proposed project would result in impacts on sensitive vegetation and wildlife communities if invasive, non-native, or noxious plant species were introduced and/or spread within the project area as discussed above in the NEPA

[6] ~~NOTE: Final impact analysis for the tortoise will be completed pending final survey data and engineering details from the applicant.~~

~~section~~ summary. However, MM BIO-4 would reduce impacts to less than significant with implementation of a rigorous Invasive Management Plan.

IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands
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The proposed project would result in impacts on jurisdictional waters~~,~~ and drainages, ~~and wetlands,~~ as discussed in the summary of NEPA ~~section~~ impacts above. However, MMs BIO-5 through BIO-7 would reduce impacts to less than significant because the applicant would perform a final jurisdictional determination to identify drainages and wetlands located within the proposed project area. These areas would then be avoided. If avoidance were not possible, drainage crossings would be engineered to reduce degradation and impacts (MM BIO-6) and restoration and compensation measures would be implemented (MM BIO-7).

IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites
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The project would result in impacts to the movement corridors, migratory paths, or critical nursery sites for certain species. Impacts would occur to big game corridors (desert bighorn sheep), general wildlife corridors for species such as large reptiles and wild burro, lambing areas for desert bighorn sheep, and critical habitat found within the EITP area that would be potentially used as a movement corridor by desert tortoise. As discussed in the summary of NEPA ~~section~~ impacts, primary impacts to species that would also affect movement corridors and nursery areas would occur from noise and visual disturbances generated during construction, operations, and maintenance. Impacts include stress to animals, potential death, and avoidance of known corridors or nursery sites by species. Some of the proposed project occurs within an existing ROW, and disturbances would be relatively short term due to the linear nature of construction for the transmission and telecommunication lines. Operations and maintenance activities would likewise be short term due to the lower frequency of vehicle and equipment use. Impacts at the proposed Ivanpah Substation would be longer term, as existing natural vegetation would be replaced with impervious surfaces and permanent structures.

Impacts to corridors and nursery sites would be mitigated by numerous proposed mitigation measures (see NEPA discussion and Section 3.4.4 for details). Specifically, MMs BIO-1, BIO-8, BIO-10, and BIO-12 through BIO-16 would provide protection primarily through avoidance of sensitive movement and nursery areas. With the incorporation of mitigation, impacts would be reduced to less than significant.

IMPACT BIO-7: Conflict with the provisions of local ordinances or policies
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The proposed project could conflict with local tree preservation and riparian protection ordinances. San Bernardino County requires retention of existing native desert vegetation, in particular Joshua trees, Mojave yuccas, and creosote rings. The project could remove existing desert vegetation during construction. The county also requires setbacks from riparian areas and prohibits removal of vegetation within 200 feet of a stream. Impacts to stream riparian vegetation ~~might~~ would occur during construction of the project. The applicant proposes to minimize disturbance to vegetation by flagging and avoiding native plants and by minimizing impacts to streams (APM BIO-2 and BIO-3). However, if sensitive desert and riparian vegetation could not be avoided, the proposed project would result in significant impacts and directly conflict with the San Bernardino County ordinances.

With implementation of MMs BIO-2 and BIO-3, vegetative communities will be restored by the relocation of plants, reseeding, and/or land compensation. If communities cannot be restored, the applicant will compensate in accordance with consultation with appropriate agencies. Implementation of these measures would reduce impacts to less than significant.

~~**NO IMPACT. Impacts to the Clark County MSHCP and the BCCE.** The proposed project would result in impacts on biological resources (Impacts BIO-1 through BIO-6) on lands under the jurisdiction of the Clark County MSHCP and the BCCE, as the transmission and telecommunication lines cross lands preserved by these plans. Species specifically targeted for conservation and protection by these plans would be potentially impacted by the project.~~

IMPACT BIO-8: Conflict with the Provisions of the Clark County MSHCP
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The proposed project would result in impacts on biological resources (Impacts BIO-1 through BIO-6) on lands under the jurisdiction of the Clark County MSHCP, as the transmission and telecommunication lines cross lands conserved by these plans. Species specifically targeted for conservation and protection by these plans would be potentially impacted by the project. Additionally, the project intersects numerous areas that have undergone MSHCP mitigation actions by the BLM, such as re-vegetation restoration efforts, noxious weed removal, and fencing associated with desert tortoise protection (see Figures 5-1 and 5-5). These restoration areas could be impacted by vegetation removal and the potential introduction of noxious weeds. These impacts would be long-term and significant, thus mitigation is required to reduce impacts.

The applicant would be required to initiate discussions with Clark County ~~and Boulder City~~ about appropriate fee-based compliance and other mitigation strategies to ameliorate biological impacts on non-federal lands as discussed in MM-LU-1, Section 3.9, "Land Use." This compliance would be directly based on the provisions of the MSHCP ~~and the BCCE. Thus, by complying with these provisions, there would be no impact to habitat conservation plans within the proposed project boundaries. Additionally,~~ Compliance for the MSHCP would cover those biological species protected by the MSHCP. Thus, by complying with these provisions, impacts to the MSHCP within the proposed project boundaries would be reduced to less than significant. The construction of the EITP, as proposed along the existing ROW, would be ~~more~~ compatible with the primary purpose of the MSHCP, which is to minimize adverse impacts on natural resources within the ~~BCCE, than Transmission Alternative Routes A and B, which would disturb more habitat than the proposed route~~ HCP conservation area.

3.4.3.6 No Project / No Action Alternative

Under the No Project Alternative, the proposed project would not be constructed, and impacts associated with the proposed project would not occur. The No Project Alternative would have no adverse impact on existing biological resources in the proposed project area. However, it would not help increase the feasibility of using alternative energy sources, although increase use of alternative energy could have beneficial impacts on biological resources.

3.4.3.7 Transmission Alternative Route A

This alternative would begin at the Eldorado Substation and deviate from the proposed transmission line between milepost (MP) 1 and MP 7 using a new 130-foot ROW adjacent to the existing Los Angeles Department of Water and Power (LADWP) transmission corridor. Critical issues for this alternative include impacts to native vegetation communities, habitat for special-status plants and wildlife, and special management areas. Transmission Alternative Route A would cross the same habitat type (creosote-white bursage scrub) as the proposed project and would result in similar types of impacts but would result in a net increase in the extent and magnitude of direct and indirect impacts associated with placement of new towers and creation of new ROW and spur roads.

Transmission Alternative Route A would ~~reduce the number of total towers needed from five to four~~fall entirely within a BLM designated corridor but would require ~~2.3 miles~~ 5 miles of new ROW. Construction would increase total permanent impacts by ~~8 acres~~ 3.5 acres and temporary impacts by ~~62.2 acres~~ 62.6 acres in previously undisturbed desert habitat. The increase in impacted acreage could result in a net increase in the direct and indirect loss of habitat for listed or sensitive plant species. Direct loss of habitat for special-status species might result from removal of vegetation, grading of soils, or sedimentation during the course of construction. Indirect loss of habitat might result from introduction and spread of invasive and noxious weeds, loss of native seed banks, changes to the topography and drainage of a site, and dust generation from use of construction equipment and transport of materials. No jurisdictional drainages or washes were identified within Alternative A; thus, there would be no impacts to these systems from this alternative, which is the same as for the proposed project.

The increase in acreage impacts would increase the potential for disturbing wildlife or causing wildlife mortality. The primary impact would be to desert tortoise and desert tortoise habitat, as this alternative passes through previously undisturbed suitable habitat including a section in designated desert tortoise critical habitat (Piute-Eldorado Unit). All impacts from construction activities of this alternative within designated critical habitat would be permanent in terms of restoration requirements, mitigation, and compensation. Although this alternative would decrease the total distance the transmission line would cross the Piute-Eldorado Critical Habitat Unit from approximately 8.3 miles to 7.9 miles (Table 3.4-8 ~~3.4-6~~), the 5 miles of new ROW needed would increase permanent disturbance to tortoise habitat.

The results of the desert tortoise surveys for this alternative found a greater amount of tortoise sign (e.g., scat, tracks, tortoise, burrow, shell) within Alternative Route A than within the corresponding portion of the proposed project. However, density calculation of desert tortoise for this alternative and all others ~~has not yet been compared with the density of desert tortoise activity along the proposed transmission line route, pending applicant discussions with the USFWS on appropriate methods.~~ could not be calculated due to the absence of live tortoises observed within the 100 percent coverage survey area, which is required to calculate tortoise density based on USFWS 2010 Desert Tortoise Pre-project Survey Guidance document. Although this alternative would increase the acreage of desert tortoise habitat permanently impacted, there would be no change in the duration or severity of impacts as a result of the construction of Alternative Route A. Though no additional listed or sensitive species were identified along this alternative during the biological surveys, there is the potential for listed or sensitive wildlife species to occur during construction or maintenance due to the presence of suitable habitat. ~~Surveys are still ongoing; for instance, burrowing owl and raptor surveys will be conducted in 2010. Thus, pending results, analysis of impacts to these species for this alternative (and for other alternatives) cannot be completed. Although site-specific data is not complete at this time, analysis of potential impacts to listed and sensitive species is still possible without all the data (40 CFR 150.22) and by assuming a high likelihood of species presence. Additionally, the APMs and proposed MMs will be sufficient to reduce impacts to less than significant for these species for this alternative (and for other alternatives).~~ This could be particularly true for burrowing owl and nesting birds, which can move onto a project site from one season to the next if suitable habitat is available. With the exception of desert tortoise, the APMs and proposed MMs would be sufficient to reduce impacts to less than significant for special status wildlife species for this alternative.

~~The alternative would result in impacts on the Clark County MSHCP and the BCCE, as the entire alternative lies outside a pre-existing ROW within lands preserved by these plans. Biological resources and species targeted for conservation and protection by these plans, particularly the desert tortoise, would be potentially impacted by the project. However, MM BIO-1 through BIO-16 would significantly reduce biological impacts. Furthermore, the applicant would be required to initiate discussions with Clark County and Boulder City concerning additional fee-based compliance and mitigation measures to ameliorate biological impacts. This compliance would be directly based on the provisions of the MSHCP and the BCCE. Impacts to provisions of the plans would be reduced to less than significant with the incorporation of results from biological mitigation and compliance discussions.~~

Transmission Alternative Route A would bypass the segment of the proposed transmission line alignment between MP 1 and MP 7 and would be constructed entirely within a BLM-designated utility corridor, thus avoiding potential conflicts with the BCCE and Clark County. However, the alternative would result in impacts on the Clark County MSHCP and the BCCE, similar to the proposed project. Biological resources and species targeted for conservation and protection by these plans, particularly the desert tortoise, would be potentially impacted by the project. However, MM BIO-1 through BIO-18 and MM HAZ-1 would significantly reduce biological impacts by requiring workers to adhere to best practices, which would reduce impacts on the surrounding land uses in the BCCE. Impacts to provisions of the plans would be reduced to less than significant with the incorporation of these measures.

Both the proposed project and Transmission Alternative Route A would result in adverse, localized, short-and long-term impacts to biological resources. ~~Impacts from the proposed project would be minor to moderate, while impacts from Alternative Route A would be moderate. From a CEQA perspective, Transmission Alternative Route A would result in less than significant impacts with the incorporation of proposed mitigation measures.~~ However, impacts to desert tortoise critical habitat from Alternative A would be considered significant, adverse, and long term after mitigation because previously undisturbed designated critical habitat would be permanently removed. Therefore, with respect to biological resources, Transmission Alternative Route A would have greater impacts than the proposed project.

3.4.3.8 Transmission Alternative Route B

Transmission Alternative Route B would begin at the existing Eldorado Substation and would replace MP 1 to MP 2 of the proposed route. Several of the overhead utility lines might have to be modified or relocated to accommodate this alternative.

Alternative Route B would result in types of impacts similar to those of the proposed route but would result in a net increase in the extent and magnitude of direct and indirect impacts associated with placement of new towers and creation of new ROW and spur roads. Alternative Route B would result in an additional ~~3.7 miles of transmission line and~~ 5.6 miles of new ROW, which would increase the acreage of permanent and temporary impacts by ~~10 acres and 129 acres~~ 7.5 acres and 130 acres, respectively, to the native vegetation community. No jurisdictional drainages or washes were identified within Alternative B. This alternative ~~could~~ would result in ~~fewer~~ no crossings of intermittent streams ~~than~~ similar to the proposed project~~, which~~ and thus there would be ~~a decrease in~~ no change to impacts ~~to~~ on desert wash habitat and wildlife using this habitat.

~~Although the magnitude of impact for the proposed project using Alternative B would be slightly greater than when using Alternative A due to the additional total miles, impact types would be the same for both alternatives.~~ Primary impacts resulting from Alternative B would include loss of habitat for and potential disturbance to wildlife and special-status species. Though no listed or sensitive species were identified along this alternative by the biological surveys, there is the potential for listed or sensitive wildlife species to occur during construction or maintenance due to the presence of suitable habitat.

Compared with the proposed project, Alternative Route B would increase impacts to desert tortoise. As previously discussed for Alternative Route A, the increase in acreage of both permanent and temporary impacts from Alternative Route B would increase the potential for direct and indirect loss of desert tortoise and direct loss of tortoise habitat. Alternative Route B does not pass through designated desert tortoise critical habitat as does Alternative Route A, but suitable habitat for the species is present. The results of the desert tortoise surveys found a similar amount of tortoise sign in Alternative Route B as in the corresponding portion of the proposed project. ~~However, density calculations of desert tortoise in this area can only be estimated and assumed to be similar to those in adjacent critical habitat, pending applicant discussions with the USFWS on appropriate methods for these calculations.~~ However, density calculation of desert tortoise for this alternative and all others could not be calculated due to the absence of live tortoises observed within the 100 percent coverage survey area, which is required to calculate tortoise density based on USFWS 2010 Desert Tortoise Pre-project Survey Guidance document.

~~Transmission Alternative Route B would result in impacts on the Clark County MSHCP and the BCCE, as the entire alternative lies outside a pre-existing ROW within lands preserved by these plans. Biological resources and species targeted for conservation and protection by these plans, particularly the desert tortoise, would be potentially impacted by the project. However, MM BIO-1 through BIO-16 would significantly reduce biological impacts. Furthermore, the applicant would be required to initiate discussions with Clark County and Boulder City about additional fee-based compliance and mitigation measures to ameliorate biological impacts. This compliance would be directly based on the provisions of the MSHCP and the BCCE. Impacts to provisions of the plans would be reduced to less than significant~~

~~with the incorporation of biological mitigation and results of compliance discussions.~~

Similar to Transmission Alternative Route A, Transmission Alternative Route B would bypass the segment of the proposed transmission line that runs north and south near MP 2, outside of the BLM-designated utility corridor, thus avoiding potential conflicts with the BCCE and Clark County. However, biological resources and species targeted for conservation and protection by these plans, particularly the desert tortoise, would be potentially impacted by the project. However, MM BIO-1 through BIO-18 and MM HAZ-1 would significantly reduce biological impacts by requiring worker training and awareness of specific BCCE BMP policies. Impacts to provisions of the plans would be reduced to less than significant with the incorporation of these measures.

Both the proposed project and Alternative Route B would result in adverse, minor to moderate, localized, short- and long-term impacts to biological resources. ~~Overall, there would be no change in the duration or severity of impacts between the proposed project and the alternative.~~ From a CEQA perspective, Transmission Alternative Route B would result in less than significant impacts with the incorporation of proposed mitigation measures. ~~However, impacts on desert tortoise critical habitat would be significant, adverse, and long term after mitigation because previously undisturbed designated critical habitat would be permanently removed.~~ However, the alternative does not offer significant advantages over the proposed route and impacts would be greater than for the proposed project.

3.4.3.9 Transmission Alternative Route C

Transmission Alternative Route C was suggested by BLM to minimize impacts to Ivanpah Dry Lake by rerouting the transmission line off the existing SCE transmission ROW, just before entering the Ivanpah Dry Lake. The line would head north around the dry lake on a new ROW and would extend a total of 5.3 miles.

Alternative Route C would reduce impacts to the dry lake bed such as crushing of saltscrub vegetation bordering the lake and disturbance to wildlife species using the vegetation and/or the lake bed as habitat. There would also be fewer crossings of intermittent streams with this alternative. However, this alternative would result in a net increase in the extent and magnitude of direct and indirect impacts associated with removal of relatively undisturbed, high quality creosote bush habitat for placement of new towers and creation of new ROW, access roads, and spur roads. Compared with the proposed transmission line route, the proposed project using Alternative Route C would result in an additional 0.7 ~~miles~~ acres of transmission line, which would increase the acreage of permanent and temporary impacts by ~~6.5 acres and 79 acres~~ 4 acres and 80 acres, respectively to the native vegetation community and any wildlife or special-status species that use this habitat.

The increase in the acreage of both permanent and temporary impacts due to creation of new ROW and roads and placement of new towers for Alternative Route C would result in a net increase in the extent and magnitude of potential impacts to biological resources. The increase in spatial extent would increase the potential for disturbing wildlife and increasing wildlife mortality, and would increase the potential for direct or indirect loss of listed or sensitive wildlife and their required habitat. Though no listed or sensitive species were identified along this alternative by the biological surveys, there is the potential for listed or sensitive wildlife species to occur during construction or maintenance due to the presence of suitable habitat. The primary issue for this alternative would be greater impacts to the desert tortoise. Compared with the proposed route, this alternative would cross higher quality desert tortoise habitat, as tortoises do not use the dry lake bed for habitat. Similar to use of Alternative Routes A or B, use of this alternative would result in an increase in both permanent and temporary impacts and increase the potential for direct or indirect loss of desert tortoise and direct loss of tortoise habitat. Alternative Route C does not pass through designated desert tortoise critical habitat as does Alternative A, but previously undisturbed suitable habitat for the species is present.

Transmission Alternative Route C would result in impacts on biological resources (Impacts BIO-1 through BIO-6) on lands that fall under the jurisdiction of the Clark County MSHCP, as the transmission and telecommunication lines cross lands preserved by these plans. Species targeted for conservation and protection by these plans would be potentially impacted by the project.~~The applicant would be required to initiate discussions with Clark County about appropriate fee-based compliance and other mitigation strategies to ameliorate biological impacts, based on the provisions of the MSHCP. Complying with these provisions would eliminate any potential impact to habitat conservation plans from Transmission Alternative Route C.~~ However, MM BIO-1 through BIO-18 and MM LU-1 would significantly reduce biological impacts by requiring compliance coordination with Clark County and Boulder City. Additionally, MM HAZ-1 would further ensure compliance with specific BCCE BMP policies. Impacts to provisions of the plans would be reduced to less than significant with the incorporation of these measures.

Alternative Route C would result in localized short-term and long-term adverse impacts of minor to moderate intensity to biological resources.~~Overall, there would be no difference in the duration or severity of impacts between the proposed project and Alternative Route C. From a CEQA perspective, Transmission Alternative Route C would result in less than significant impacts with the incorporation of mitigation, except for desert tortoise, as impacts to the desert tortoise and its habitat would be significant with this Alternative even after mitigation~~. From a CEQA perspective, Transmission Alternative Route C would result in more impacts even with the incorporation of proposed mitigation measures. Therefore, the alternative does not offer significant advantages over the proposed route and impacts would be greater than for the proposed project.

3.4.3.10 Transmission Alternative Route D and Subalternative E

Transmission Alternative Route D and Subalternative E were suggested by BLM to minimize recreational impacts to the Ivanpah Dry Lake. Where feasible, Routes D and E would parallel structure-for-structure the existing LADWP Marketplace–Adelanto 500-kV transmission line through the Ivanpah Dry Lake. The line would be re-routed west and southwest on a new 130-foot ROW around Ivanpah Dry Lake for approximately 3.3 miles before rejoining the existing ROW at MP 30, Tower 203.

Compared with the proposed project, Routes D and E would reduce impacts to the dry lake bed such as crushing the saltscrub vegetation or disturbing wildlife. However, these routes would result in a net increase in the extent and magnitude of direct and indirect impacts from removal of creosote bush habitat for placement of new towers and creation of new ROW and spur roads. Compared with the proposed transmission line route, these routes would result in an additional ~~0.4 miles~~ 0.2 acres of transmission line, which would increase temporary impacts by 60 acres, and ~~increase~~ decrease permanent impacts by~~1.2 acres~~ 1.3 acres. Overall impacts to native vegetation would increase, as well as the potential for impacts to special-status species. These routes would result in impacts on the pink funnel lily, which was identified during the botanical surveys along Alternative Route D, but is absent from the proposed transmission line route. Numerous jurisdictional drainages or washes were identified within Alternative D and E. However, this alternative would result in fewer crossings of intermittent streams than the proposed project, which would be a decrease in impacts to desert wash habitat and wildlife using this habitat.

The increase in impacts would increase the potential for disturbing wildlife and causing increased wildlife mortality, and would increase the potential for direct or indirect loss of listed or sensitive wildlife and their required habitat. Though no listed or sensitive species were identified along these routes by the biological surveys, there is the potential for listed or sensitive wildlife species to occur during construction or maintenance due to the presence of suitable habitat. Compared with the proposed transmission line route, these routes would cross a slightly greater amount of desert tortoise habitat and therefore would result in a similar potential of impacting desert tortoise.

Transmission Alternative Route D and Subalternative Route E would result in impacts on biological resources (Impacts BIO-1 through BIO-6) on lands that fall under the jurisdiction of the Clark County MSHCP, as the transmission and telecommunication lines cross lands preserved by these plans. Species targeted for conservation and protection by these plans would be potentially impacted by the project.~~The applicant would be required to initiate discussions with Clark County about appropriate fee-based compliance and other mitigation strategies to ameliorate biological impacts, based on the provisions of the MSHCP. Complying with these provisions would eliminate any potential impact to habitat conservation plans from Transmission Alternative Route D and Subalternative Route E.~~

However, MM BIO-1 through BIO-18 and MM LU-1 would significantly reduce biological impacts by requiring compliance coordination with Clark County and Boulder City. Additionally, MM HAZ-1 would further ensure compliance with specific BCCE BMP policies. Impacts to provisions of the plans would be reduced to less than significant with the incorporation of these measures.

Like the proposed project, these routes would result in minor to moderate, localized, short- and long-term adverse impacts to biological resources. ~~Overall, there would be no difference in the duration, severity, or extent of impacts between the proposed project and the proposed project using these routes. From a CEQA perspective, Transmission Alternative Route D and Subalternative E would result in less than significant impacts with the incorporation of mitigation.~~ From a CEQA perspective, Transmission Alternative Route D and Subalternative E would result in similar duration, severity, or extent of impacts even with the incorporation of proposed mitigation measures. Therefore, the alternative does not offer significant advantages over the proposed route and impacts would be greater than for the proposed project.

3.4.3.11 Telecommunication Alternative (Golf Course)

The Golf Course Telecommunication Alternative would consist of aboveground and underground fiber cable extending from the town of Nipton past the Primm Golf Course to the proposed Ivanpah Substation. The Golf Course Telecommunication Alternative would include two 10-mile segments. One 10-mile segment would proceed from the town of Nipton to I-15 (MP 1 to MP 10) along the north side of Nipton Road, parallel to the northern boundary of the Mojave National Preserve. This 10-mile segment would consist of 1 mile of fiber cable installed aboveground on the existing Nipton 33-kV distribution line immediately west of the town of Nipton, on the north side of Nipton Road. Approximately 9 miles of fiber optic cable would be installed in an underground duct on the north side of Nipton Road. A number of poles would also need replacement along this 10-mile segment. The second 10-mile segment would stretch from the I-15 and Nipton Road intersection to Primm Golf Course, and then west across I-15 to the Ivanpah Substation. This segment would also have aboveground and underground cable. Underground ducts would be placed beneath the golf course and at a point approximately 1.0 mile east of the Ivanpah Substation, where a cable would be installed in an underground duct for approximately 1.0 mile to enter the north side of the Ivanpah Substation.

The Golf Course Telecommunication Alternative would result in a net increase in the extent and magnitude of direct and indirect impacts associated with underground installation of cable and retrofitting, replacement, and/or addition of new distribution line poles. Compared with the proposed telecommunication system, the Golf Course Telecommunication Alternative would result in an additional 20 miles of communication line, of which approximately 10 miles would require underground installation. The 9-mile underground duct along Nipton Road would be installed within the road shoulder and require minimal vegetation clearing. However, the additional land disturbances associated with the other underground segments and with pole replacement would result in a total increase in temporary and permanent losses to the native vegetation. There would also be the potential to introduce and further spread invasive and noxious weeds with any new soil disturbances. Additionally, this alternative would impact the sensitive species Borrego milkvetch, which was identified during botanical surveys along the Golf Course Telecommunication Alternative route but was absent from the proposed telecommunication system route. This alternative would impact numerous ephemeral streams and washes, and any associated riparian habitat. While this telecommunication Alternative was not included in the spring 2010 delineation survey, potential jurisdictional waters intersecting the Golf Course Alternative were identified through a review of topographical maps, review of NRCS digital hydrologic unit boundary layer data set and review of high resolution aerial imagery (see Appendix B-5 for the Jurisdictional Delineation Report).

The substantial increase in the acreage of habitat that would be impacted as a result of this alternative would increase the potential for impacts to special-status plants and special-status wildlife, and would increase the potential for the introduction of invasive, non-native, or noxious plant species. In addition to adverse impacts, this alternative could result in beneficial impacts to raptors in the area, compared with the impacts of the proposed project. More perching and nesting posts would be available to raptors with the increase in the number of towers to be installed.

The additional communication line located between the Town of Nipton and I-15 would cross approximately 12.9 miles of designated desert tortoise critical habitat (Ivanpah Unit), approximately 9.8 miles more than the proposed telecommunication route (Table 3.4-8 ~~3.4-6~~). All the disturbance created within this section of this alternative would be permanent in terms of restoration, mitigation, and compensation requirements. Desert tortoise surveys for this alternative found a greater amount of tortoise sign within the Golf Course Telecommunication Alternative than within the proposed project. Additionally, when compared with the proposed project, this alternative would increase potential impacts on desert tortoise due to the significantly increased impacted critical habitat acreage. However, once final density calculations of desert tortoise are available, they should be used to compare this alternative with the proposed project.

The Golf Course Telecommunication Alternative would result in localized, short-term and long-term, adverse impacts, as would the proposed project. ~~Overall, there would be no difference between the duration, severity, or extent of impacts from the proposed project and impacts of this alternative. From a CEQA perspective, the Golf Course Telecommunication Alternative would result in less than significant impacts with the incorporation of proposed mitigation measures. However, impacts on desert tortoise critical habitat would be considered significant, adverse, and long term even after mitigation because previously undisturbed designated critical habitat would be permanently removed.~~ From a CEQA perspective, the Golf Course Telecommunication Alternative would result in a greater amount and extent of impacts even with the incorporation of proposed mitigation measures. Therefore, the alternative does not offer significant advantages over the proposed route and impacts would be greater than for the proposed project.

3.4.3.12 Telecommunication Alternative (Mountain Pass)

The Mountain Pass Telecommunication Alternative would consist of fiber cable that would be located partially aboveground and partially underground from Nipton to Mountain Pass to the Ivanpah Substation. This alternative route would include one 10-mile and one 15-mile segment. The 10-mile segment would be identical to the one described above for the Golf Course Alternative; it would begin at Highway 164 near Nipton and continue to I-15 (MP 1 to MP 10) along the north side of Nipton Road, parallel to the northern boundary of the Mojave National Preserve. The 15-mile segment would begin at I-15 and go to the town of Mountain Pass and then to the Ivanpah Substation. This route would parallel I-15 in an underground duct for approximately 1.0 mile and then continue overhead on the existing Nipton 33-kV distribution line poles west to Mountain Pass and north to the Mountain Pass Substation. From the Mountain Pass Substation, the cable route would turn northeast and proceed on the existing Nipton 33-kV distribution line poles toward the Ivanpah Substation. At the last Nipton line pole, 500 feet of underground conduit would be installed and the cable would enter on the south side of the Ivanpah Substation.

The Mountain Pass Telecommunication Alternative would result in a net increase in the extent and magnitude of direct and indirect impacts associated with underground installation of fiber cable and retrofitting or replacement of distribution line poles. Compared with the proposed telecommunication system, the Mountain Pass Telecommunication Alternative would result in 25 more miles of additional communication line, with 10.5 miles of the line requiring underground installation. Impacts of the 10-mile segment are discussed above for the Golf Course Alternative.

Impacts of the 15-mile segment would include temporary and permanent losses of native vegetation communities, potential loss of special-status plants and wildlife, and potential introduction of noxious weeds. This alternative would cross a more diverse set of vegetation habitat types than the proposed communication line, including Joshua tree woodland and ~~pinion~~ pinyon pine-juniper, thus potentially impacting a more diverse range of plants and wildlife. This alternative would impact three ephemeral drainage features, and any associated riparian habitat. While the Mountain Pass Telecommunication Alternative was not included in the spring 2010 delineation survey, potential jurisdictional waters intersecting the Mountain Pass Alternative were identified through a review of topographical maps, review of NRCS digital hydrologic unit boundary layer data set, and review of high resolution aerial imagery (see Appendix B-5 for the Jurisdictional Delineation Report). Additionally, this alternative would impact numerous sensitive plant species that were identified during the botanical surveys along the Mountain Pass Telecommunication Alternative. The sensitive plant species that occur along this alternative are rough menodora, sky-blue phacelia, *o yphantha* spp., Clark Mountain buckwheat, black grama, Aven Nelson's phacelia, and nine-awned pappus grass. The increase in the acreage of previously undisturbed habitat that would be impacted as a result of this alternative would increase the potential for introduction of invasive, non-native, or noxious plant species. Special-status wildlife would also be impacted by this alternative.

The alternative route would be directly adjacent to special management areas for desert tortoise and bighorn sheep (Clark Mountain ACEC and CDFG Zone 3 for bighorn sheep; Figure 3.4-4). Although the Clark Mountain~~s~~ Range do not provide suitable lambing habitat for desert bighorn sheep, they do provide suitable habitat for foraging. Thus, compared with the California portions of the proposed route which do not pass into the Clark Mountain~~s~~ Range, this alternative is in closer proximity to areas that would provide additional habitat for the sheep. Therefore, greater impacts from human presence and noise could result from this alternative, although these would be minor because the ~~Clark Mountains are~~ Clark Mountain Range is not crucial breeding habitat for the sheep. Increased disturbance impacts to birds could result from this alternative. Montane bird species use the upper elevations of the Clark Mountain~~s~~ Range for foraging and nesting. The Mountain Pass Substation is adjacent to this area; however, the substation and distribution line already exists and thus any additional impacts from construction noise and human disturbance to nearby nesting birds would be temporary and minor. As discussed for the Golf Course Alternative, this alternative could also have some beneficial impacts not provided by the proposed project on raptors in the area, because additional new towers would be installed.

The Mountain Pass Telecommunication Alternative would cross approximately 12.8 miles of designated desert tortoise critical habitat (Ivanpah Unit); a 9.7-mile increase compared with the proposed telecommunication route (Table 3.4-8 ~~3.4-6~~). This would include the same 10-mile segment that is part of both the Mountain Pass and the Golf Course alternative. The Mountain Pass Telecommunication Alternative would impact approximately 0.08 miles less of critical habitat than would the Golf Course Alternative (Table 3.4-8 ~~3.4-6~~). As previously discussed, all of the disturbance created within this 10-mile section would be permanent in terms of restoration, mitigation, and compensation requirements. Desert tortoise surveys for this alternative found more tortoise sign (e.g., scat, tracks, tortoise, burrow, shell) within the Mountain Pass Telecommunication Alternative than within the proposed project. Additionally, when compared with the proposed project, this alternative would increase the potential of impacting desert tortoise due to the significantly increased amount of critical habitat that would be impacted.

Similar to the proposed project, the Mountain Pass Telecommunication Alternative would result in localized, short-term and long-term, adverse impacts of minor to moderate intensity. This alternative's impacts would be of moderate intensity. Also, the Mountain Pass Telecommunication Alternative would result in adverse short-term and long-term impacts of moderate intensity on desert tortoise and its habitat. From a CEQA perspective, the ~~Mountain Pass~~ Golf Course Telecommunication Alternative would result in ~~less than significant~~ a greater amount and extent of impacts even with the incorporation of proposed mitigation measures. ~~However, impacts on desert tortoise critical habitat would be considered significant, adverse, and long term even after implementation of mitigation because previously undisturbed designated critical habitat would be permanently removed.~~ Therefore, the alternative does not offer significant advantages over the proposed route and impacts would be greater than for the proposed project.

3.4.4 Mitigation Measures

The following measures are recommended to minimize, reduce, and mitigate for impacts to biological resources with implementation of the EITP.

MM BIO-1: Preconstruction Surveys. Preconstruction surveys will be conducted by USFWS-approved biologists according to the most current USFWS protocols, where available by species. These surveys will include surveying brush clearing areas and ground disturbance areas within habitat deemed suitable for sensitive species by a qualified biologist. As part of the pre-construction surveys, the composition of the vegetation community will be surveyed to establish baseline conditions prior to construction for post-construction restoration efforts. These surveys will be conducted for the presence of special-status plants, the presence of noxious weeds, and the presence of general and special-status wildlife species, to prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species. For the noxious weeds survey, the level of effort and extent of the surveys will be outlined by the Invasive Plant Management Plan (MM BIO-4).

MM BIO-2: Reclamation Plan. The applicant will develop a Reclamation, Restoration, and Revegetation Plan (RRRP) prior to adoption of the Final EIR/EIS that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. The RRRP will be part of the applicant's final Plan of Development for the project and should address all federal and private land disturbances, including areas where restoration activities have been funded by the Clark County MSHCP and initiated by resource agencies. The RRRP will be developed in consultation with appropriate agencies (BLM, CPUC, CDFG, and Clark County DCP) and be provided to these agencies for review and approval prior to preparation of the Final EIR/EIS. NDOW and the BLM Las Vegas Field Office will be consulted for restoration efforts concerning Nevada State protected cacti and yucca species, which may include preparation of a separate Cactus and Yucca Reclamation Plan. The RRRP will also provide details including but not limited to topsoil segregation and conservation, vegetation treatment and removal, salvage of succulent species, revegetation methods including seed mixes, rates and transplants, and criteria to monitor and evaluate revegetation success. Post-construction monitoring will be performed for 1 to 5 years, depending on the disturbance level and restoration level as outlined in the BLM's 2001 Restoration Plan for Energy Projects in the Las Vegas Field Office.

MM BIO-3: Special-Status Plants Restoration and Compensation. The applicant will mitigate for the loss of special-status plant species within the project area ~~immediately~~ following ~~construction~~ the completion of all construction activities at a particular site and within 1 year of post-construction according to the requirements of resource agency authorizations (e.g., CDFG 2081 permit). Special-status plants will be restored by relocation of plants and/or re-seeding, replacing topsoil with existing topsoil that was removed, and re-grading to pre-existing soil contours. Measures to restore special-status plants will be implemented through the Reclamation Plan (MM BIO-2). Additionally, that plan will provide a matrix showing how the applicant will address each species considered sensitive or special-status in terms of mitigation type (e.g., seed collection, transplanting, fencing certain population, and compensation measures). The CDFG will likely require land compensation and enhancement and endowment fees for the project in addition to restoration. If special-status plant communities cannot be restored, the applicant will provide compensation if required, in consultation with appropriate agencies (USFWS, BLM, CDFG, NDOW, and CPUC). In order to ensure enforceability, documentation of consultations with all appropriate agencies will be provided to the CPUC (the CEQA lead agency).

MM BIO-4: Model Invasive Plant Management Plan on the BLM Las Vegas Office DRAFT Weed Plan. The Invasive Plant Management Plan to be developed (APM BIO-10) will be modeled on the BLM Las Vegas Office DRAFT Weed Plan. The plan will include operation and maintenance activities, as well as construction activities. The content of the plan will include results of the noxious weed inventory, identification of problem areas, preventative measures, treatment methods, agency-specific requirements, monitoring requirements, and herbicide treatment protocol. The plan will include best management practices that require that any biological material brought on-site (e.g., hay bales that may be used for controlling stormwater under APM GEO-2, and native mixes for vegetation in MM BIO-2) will be certified weed-free. The plan will be submitted to both the California and the Nevada resource agencies and to the CPUC for approval prior to construction authorization.

MM BIO-5: Jurisdictional Delineation. Conduct a formal jurisdictional delineation within the boundaries of the project area once final engineering for the location of project-specific features is complete. This will be conducted prior to construction and is required in order to apply for permits, if needed, with USACE, California RWQCBs, and CDFG. A copy of the jurisdictional delineation will be provided to the CPUC.

MM BIO-6: Drainage Crossings Design. If drainages cannot be avoided by infrastructure placement, then the applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.

MM BIO-7: Mitigation Monitoring Plan for Affected Jurisdictional Areas. The applicant will develop a Mitigation Monitoring Plan for affected jurisdictional areas within established riparian areas, as needed, for submittal to the USACE for review and approval. The plan will outline measures to accomplish restoration, provide criteria for restoration success, and/or provide compensation ratios. This measure is needed to compensate for loss of ~~wetlands and~~ waters and riparian vegetation that provide suitable habitat for special-status and sensitive species, and provide important hydrological and water quality functions in the desert environment. Monitoring and reporting, likely for up to 3 to 5 years post-construction, will be required, pending consultation with agencies. A copy of the approved Mitigation Monitoring Plan will be provided to the CPUC and CDFG.

MM BIO-8: Reduce Night Lighting. Night lighting will be reduced in all natural areas to avoid unnecessary visual disturbance to wildlife. Night lighting during construction, operations, and maintenance will be reduced in natural areas using directed lighting, shielding methods, and/or reduced lumen intensity. The applicant will indicate anticipated measures to resource agencies for approval prior to construction. The approved measures will be provided to the CPUC.

MM BIO-9: Cover Steep-walled Trenches or Excavations during Construction. To prevent entrapment of wildlife, all steep-walled trenches, auger holes, or other excavations will be covered at the end of each day. Fencing will be maintained around the covered excavations at night. For open trenches, earthen escape ramps will be maintained at intervals of no greater than 0.25 miles. A biological monitor will inspect all trenches, auger holes, or other excavations a minimum of twice per day during non-summer months and a minimum of three times per day during the summer (hotter) months, and also immediately prior to back-filling. Any wildlife species found will be safely removed and relocated out of harm's way, using suitable tools such as a pool net when applicable. For safety reasons, biological monitors will under no circumstance enter open excavations.

MM BIO-10: Biological Monitors. Biological monitors will be provided throughout construction activities in all construction zones with the potential for presence of sensitive biological resources. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use.

MM BIO-11: Water Usage. Water used for fugitive dust control will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

MM BIO-12: Desert Tortoise Impacts Reduction Measures. To reduce impacts on desert tortoise, the following will be done:

- The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. ~~Additionally, compliance discussions with Clark County and Boulder City must occur prior to construction that resolve and outline the specific compensation fees or additional mitigation measures needed for loss of desert tortoise habitat.~~ A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC and the Clark County Desert Conservation Program.
- Construction monitoring will employ a designated field contact representative, authorized biologist(s), and qualified biologist(s) approved by the USFWS, NDOW, and CDFG during the construction phase of the project. BLM will recommend qualified, authorized biologists to the USFWS and will approve all biological monitors.

- Qualified and/or authorized biologists will monitor all construction activities year-round in desert tortoise habitat, regardless of the time of year or weather conditions, as tortoises are often active outside their "active" season.
- ~~Authorized~~ Qualified and/or authorized biologists will conduct preconstruction surveys according to the most current USFWS protocol.
- Authorized biologists will handle desert tortoises following the most current Desert Tortoise Council handling guidelines (~~1999~~ 2009 or newer).
- Prior to commencing desert tortoise relocation activities, authorization will be obtained from NDOW, CDFG, and USFWS. The authorized biologist will not be required to receive approval to move individual desert tortoises during construction.
- Desert tortoise relocations will only occur from an active construction zone to an area that is not under active construction by the EITP project or any other planned project.
- Biological monitors will clear ahead of construction crews in desert tortoise habitat during all clearing and grading activities, or during any activity where undisturbed vegetation would be crushed. In addition, biological monitors will clear ahead of larger, non-rubber-tired equipment when that equipment is being driven on access and spur roads.
- Biological monitors will clear all active work sites located in desert tortoise habitat each morning before construction begins and throughout the day if crews move from ~~tower~~ construction site to construction site.
- Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the CFR on a weekly basis (at minimum). The authorized biologist will notify the CFR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed.
- ~~For California portions of the project, in addition to adhering to the most current Desert Tortoise Council handling guidelines, the following guidelines will be adhered to:~~
- No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95 degrees Fahrenheit (35 degrees Celsius). No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95 degrees Fahrenheit before handling or processing can be completed. If the ambient air temperature exceeds 95 degrees Fahrenheit during handling or processing, desert tortoises shall be kept shaded in an environment which does not exceed 95 degrees Fahrenheit, and the animals shall not be released until ambient air temperature declines to below 95 degrees Fahrenheit. For ~~translocation~~ relocation, captured tortoises may be held overnight and moved the following morning within these temperature constraints.
- During all handling procedures, desert tortoises must be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (e.g., gaping, foaming at the mouth, hyperactivity, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises must be kept shaded at all times until it is safe to release them. Ambient air temperature must be measured in the shade, protected from wind, and at a height of 2 inches above the ground surface.
- If a desert tortoise voids its bladder as a result of being handled, the animal shall be rehydrated. The process of rehydrating a desert tortoise will take place at the location where the animal was captured (or to be released, for translocated tortoises), and consist of placing the desert tortoise in a tub with a clean plastic disposable liner. The amount of water that is placed in the lined tub shall not be higher than the lower jaw of the animal. Each desert tortoise shall be rehydrated for a minimum of 10 to 20 minutes. During the period

when the desert tortoise is in the tub, the tub will be placed in a quiet protected area. Desert tortoises shall be soaked individually.

- If a desert tortoise is injured as a result of project-related activities, it shall be immediately taken to a CDFG-approved wildlife rehabilitation or veterinary facility. The applicant shall identify the facility prior to the start of ground- or vegetation-disturbing activities. The applicant shall bear any costs associated with the care or treatment of such injured covered species. The applicant shall notify CDFG of the injury immediately unless the incident occurs outside of normal business hours. In that event CDFG shall be notified no later than noon on the next business day. Notification to CDFG shall be via telephone or email, followed by a written incident report. Notification shall include the date, time, location, and circumstances of the incident, and the name of the facility where the animal was taken.
- The applicant will produce a Raven Management Plan that is acceptable to the BLM and the CPUC. Details in the plan will include information on procedures, frequency, and recommended season for conducting raven nest surveys, procedures and responsibilities for raven nest removal, USFWS/NDOW/CDFG authorization and/or permitting requirements for conducting raven control, and compensation measures for raven reduction programs in California and Nevada. The plan will be submitted to the BLM and the CPUC at least 60 days prior to construction for review and approval.

MM BIO-13: Desert Bighorn Sheep Impacts Reduction Measures. To reduce impacts on desert bighorn sheep, the following will be done:

- Conduct preconstruction survey for desert bighorn sheep within suitable bighorn sheep habitat within 1 week prior to construction activities in the McCullough ~~Mountains~~ Range, Clark Mountain Range, and the southern portion of the Eldorado Valley between the Highland Range and the Southern McCullough ~~Mountains~~ Range. The occurrence and location of any desert bighorn sheep will be reported to NDOW for sightings in Nevada and reported to CDFG for sightings in California.
- Conduct biological monitoring by a qualified biologist for desert bighorn sheep during duration of construction within suitable bighorn sheep habitat. The occurrence and location of any desert bighorn sheep will be reported to NDOW for sightings in Nevada and reported to CDFG for sightings in California. If bighorn are found to be within 500 feet of construction activities, construction in that area will be stopped until the sheep vacate the project area.
- Avoid all construction activities (with the exception of vehicle use of access roads during emergencies) in lambing areas from January to May in the North McCullough Pass area (approximately MP 9 to MP 12) during the duration of construction and all maintenance events.

MM BIO-14: American Badger Impacts Reduction Measures. To reduce impacts to American badger, the following will be done:

- Qualified biologists will be notified if badgers are observed within the project area during construction activities. Work will immediately be stopped in the area if the biologists find occupied burrows within 100 feet of construction activities during preconstruction surveys.
- Qualified biologists will ensure passive relocation of the occupied burrow by installing one-way trap doors on the burrow. The burrow will be collapsed after the badger vacates.
- During the spring months when young may be present in burrows, burrows must be checked for young before the installation of the one-way trap door. If young are present during relocation efforts, all work will stop within 100 ft of the burrow until the young have left the burrows within the project area.
- Work will be allowed to resume once the ~~burrow~~ badger has relocated outside the 100-foot zone.

MM BIO-15: Migratory Birds and Raptors Impacts Reduction Measures. To reduce impacts on migratory birds and raptors, the following will be done:

- Biological monitors will monitor and enforce disturbance buffers around all active bird nests (for raptors and species protected by the MBTA) found in project areas during construction. The general bird breeding season for this area is late February to early July. For raptors specifically, the applicant will use the USFWS Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (1999) to determine appropriate survey areas and disturbance buffers for active nests, except for burrowing owl nests, for which the applicant will be in compliance with the minimum distances outlined by the California Burrowing Owl Consortium Protocol. For all non-raptor bird species, biologists will survey within project areas. Because there are no standardized disturbance buffers for active non-raptor bird nests, SCE will consult with the appropriate agencies (BLM, USFWS, CDFG, and NDOW) on a case-by-case basis when active nests are found in project areas, unless directed to do otherwise by these same agencies.
- Active bird nests will not be moved during breeding season, unless the project is expressly permitted to do so by the USFWS, BLM, CDFG, or NDOW depending on the location of the nest.
- All active nests and disturbance or harm to active nests will be reported within 24 hours to the USFWS, BLM, CDFG, and NDOW upon detection.
- The biological monitor will halt work if it is determined that active nests would be disturbed by construction activities, until further direction or approval to work is obtained from the appropriate agencies.
- Seasonal work stoppages may be required by NDOW for project areas that pass the Wee Thump Joshua Tree Wilderness if construction activities occur within the breeding season. The applicant will consult with NDOW prior to construction.
- As outlined by the *ggeste a ti es fo ian ote tion on o e ines* (APLIC 2006), the following avian safe practices will be employed during construction: cover phase conductors with manufactured covers, include perch discouragers on crossarms and on top of poles, exceed the minimal distance between phase conductors to prevent electrocution by perched birds and their wingspan, utilize longer horizontal insulators, suspend phase conductors on pole top and cross arms, install horizontal jumper support to increase the phase-to-ground separation, replace tension members with fiberglass or non-conducting materials, cover tension members with dielectric material, utilize fiberglass poles or switches, and install standard nest discouragers.

MM BIO-16: Burrowing Owl Impacts Reduction Measures. To reduce impacts on burrowing owl, the following will be done:

- A qualified biologist will conduct preconstruction surveys within 30 days prior to construction for burrowing owl within suitable habitat prior to breeding season (February 1 through August 31). All areas within 50 m (approximately 150 feet) of the project area will be surveyed.
- If an active nest is identified, there will be no construction activities within 50 m (approximately 150 feet) of the nest location to prevent disturbance until the chicks have fledged, as determined by a qualified biologist.
- The occurrence and location of any burrowing owl will be documented by biological monitors in daily reports and submitted to the authorized biologist on a daily basis. The authorized biologist will report all incidents of disturbance or harm to burrowing owls within 24 hours to the appropriate resource agencies (USFWS, BLM, NDOW, CDFG).

If burrowing owls are found on site in the California portion of the project, the following additional measures will be included:

1) As compensation for the direct loss of burrowing owl nesting and foraging habitat, the project proponent shall mitigate by acquiring and permanently protecting known burrowing owl nesting and foraging habitat at the following ratio:

(a) Replacement of occupied habitat with suitable habitat at 1.5 x 6.5 acres per pair or single bird;

(b) Replacement of occupied habitat with habitat contiguous with occupied habitat at 2 x 6.5 acres per pair or single bird; and/or

(c) Replacement of occupied habitat with suitable unoccupied habitat at 3 x 6.5 acres per pair or single bird.

2) A Burrowing Owl Mitigation and Monitoring Plan shall be submitted to CDFG for review and approval prior to relocation of owls. The Burrowing Owl Mitigation and Monitoring Plan shall describe proposed relocation and monitoring plans. The plan shall include the number and location of occupied burrow sites and details on adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation of artificial burrows (numbers, location, and type of burrows) shall also be included in the plan. The plan shall also describe proposed off site areas to preserve to compensate for impacts to burrowing owls/occupied burrows at the project site as required under Condition 1. A copy of the approved plan will be provided to the CPUC.

MM BIO-17: Gila Monster Compliance. The most current NDOW construction site protocols for the Gila monster (NDOW 2007) will be followed by the applicant in both Nevada and California portions of the project. To reduce impacts on Gila monster, all locations of Gila monster found within the project area during surveys and construction work will be reported to NDOW and the CDFG.

MM BIO-18: Avian Protection Plan. To reduce impacts on golden eagles and raptors, the applicant shall submit an Avian Protection Plan for approval to the BLM within 6 months of the issuance of any ROW grant for the project. The Plan shall be prepared according to guidance provided by the USFWS (USFWS 2010).The Avian Protection Plan must be implemented within one year from the date of any ROW grant Notice to Proceed.

3.4.5 Whole of the Action / Cumulative Action

~~Below is a brief summary of information related to biological resources in the ISEGS FSA/DEIS prepared by the CEC and the BLM. This section focuses on differences in the ISEGS setting and methodology compared with the setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the CEC for ISEGS.~~

Below is a brief summary of information related to biological resources in the BLM's ISEGS Final Environmental Impact Statement (FEIS) and the California Energy Commission's (CEC's) Final Staff Assessment (FSA), Addendum, and Final Decision. This section focuses on differences in the ISEGS setting and methodology compared with the setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the BLM and CEC for ISEGS.

3.4.5.1 ISEGS Setting

Overall

The setting of the ISEGS is very similar to the Ivanpah Substation area as described in Section 3.4.1, "Environmental Setting." The ISEGS project is located wholly in California on undisturbed, natural land. This area is surrounded by both undisturbed and developed land, including the Primm Valley Golf Course, I-15, ~~an~~ existing transmission lines, and unpaved roads.

Drainages and Waters of the State

~~Although an~~An assessment of ephemeral and intermittent drainages and Waters of the State (including jurisdictional determination by federal and state agencies) ~~has not been completed~~ was conducted for the EITP~~, the~~ in spring 2010. The general characteristics of the drainages within the EITP area are similar in form and function to those in the ISEGS area. The ISEGS project is sited on a broad bajada that extends from the base of the Clark Mountains Range to the western edge of Ivanpah Dry Lake. Approximately 2,000 ephemeral washes, which form part of the regional bajada, occur throughout the project area. Within the ISEGS area, the drainages range from small (1 to 4 feet wide) to large (greater than 85 feet). A total of 291 miles of channels cover 198.72 acres. Most of the drainages are small. Based on initial delineations, no wetlands or riparian areas are within the ISEGS project area. The USACE determined that the ISEGS would not discharge dredged or fill material into a Water of the United States or an adjacent wetland, and therefore would not be subject to jurisdiction under Section 404 of the Clean Water Act. However, all of the ephemeral and intermittent drainages are considered Waters of the State of California.

Wildlife

ISEGS supports a wildlife community (reptiles, mammals, and birds) similar to that of the EITP, as well as special-status wildlife species. Table 3.4-9 lists the special-status wildlife species that are known to occur or have the potential to occur within the ISEGS project area. All of the species in Table 3.4-9 were determined to occur or had the potential to occur within the EITP in California (Table 3.4-5) with the exception of the following species: Vaux's swift, gray-headed junco, hepatic tanager, summer tanager, Brewer's sparrow, Bendire's thrasher, Virginia's warbler, and gray vireo.

Vegetation

Compared with the entire EITP project, the ISEGS project is characterized by fewer habitat types because it covers less area and less topography changes. However, because the EITP (for example, the Ivanpah Substation in California) is in the same general geographical location as ISEGS, habitat types are similar for the two projects. Within the ISEGS project area, the dominant habitat is Mojave creosote brush scrub, with small amounts of Mojave yucca-Nevada ephedra scrub and Mojave wash. Overall, the plant community is characterized by a high density and diversity of native succulents and low levels of noxious weeds. The eight species of invasive/noxious weeds that were detected within the ISEGS project area were all found within the EITP area as well. Table 3.4-9 lists the special-status plant species that are known to occur or have the potential to occur within the ISEGS project area. Species in bold in Table 3.4-9 are those that were observed within the ISEGS project area. Out of the 12 special-status plant species that were observed within the ISEGS project area, Clark Mountain agave (*ga e tahensis* var. *ne a ensis* , Utah mortonia (*o tonia tahensis* , cave evening-primrose (*enothe a a e nae* , and desert portulaca (*o t la a hali oi es*) were not observed during EITP surveys or were determined to be unlikely to occur within the EITP area in California (Table 3.4-5).

Table 3.4-9 Special-Status Species Known or Potentially Occurring in the ISEGS Project Area and Vicinity

Common Name	Scientific Name	Status Fed/State/BLM/CNPS
PLANTS		
Mormon needle grass	*hnathe a i*	__/__/__/2.3
Clark Mountain agave*	*Aga e tahens s* **var.** *ne a ens s*	**__/__/__/4.2**
Desert ageratina	*ge atina he ba ea*	__/__/__/2.3
Coyote gilia	*li iella t io on*	__/__/__/2.2
Small-flowered androstephium	*An r ste h re l r*	**__/__/__/2.23**
White bear poppy	*to e on e ia ii*	__/__/__/2.2
Mojave milkweed	*Ascle as nyctag n l a*	**__/__/__/2.1**
Cima milk-vetch	*st agal s i ae* var. *i ae*	__/__/__/1B.2
Providence Mountain milk-vetch	*st agal s n tans*	__/__/__/4.2
Scaly cloak fern	*st olepis o hisensis* ssp. *o hisensis*	__/__/__/2.3
Black grama	*o telo a e iopo a*	__/__/__/4.2
Red grama	*o telo a t ifi a*	__/__/__/2.3
Alkali mariposa lily	*alo ho t s st iat s*	__/__/__/1 B.2

Table 3.4-9 Special-Status Species Known or Potentially Occurring in the ISEGS Project Area and Vicinity

Common Name	Scientific Name	Status Fed/State/BLM/CNPS
Purple bird's-beak	*o ylanth s pa iflo s*	__/__/__/2.3
Desert pincushion	*ry hantha chl rantha*	**__/__/__/2.1**
Viviparous foxtail cactus*	*ry hantha ara* **var.** *r sea*	**__/__/__/2.2**
Winged cryptantha	*yptantha holopte a*	__/__/__/4.3
Gilman's cymopterus	*y opte s gil anii*	__/__/__/2.3
Utah vine milkweed	*ynanch tahense*	**__/__/__/4.2**
Naked-stemmed daisy	*n eliopsis n i a lis* var. *n i a lis*	__/__/__/4.3
Nine-awned pappus grass	*nnea g n es a*	**__/__/__/2.2**
Limestone daisy	*ige on n ialis* var. *n ialis*	__/__/__/1B.2
Forked buckwheat	*iogon bif at*	__/__/__/1B.2
Hairy erioneuron	*ione on pios*	__/__/__/2.3
Clark Mountain spurge	*pho bia e stip lata* var. *e stip lata*	__/__/__/2.1
Wright's bedstraw	*ali ightii*	__/__/__/2.3
Pungent glossopetalon	*lossopetalon p ngens*	__/__/__/1B.2
Parish club-cholla	*r s n a ar sh*	**__/__/__/2.2**
Hairy-podded fine-leaf hymenopappus	*y enopapp s filifoli s* var. *e iopo s*	__/__/__/2.3
Jaeger's ivesia	*esia aege i*	__/__/__/1B.3
Knotted rush	*n s no os s*	__/__/__/2.3
Hillside wheat grass	*ey s salin s* ssp. *o a ensis*	__/__/__/2.3
Plains flax	*in p be l*	__/__/__/2.3
Spearleaf	*atelea pa ifolia*	__/__/__/2.3
Rough menodora	*eno o a s ab a*	__/__/__/2.3
Polished blazing star	*ent elia polita*	__/__/__/1B.2
Utah mortonia*	*rt n a tahens s*	**__/__/__/4.3**
Tough muhly	*hlenbe gia a senei*	__/__/__/2.3
Crowned muilla	*illa o onata*	__/__/__/4.2
False buffalo-grass	*n oa s a osa*	__/__/__/2.2
Cave evening primrose*	*Oen thera ca ernae*	**__/__/__/2.1**
Short-joint beavertail	*p ntia basila is* var. *b a hy la a*	__/__/__/1B.2
Curved-spine beavertail	*p ntia ispina*	__/__/__/2.2
Spiny cliff-brake	*ellaea t n ata*	__/__/__/2.3
White-margined beardtongue	*enste on albo a ginat s*	__/__/__/1B.2
Rosy two-toned beardtongue	*enste on bi olo* ssp. *ose s*	__/__/__/2.3
Limestone beardtongue	*enste on al a eo s*	__/__/__/1B.3
Death Valley beardtongue	*enste on f ti ifo is* var. *a a gosae*	__/__/__/1B.3
Stephen's beardtongue	*enste on stephensii*	__/__/__/1B.3
Thompson's beardtongue	*enste on tho psoniae*	__/__/__/2.3
Utah beardtongue	*enste on tahensis*	__/__/__/2.3
Aven Nelson's phacelia	*ha elia anelsonii*	__/__/__/2.3
Barneby's phacelia	*ha elia ba nebyana*	__/__/__/2.3
Sky-blue phacelia	*ha elia oe lea*	__/__/__/2.3
Parish's phacelia	*ha elia pa ishii*	__/__/__/1B.1
Jaeger's phacelia	*ha elia pe ityloi es* var. *aege i*	__/__/__/1B.3
Chambers' physaria	*hysa ia ha be sii*	__/__/__/2.3
Small-flowered rice grass	*iptathe i anth*	__/__/__/2.3

Table 3.4-9 Special-Status Species Known or Potentially Occurring in the ISEGS Project Area and Vicinity

Common Name	Scientific Name	Status Fed/State/BLM/CNPS
Desert portulaca	*P rt laca hal es*	**__/__/__/4.3**
Abert's sanvitalia	*an italia abe tii*	__/__/__/2.2
Many-flowered schkuhria	*hk h ia ltiflo a* var. *ltiflo a*	__/__/__/2.3
Johnson's bee-hive cactus	*le o a t s ohnsonii*	__/__/__/2.2
Mojave spike-moss	*elaginella le ob yoi es*	__/__/__/4.3
Rusby's desert-mallow	*haeralcea r s y* **var.** *ere c la*	**__/__/S/1B.2**
WILDLIFE		
Reptiles		
Desert tortoise	*her s agass*	**FT/ST/__**
Banded gila monster	*elo e a s spe t in t*	SC/__/S
Birds		
Burrowing owl	*Athene c n c lar a*	**FSC/CSC/__**
Golden eagle	*A la chrysaet s*	**FSC/ CSC, FP /S**
Vaux's swift	*haet ra a*	**FSC/__/__**
Gray-headed junco	*n o hye alis ani eps*	FSC/WL/__
Loggerhead shrike	*an s l c an s*	**FSC/CSC/__**
Hepatic tanager	*i anga fla a*	FSC/WL/__
Summer tanager	*i anga b a*	__/CSC/__
Brewer's sparrow	*ella re er*	**BCC/__/__**
Bendire's thrasher	*To osto a ben i ei*	BCC/CSC/S
Crissal thrasher	*st a cr ssale*	**BCC/CSC/__**
Le Conte's thrasher	*st a lec nte*	**BSS/WL/__**
Virginia's warbler	*e i o a i giniae*	BCC/WL/__
Gray vireo	*i eo i inio*	BCC/CSC/S
Mammals		
Townsend's big-eared bat	*o yno hin s to nsen ii*	__/CSC/S
Pallid bat	*nt o o s palli s*	__/CSC/S
Long-legged myotis	*yotis olans*	__/__/S
Nelson's bighorn sheep	*is ana ensis nelsoni*	__/~~—~~FPS/S
American badger	*a ea ta s*	**__/CSC/__**

Sources: CNDDB 2009 (Ivanpah Dry Lake, State Line Pass, Mesquite Lake, Clark Mountain, Mescal Range, Mineral Hill, Nipton, and Desert USGS quads)
Plants: CNPS 2009, CDFG 2009
Animals: CDFG Special Animals List

Notes:
Bold-face-type denotes species that were observed on or near the proposed project site, or plants observed within a 1-mile buffer of the ISEGS site during the 2007/08 field surveys.
*Found in buffer area surveys only.

Key:
CNPS = California Native Plant Society

Status Codes

BCC = Birds of Conservation Concern (Fish and Wildlife Service); identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that are highest conservation priorities (www.fws.gov/migratorybirds/reports/BCC2002.pdf)

BLM = Bureau of Land Management Sensitive; BLM Manual Section 6840 defines sensitive species as "... those species that are (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats." <www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitiveAnimals.pdf>

FPS = State of California Fully Protected Species

CSC = California Species of Special Concern; species of concern to CDFG because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction

Table 3.4-9 Special-Status Species Known or Potentially Occurring in the ISEGS Project Area and Vicinity

Common Name	Scientific Name	Status Fed/State/BLM/CNPS

FE = Federally listed endangered; species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened; species likely to become endangered within the foreseeable future

State
SE = State listed as endangered
ST = State listed as threatened
WL = State watch list

California Native Plant Society
1B = Rare, threatened, or endangered in California and elsewhere
2 = Rare, threatened, or endangered in California but more common elsewhere
3 = Plants for which more information is needed
4 = Limited distribution – a watch list
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)
0.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

Applicable Laws, Regulations, and Standards

Due to the similarity of the desert biological resources that would be impacted by the EITP and ISEGS project and the geographical location of both projects, the same laws, regulations, and standards would apply to ISEGS as those listed in the appropriate subsections of Section 3.4.2 for EITP. Since ISEGS would be developed entirely within California on BLM land, the Nevada regulations associated with the EITP would not apply to ISEGS.

3.4.5.2 ISEGS Methodology

CEC's FSA Methodology

In the ISEGS FSA/DEIS, ~~BLM~~ FSA Addendum, and the Final Decision, CEC staff reported on existing conditions and assessed impacts to ~~soil and water~~ biological resources. They evaluated the potential for the project to cause direct and indirect impacts to biological resources and considered compliance with the laws, ordinances, regulations, and standards associated with the project components and location. They also considered whether there would be a significant impact under CEQA using the following impact criteria:

- Would the project impact special-status species, such as state- or federally listed species, state fully protected species, candidates for state or federal listing, and/or species of special concern?
- Would the project interrupt species migration; result in reduction of native fish, wildlife, and plant habitat; or cause a fish or wildlife population to drop below self-sustaining levels?
- Would the project disturb wetlands, marshes, riparian areas, or other wildlife habitat?
- Would the project harass a protected species, even if it did not result in the loss of habitat or reduction in population numbers?

BLM's FEIS Methodology

Under NEPA, the BLM's FEIS assessed the significance of ISEGS's impact on biological resources against NEPA-implementing regulations at 40 CFR 1508.27 (see Section 3.12.3.1). Specifically, the BLM's FEIS evaluated whether the ISEGS project would result in impacts related to the following (BLM 2010):

- Impact analyses typically characterize effects to plant communities as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-project state. In the Mojave Desert ecosystem the definition of permanent impacts needs to reflect the slow recovery rates of its plant communities. Natural recovery rates from disturbance in these systems depend on the nature and severity of the impact. For example, severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years; complete ecosystem recovery may require over 3,000 years. In this analysis, an impact is considered temporary only if there is evidence to indicate that pre-disturbance levels of biomass, cover, density, community structure, and soil characteristics could be achieved within five years. Acreages provided below for impacts are considered permanent unless noted otherwise.

3.4.5.3 ISEGS Impacts

The CEC and BLM ~~and CEC~~ staff determined that construction, operation, and decommissioning of the ISEGS project could impact biological resources, particularly on special-status plant species. Where impacts were identified, ~~they~~ the CEC and BLM staff proposed mitigation measures to reduce impacts to less than significant levels.

The CEC and BLM have published the impacts discussed below related ~~to the~~ biological resources ~~for the ISEGS project. Section 3.4.5.4 contains the CEC- and BLM-proposed mitigation measures~~ for the ISEGS project.

~~Construction Impacts~~

CEC's FSA/DEIS / FSA Addendum / Final Decision Impact Conclusions

CEC staff determined that construction, operation, and decommissioning of the ISEGS project could impact biological resources. Where impacts were identified, they proposed Conditions of Certification/ mitigation measures to reduce impacts to less than significant levels.

The CEC has published the following impacts in the FSA/DEIS, FSA Addendum, and the Final Decision related to the biological resources for the ISEGS project. Section 3.4.5.4 contains the CEC- proposed Conditions of Certification mitigation measures for the ISEGS project.

The constructed ISEGS project would permanently impact ~~3,712.7 acres~~ 3,297 acres and temporarily impact ~~321.0 acres~~ 241.6 acres.

The construction of the ISEGS project would change the structure and species composition of the native vegetation community due to clearing and mowing the vegetation. Construction activities would result in conditions that would favor more disturbance-tolerant species and the site would be more vulnerable to invasive/noxious weed species. ~~BLM and~~ CEC staff determined that the direct and indirect impacts to the native vegetation community from construction would be significant.

Construction would directly impact eight special-status plant species, and the impact to ~~five~~ six of these species (small-flowered androstephium, Mojave milkweed, desert pincushion, nine-awed pappus grass, Parish's club cholla, and Rusby's desert-mallow) would be significant. The impact to the remaining ~~three~~ two special-status species (~~small-flowered androstephium,~~ Utah vine milkweed~~,~~ and desert portulaca) would be less than significant. To avoid impacts to special-status plant species, ~~BLM and~~ CEC staff concluded in the ISEGS FSA/DEIS that the ~~ISEGS~~ project's layout should be reconfigured to avoid areas that support the highest density and diversity of these plant species. The applicant filed its Biological Mitigation Proposal ("Mitigated Ivanpah 3") on February 11, 2010, which designates three areas that would be removed from the project footprint. The Biological Mitigation Proposal reduces the total project area by 476 acres with much of the acreage containing individuals of the special-status plant species of concern (Mojave milkweed, desert pincushion, nine-awed pappus grass, Parish's club cholla, and Rusby's desert-mallow). Considering the level of complete avoidance and on-site minimization that would be accomplished for special-status plants as proposed in the Mitigated Ivanpah 3 Alternative, CEC staff has concluded that implementation of staff's proposed Condition of Certification BIO-18 is needed to complement the applicant's proposal and reduce impacts to special-status plant species to less-than-significant levels if the protection goals and other mitigation measures described above are to be achieved. The Final Decision refers to this staff recommendation; however, it is uncertain whether potentially significant impacts to two of the special-status plant species located on the project site but not in one of the protected areas will be mitigated to insignificant levels. Therefore, the CEC may find the project may have a significant impact on Mojave milkweed and desert pincushion due to the loss of a portion of their habitat.

Construction traffic would result in increased wind-caused erosion of the soil, which could result in degradation and loss of plants by burial and abrasion and interruption of the natural processes of nutrient accumulation, and could allow the loss of soil resources.

Vegetation clearing and grading associated with ISEGS construction would directly affect wildlife by removal and crushing of shrubs and herbaceous vegetation, resulting in loss and fragmentation of cover, breeding, and foraging habitat for wildlife.

Construction would eliminate nesting habitat as well as directly impact nests, eggs, and young of migratory/special-status birds. With implementation of the Conditions of Certification (BIO-11, BIO-15, BIO-16, BIO-17), the impacts to migratory and sensitive species birds would be less than significant.

Construction would result in the loss of American badger foraging and denning habitat and would fragment and reduce the quality of the foraging and denning habitat adjacent to the ISEGS project. ~~BLM and~~ CEC staff concluded that this loss of foraging and denning habitat would be a substantial contributor to the cumulative loss of the Ivanpah Valley's American badger population. Construction could also crush or entomb individuals, resulting in their injury or death. The ISEGS FSA/DEIS concluded that through implementation of Condition of Certification BIO-17, the impact to the American badger would be reduced to less than significant.

The construction of the ISEGS project would reduce the availability of seasonal foraging habitat and impact the movement corridors of Nelson's bighorn sheep. Through implementation of BMPs and creation of a water source (Condition of Certification BIO-19) in the eastern Clark Mountains or in the State Line Hills, the ISEGS FSA/DEIS concluded that impact to Nelson's bighorn sheep would be less than significant.

Construction could result in the loss of habitat and the direct mortality of the banded Gila monster. Though no banded Gila monsters were observed during the biological surveys, suitable habitat is present within the ISEGS project area, and therefore Gila monsters were assumed to be present. Condition of Certification BIO-11 requires that concurrent with the desert tortoise clearance survey, a biologist perform a preconstruction survey for Gila monsters in the project area, and implement appropriate impact avoidance and minimization measures if detected. The ISEGS FSA/DEIS concluded that with the implementation of BMPs and the compensatory mitigation ~~for desert tortoise~~ stated in BIO-17 and BIO-19, the impact to banded Gila monster would be less than significant.

Construction would result in the loss of approximately ~~4,073 acres~~ 3,582+ acres of desert tortoise habitat and the applicant would therefore be required to translocate at least 25 desert tortoise individuals. The translocation process would result in reduced survivorship for the translocated individuals. The construction of the ISEGS would create fragmentation and loss of connectivity within the surrounding desert tortoise habitat due to the fencing surrounding the perimeter of the project area. The increased road traffic due to construction would also increase the road kill hazard to desert tortoise. Construction would also increase raven and coyote presence and would increase desert tortoise predation levels. The ISEGS FSA/DEIS concluded that even with implementation of the recommended mitigation measures, impacts to desert tortoise would be significant.

Construction would impact ~~198 acres~~ 175 acres of ephemeral drainages within the ISEGS project area. Minimizing impacts to the drainages during construction activities and providing offsite in-kind compensation (the applicant would acquire and enhance property that contained ~~198 acres~~ 175 acres of ephemeral drainages similar to the ISEGS project) would make impacts to the ISEGS project area's ephemeral drainages less than significant, according to the ISEGS FSA/DEIS conclusions.

Noise from construction activities could temporarily impact wildlife immediately adjacent to the ISEGS project by reducing the foraging and nesting behavior. However, the increased noise would be short in duration and proper mitigation would be implemented to further reduce any detrimental impact to the adjacent wildlife. The ISEGS FSA/ DEIS concluded that the increased noise levels at the perimeter of the ISEGS project would not substantially impact wildlife resources.

Operational Impacts

Operational impacts from implementation of ISEGS were determined to be similar to those outlined above under “Construction.” In summary, impacts would occur on vegetation and special-status plants from increased dust generation and the potential spread of noxious weeds, and on desert tortoise and other special-status wildlife species from increased road traffic, noise and disturbance, and general degradation of habitat. The operation of ISEGS would result in increased noise levels during the daytime operational hours. The increased noise levels would be much lower than the noise resulting from construction activities, and the applicant would implement noise-reducing measures as outlined in the Application for Certification. The ISEGS FSA/DEIS concluded any increase in noise levels due to operational activities would not substantially impact wildlife resources.

Potential impacts to wildlife resources that are unique to the operation of ISEGS would include impacts to birds due to collision with new structures, risk of burns to birds that flew into the reflected sunlight between the heliostats and the power towers, and effects of continuous human disturbance and lighting alteration. The ISEGS FSA/DEIS concluded that implementation of mitigation measures would reduce these listed impacts and therefore the ISEGS project would not substantially impact wildlife resources.

BLM’s FEIS Impact Conclusions

Similar to the CEC conclusions, the BLM determined that construction, operation, and decommissioning of the ISEGS project could impact biological resources. Where impacts were identified, identified mitigation measures would be implemented during all appropriate phases of the project. The Mitigated Ivanpah 3 alternative was developed to reduce the overall surface footprint of the project, specifically in an area of high quality native habitat characterized by numerous ephemeral washes. This area contains special status species, including desert tortoise. Further, the reduction in surface disturbance along the northern portion of the ISEGS project would reduce the encroachment on potential movement corridors by big game, particularly bighorn sheep.

Construction Impacts

Potential impacts to sensitive plant species from surface disturbance-related activities may include the loss of individuals as a result of crushing from construction vehicles and equipment. Because surface disturbance would be distributed over a relatively large geographic area and within an ecological-specific niche, population-level impacts to sensitive plant species may occur. Impacts may include the long-term loss of potentially suitable habitat until closure/decommissioning and native vegetation has been reestablished. Prior to construction, specified plants species within any project-related surface disturbance areas would be salvaged and relocated to either the 7-acre Rare Plant Transplantation Area or the 59-acre Succulent Nursery Area. Pending further consultation and BLM and Energy Commission review and concurrence, additional construction-related mitigation may be required. To the maximum extent practical, plant species of concern located within the heliostat fields would be avoided and protected during construction through the use of fencing to avoid inadvertent encroachment. Monitoring of these extant plant species of concern within the heliostat fields would be conducted.

Indirect impacts may include the introduction or spread of noxious weeds and invasive plant species. Noxious weed control through use of biological, mechanical, chemical, or various alternative methods may also indirectly impact species individuals and may alter potentially suitable habitat through changes in vegetation community cover and composition.

In terms of special status plant species, construction activities would have limited impacts to Rusby's desert mallow. Dust from construction activities may stress plants within the construction area. Plant avoidance and protection areas within the heliostat fields would be fenced during construction to avoid inadvertent encroachment. Dust from construction activities may stress plants within the construction area. Fencing would be removed following construction and an alternative marking material (e.g., posts or stakes) would be installed for operations to indicate the areas where avoided plants are located. This mitigation measure attempts to preserve ecological connectivity between the 433-acre northern portion of Ivanpah Unit 3, the smaller Rusby's desert mallow avoidance and protection areas, and other areas of undisturbed contiguous habitat, allowing seed dispersal, pollinator movement, and other ecological processes to occur. Rusby's desert mallow plant avoidance and protection areas within the heliostat fields would be monitored to ensure the areas remain protected.

Many impacts to wildlife resources would be incrementally reduced by the amount of habitat eliminated from disturbance in the Mitigated Ivanpah 3 alternative. If banded Gila monsters are present they may be harmed during clearing, grading and trenching activities or may become entrapped within open trenches and pipes. Construction activities could also result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Mitigation Measure BIO-11 requires that concurrent with the desert tortoise clearance survey, a biologist perform a preconstruction survey for Gila monsters in the project area, and implement appropriate impact avoidance and minimization measures if detected. Construction of the Mitigated Ivanpah 3 Alternative would disturb acreage that might provide cover, foraging, and breeding habitat for banded Gila monsters. Mitigation Measure BIO-17, the compensatory mitigation plan, could offset the loss of habitat for this species, minimizing potential impacts on the species.

The Mitigated Ivanpah 3 Alternative would have direct, adverse impacts to 3,640 acres of desert tortoise habitat, which would require state and federal endangered species "take" authorizations. The preservation of 433 acres of high quality habitat along the northern portion of the Ivanpah 3 site would maintain a larger expanse of undisturbed habitat and retain important ecological functions, including connectivity with other undisturbed desert tortoise habitat. In addition to the direct loss of tortoise habitat, the proposed project would also fragment and degrade adjacent habitat and could promote the spread of invasive plants and desert tortoise predators (ravens). The Mitigated Ivanpah 3 Alternative was selected and approved by the BLM and CEC; thus, the ROW terms and conditions and the Conditions for Certification identified for the proposed action would be enforced on the Mitigated Ivanpah 3 Alternative. BLM will also require the implementation of any USFWS mitigation identified in the Biological Opinion. As a result, residual impacts to desert tortoise may affect individuals but is unlikely to adversely affect the viability of desert tortoise populations.

Power plant construction would eliminate nesting habitat and result in direct and cumulative impacts to migratory birds, including a number of special status bird species confirmed to be present at the site (golden eagle, burrowing owl, loggerhead shrike, Crissal thrasher, and Brewer's sparrow) due to habitat loss or injury/fatality of individuals. Burrowing owl, loggerhead shrike, Crissal thrasher, and Brewer's sparrow were observed on the ISEGS site and suitable nesting and foraging habitat was identified. Loggerhead shrike, Crissal thrasher, and Brewer's sparrow are likely to be year-round residents in the area. Bendire's thrasher was not found during surveys but potential habitat exists on the site. If construction occurs during the breeding season, construction activities may result in the loss of active resident and migratory bird nests or young, a violation of the federal Migratory Bird Treaty Act and Fish and Game Code section 3503. The applicant has proposed mitigation measures to avoid and minimize impacts to nesting birds that have been incorporated into mitigation measures BIO-11, BIO-15, and BIO-16. Implementation of the applicant-proposed mitigation measures and Mitigation Measure BIO-22 for a MBTA Conservation Agreement would avoid direct impacts to nests, eggs, or young of migratory birds, and would minimize the impacts of construction disturbance to nesting birds.

The proposed project would account for the loss of up to 3,640 acres of golden eagles' available foraging habitat. This minimal amount of loss would not be considered large enough to affect the breeding success of eagles in the project vicinity. There is a potential risk to birds from collisions with mirrors and towers or from burns from flying into the beam from heliostats to towers although information regarding these impacts is limited. Due to limited information, Mitigation Measure BIO-23 would require the conduct of surveys to collect data on bird and bat mortality. Should adverse impacts to these species be identified as a result of those surveys, additional mitigation could be developed to address those impacts.

Pallid and Townsend's big-eared bats have been reported within the project area. Because pallid bats roost in rock crevices and trees as well as caves and mine shafts, the species may experience some loss of roosting habitat. Townsend's big-eared bats primarily roost in caves and mines; therefore, construction activities would not impact roost sites for this species. Both species would experience loss of foraging habitat of up to 3,640 acres associated with the construction of the Mitigated Ivanpah 3 Alternative. Construction impacts to special-status bats would be comparable to construction impacts for other bat species.

Construction of the ISEGS project would disturb 3,630 acres of potential American badger habitat. Based on home range sizes, the project site could potentially support three or more individuals. Construction activities could kill or injure American badgers by crushing them with heavy equipment or could bury them within a den, particularly since badgers are nocturnal and undergo torpor in winter months. Construction activities could also result in disturbance or harassment of individuals. Mitigation Measure BIO-11 requires that concurrent with the desert tortoise clearance survey, a qualified biologist would perform a preconstruction survey for badger dens in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If badgers are detected within the fenced ISEGS project site during desert tortoise clearance surveys, the applicant shall develop and implement a trapping and relocation plan in consultation with the CEC staff and CDFG. Badgers are highly territorial, so displaced or relocated badgers could suffer some increased mortality rates due to displacement if surrounding areas or relocation sites are at carrying capacity.

Bighorn sheep primarily occupy mountainous terrain for habitat, using alluvial fans and washes as seasonal foraging habitat and mountain valleys as movement corridors between mountain ranges. Nelson's bighorn sheep are known to occur in the nearby Clark Mountain Range and could use the ISEGS project site as foraging habitat and possibly as a migratory corridor. However, sufficient project-specific information on use of the site by Nelson's bighorn sheep to identify specific areas that might provide foraging habitat or movement corridors was not provided. Mitigation Measure BIO-24 would prohibit the use of barbed wire fence on the northern perimeter of the Ivanpah 3 site, unless required for security reasons.

Operational Impacts

Direct and indirect impacts to plant communities and individual species from routine operational activities would be similar to those described for construction impacts. In addition, potential impacts to plant species from operational activities may include the loss of individuals as a result of shading caused by heliostat placement. Sensitive plant species may be directly impacted by trampling, partial, or full removal as a result of vegetation maintenance and indirectly impacted as a result of altering potentially suitable habitat through changes in vegetation community cover and composition. Maintenance activities would increase vehicular traffic and increase the potential for dispersal of noxious and invasive weeds.

Operational impacts related to wildlife resources would include increased noise, human presence, and light to the area. Sources of noise during operations would be from mechanical equipment, vehicle traffic, and activities in the maintenance facility.

If the banded Gila monster is present within the Mitigated Ivanpah 3 alternative project area, adverse impacts to individuals are probable. Mitigation Measure BIO-17, the compensatory mitigation plan, could offset the loss of habitat for this species.

Operational impacts to the desert tortoise would be comparable to those experienced by other reptiles within the project area as described above for wildlife resources. Implementation of the applicant-committed mitigation measures, the BLM Mitigation Measures, and USFWS Mitigation Measures from the Biological Opinion would minimize impacts to desert tortoise in the Mitigated Ivanpah 3 Alternative area. Mitigation Measure BIO-17, the compensatory mitigation plan, could offset the loss of habitat for this species.

Long-term loss of nesting and foraging habitat for these special-status bird species would adversely affect local populations of these species within the Ivanpah Valley. However, impacts would be incrementally less than the proposed action due to the preservation of 433 acres of high quality habitat along the northern portion of the Ivanpah 3 site. Project facilities may cause injuries and mortalities due to collisions, heat-related effects, and disorientation. Mitigation Measure BIO-17, the compensatory mitigation plan, could offset the loss of habitat for these species.

Golden eagles do not nest within the project area and while operation of the project would affect 3,270 acres, this loss would not substantially affect the overall amount of foraging habitat in the area. Operational impacts to golden eagles would be monitored and addressed as outlined in Mitigation Measure BIO-28.

Operational impacts to special-status bat species would include loss of foraging and roosting habitat; collision with communications towers, transmission lines, and other elevated structures; risk of heat-related injuries attributable to the reflected and focus beams of solar radiation between the heliostats and the power towers; attraction to nighttime lighting; increased dust; increased noise and increased human activity that disrupts normal behavior; hazards within movement corridors, hampering normal movement between foraging habitat and water sources; and habitat fragmentation. Although habitats adjacent to the project may support some displaced animals, species that are at or near carrying capacity could suffer some increased mortality rates due to displacement.

The Mitigated Ivanpah 3 Alternative would permanently remove approximately 3,270 acres of foraging and denning habitat for American badgers and would fragment and reduce the value of foraging and denning habitat adjacent to the project site. This habitat loss and degradation could adversely affect American badger populations within the Ivanpah Valley. However, compared to the proposed project, the preservation of the 433 acres of high quality habitat along the northern portion of the Ivanpah 3 site would maintain ecological connections to other nearby undisturbed habitats. Mitigation Measure BIO-17, the compensatory mitigation plan, could offset the loss of habitat for this species.

One of the primary objectives of the Mitigated Ivanpah 3 Alternative was to increase the availability of seasonal forage for Nelson's bighorn sheep on the alluvial fan, though the project area represents a small fraction of the total available habitat. Furthermore, the Mitigated Ivanpah 3 Alternative would preserve 433 acres of high quality habitat along the northern portion of the Ivanpah 3 site. This modification would enlarge the available movement corridor for bighorn sheep and other big game between the Clark Mountain Range and the Stateline Hills. This modification would reduce direct and indirect impacts associated with human encroachment, such as increased stress from dust and human activity. Stress has been shown to increase frequency of disease in some populations. Loss of surface water sources also may diminish the viability of existing populations. The project is unlikely to affect seeps and springs located in the Clark Mountain Range and the bighorn sheep that use these water sources. Implementation of Mitigation Measure BIO-19 would create a new water source in the eastern part of the Clark Mountain Range or in the Stateline Hills outside of designated wilderness. This artificial water source would supplement existing supplies and likely shift foraging opportunities into other areas within the lower elevations of the mountains, away from areas of the bajada lost to ISEGS facilities and the zone of disturbance on the north. This water source would also serve to attract the bighorn during seasonal movements and keep them in the mountainous portion of the wildlife corridor.

Decommissioning Impacts

Upon decommissioning of the ISEGS generation plant, generation facilities and equipment would be removed from the site, and the site would be re-contoured and reclaimed to mirror the natural setting. Direct and indirect impacts to biological resources from closure/decommissioning activities would be similar to those described for construction impacts. Reestablishment of desert vegetative communities would take decades and may differ in composition than the pre-disturbance vegetative community. Permanent changes in the vegetative communities would alter the ecosystem's ability to sustain the same type and numbers of species currently found at the site.

In addition, potential impacts to CNPS plant species from closure/decommissioning activities may include the loss of individuals during structure removal and subsequent revegetation. If biological, mechanical, chemical, or various alternative methods are used to control noxious weed species during closure, direct and indirect impacts may include partial or full plant removal and indirectly alter potentially suitable habitat through changes in vegetation community cover and composition. Long-term restoration of the project area likely would result in a greater frequency of noxious and invasive weeds as well as lower density and diversity of native plant species, including sensitive plant species.

The ability of Rusby's desert mallow to recolonize the area would be improved in the Mitigated Ivanpah 3 Alternative, relative to the original proposed project, due to the preservation of ecological connectivity with other areas of undisturbed, contiguous native plant communities, allowing seed dispersal, pollinator movement, and other ecological processes to occur.

Because reestablishment of desert vegetative communities would take decades and may differ in composition than the pre-disturbance vegetative community, these permanent changes in the vegetative communities would alter the ecosystem's ability to sustain the same type and numbers of wildlife species currently found at the site (including desert tortoise, special-status bird species, American badger, and bighorn sheep). The ability of wildlife to recolonize the area would be improved in the Mitigated Ivanpah 3 Alternative due to the preservation of ecological connectivity with other areas of undisturbed, contiguous native habitat. The ability of individual species to eventually recolonize the reclaimed area will depend on the proximity of other populations, connectivity of habitats, and the mobility of the species. Terrestrial species with small home ranges will not colonize as quickly, if at all, compared to flying organisms or wildlife with large home ranges. The degree of habitat fragmentation within the region also will affect wildlife species ability to recolonize the reclaimed area. Long-term restoration of the project area likely would result in a lower density and diversity of wildlife species, compared to the original intact ecosystem.

Based on the low probability of occurrence within the site, the Mitigated Ivanpah 3 Alternative would not likely adversely affect banded Gila monster.

While reestablishment of desert vegetative communities would take decades and may differ in composition compared to the pre-disturbance vegetative community, the reclamation of the project site would incrementally increase the amount of foraging habitat available to golden eagles and special-status bat species in the region. The absence of structures would reduce injuries and fatalities due to collision and heat-related impacts to special-status bat species.

3.4.5.4 ISEGS Conditions of Certification / Mitigation Measures

~~The ISEGS FSA/DEIS recommends that the following Conditions of Certification be required by the CEC and the BLM to lessen impacts to biological resources if the project is approved:~~

The following Conditions of Certification related to biological resources are required by the CEC for the ISGES project:

BIO-1 requires the project applicant to assign at least one Designated Biologist to the project.

BIO-2 requires that the Designated Biologist perform surveys during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, or closure activities.

BIO-3 requires the applicant's BLM- and Compliance Project Manager (CPM)-approved Designated Biologist to submit a resume with at least three references and contact information for the proposed Biological Monitors to BLM's Authorized Officer and the CPM.

BIO-4 requires that the Biological Monitors assist the Designated Biologist in conducting surveys and in monitoring of mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist must remain the contact for the applicant, BLM's Authorized Officer, and the CPM.

BIO-5 requires the applicant's construction/operation manager to act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

BIO-6 requires the applicant to develop and implement an ISEGS-specific WEAP and to secure approval for the WEAP from USFWS, CDFG, BLM's Authorized Officer, and the CPM. The WEAP must be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP must be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure.

BIO-7 requires the applicant to develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and submit two copies of the proposed BRMIMP to the BLM Authorized Officer and the CPM (for review and approval), and to implement the measures identified in the approved BRMIMP. The BRMIMP must incorporate avoidance and minimization measures described in final versions of the Desert Tortoise Translocation Plan; the Raven Management Plan; the Closure, Revegetation and Rehabilitation Plan; the Burrowing Owl Mitigation and Monitoring Plan; and the Weed Management Plan.

BIO-8 requires the applicant to undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence installation, tortoise handling, artificial burrow construction, egg handling and other procedures must be consistent with those described in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999) or more current guidance provided by CDFG and USFWS. The project owner must also implement all terms and conditions described in the Biological Opinion prepared by USFWS.

BIO-9 requires the applicant to develop and implement a final Desert Tortoise Relocation/Translocation Plan that is consistent with current USFWS-approved guidelines and meets the approval of the BLM, USFWS, CDFG, and the CEC staff. The final plan must be based on the draft Desert Tortoise Relocation/Translocation Plan prepared by the applicant (dated May 2009) and must include all revisions deemed necessary by the BLM, USFWS, CDFG, and the CEC staff.

BIO-10 requires the applicant to provide CEC and BLM representatives with reasonable access to the project site and mitigation lands under the control of the project owner and to otherwise fully cooperate with the CEC's and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the Conditions of Certification. The project owner must hold the Designated Biologist, the CEC, and the BLM harmless for any costs the project owner incurs in complying with the management measures, including stop work orders issued by BLM's Authorized Officer, the CPM, or the Designated Biologist.

BIO-11 requires the applicant to implement all feasible measures to avoid or minimize impacts to biological resources.

BIO-12 requires the applicant to implement a Raven Management Plan that is consistent with the most current USFWS-approved raven management guidelines and that meets the approval of the BLM, USFWS, CDFG, and the CEC staff.

BIO-13 requires the applicant to implement a Weed Management Plan that meets the approval of the BLM and the CEC staff. The draft Weed Management Plan submitted by the applicant would provide the basis for the final plan, subject to review and revisions from the BLM and CEC staff, USFWS, and CDFG.

BIO-14 requires the applicant to develop and implement a revised Closure, Revegetation, and Rehabilitation Plan in cooperation with BLM and CEC staff, USFWS, and CDFG to guide site restoration and closure activities, including methods proposed for revegetation of disturbed areas immediately following construction and rehabilitation, and revegetation upon closure of the facility. This plan must address preconstruction salvage and relocation of succulent vegetation from the site to either an onsite or a nearby nursery facility for storage and propagation of material to reclaim disturbed areas. In the case of unexpected closure, the plan should assume restoration activities could possibly take place prior to the anticipated lifespan of the plant.

BIO-15 requires the applicant to conduct preconstruction nest surveys if construction activities would occur from February 1 through August 31.

BIO-16 requires the applicant to implement burrowing owl impact avoidance and minimization measures.

BIO-17 requires the applicant to fully mitigate for habitat loss and potential take of desert tortoise. The applicant would provide compensatory mitigation at a 3:1 ratio for impacts to ~~4,073~~ 3,582 acres or the area disturbed by the final project footprint. At least two-thirds of the 3:1 mitigation to satisfy the CEC's Complementary Mitigation Measures would be achieved by acquisition, in fee title or in easement, of no less than ~~8,146~~ 7,164 acres of land suitable for desert tortoise. The project owner would provide funding for the acquisition, initial habitat improvements, and long-term management endowment of these CEC-complementary compensation lands. The remaining third of the 3:1 compensatory mitigation, to satisfy BLM's mitigation requirements and the balance of the CEC's mitigation requirements, would be developed in accordance with BLM's desert tortoise mitigation requirements as described in the document Northern and Eastern Mojave Desert Management Plan (BLM 2002a). BLM's compensatory mitigation plan, serving as one-third of the 3:1 mitigation ratio required to satisfy CESA, would include acquisition of up to ~~4,073~~ 3,582 acres of land within the Eastern Mojave Recovery Unit, or desert tortoise habitat enhancement or rehabilitation activities that meet BLM, CDFG, USFWS, and CEC approval, or some combination of the two.

BIO-18 requires the applicant to implement measures to avoid and minimize impacts to special-status plant species. Due to the wide distribution throughout the project site, the impacts to Mojave milkweed and desert pincushion cannot be sufficiently reduced by the applicant's proposed avoidance alone. The majority of Mojave milkweed and desert pincushion occur outside the areas proposed for complete impact avoidance. Furthermore, the occurrences for which complete avoidance could not be achieved represent a substantial proportion of the remaining state occurrences. Therefore, CEC staff includes a Mojave milkweed compensatory mitigation component into BIO-18 and retains the on-site impact minimization for desert pincushion in the applicant's special-status plant mitigation plan. A summary of mitigation measures includes:

- On–site plant avoidance/minimization areas includes at a minimum, the removal of the three areas totaling 476 acres and labeled "Rare Plant Mitigation Area" in the ISEGS project description from the project footprint. Impact minimization shall be conducted throughout the site and impact minimization within the solar field shall consist of protecting small perimeters around Mojave milkweed, desert pincushion, and Rusby's desert-mallow plants.
- Protection of 75 percent of small-flowered androstephium, Mojave milkweed, desert pincushion, nine-awed pappus grass, Parish's club cholla, and Rusby's desert-mallow within the project area.
- Identification and establishment of special-status plant protection areas.
- Protection of adjacent occurrences, development and implementation of a special-status plant protection and monitoring plan, development of a special-status plant remedial action plan, seed collection, gas pipeline revegetation and monitoring, surveys on acquired and public lands, security of implementation of plans, and acquisition of off-site occurrence of Mojave Milkweed or adjacent land.

BIO-19 requires the applicant to compensate for project impacts to Nelson's bighorn sheep by financing, constructing, and managing an artificial water source in the eastern part of the Clark Mountain Range or in the State Line Hills outside of designated Wilderness.

BIO-20 requires the applicant to implement measures to avoid, minimize, and mitigate for impacts to ephemeral drainages. The compensation measures include acquisition of off-site desert washes with at least 175 acres of state jurisdictional waters.

BLM Mitigation Measures

In addition to the CEC Conditions of Certification, the BLM proposes additional mitigation measures and standard ROW grant terms and conditions. The BLM required mitigation measures are the same as the CEC Condition of Certification for BIO-8, BIO-9, BIO-12, BIO-13, BIO-14, and BIO-17. The following mitigation measures required by BLM were identified after the CEC hearing process was completed.

BIO-21 requires that the applicant shall consult with USFWS, BLM, and CDFG to obtain lists of special-status plant species that have the potential for occurrence on the project area. Based on these species' lists provided by these agencies, the BLM shall consider whether further field surveys shall be conducted during the appropriate season and within suitable habitat in the project area utilizing survey protocols appropriate for the species' of interest. If special-status plant species occurrences are identified, the preferred mitigation would consist of avoidance, whenever practical. If not feasible for special-status species, off-site mitigation would be negotiated with the BLM.

BIO-22 requires that the applicant prepare a MBTA Conservation Agreement in coordination with the USFWS, BLM, and CDFG. This Plan would identify procedures to minimize or eliminate impacts to MBTA species.

BIO-23 requires that the applicant shall conduct visual biweekly surveys for bird and bat mortalities throughout the project site. In addition to the photodocumentation of bird mortalities (Item #14 in BIO-11), mortalities and injuries to bats and other wildlife shall be photodocumented. Additionally, data would document the species affected and any overt signs of injury resulting in death (e.g., scorched feathers). This information would be compiled and provided to the BLM at quarterly intervals for the first three years, then annually thereafter, unless otherwise requested by the BLM. The BLM would maintain the authority to require additional mitigation of the applicant in the future to reduce collision or heat-related injuries.

BIO-24 requires that the applicant shall not use barbed wire fence on the northern perimeter of the Ivanpah 3 site, unless required for security reasons, in order to minimize potential impacts to Nelson's bighorn sheep.

BIO-25 requires that the applicant shall monitor and control noxious and invasive weeds within 100 feet of the artificial water source. Control of weeds shall be coordinated with BLM staff and shall consist of removal by mechanical methods, rather than herbicides.

BIO-26 requires that the applicant shall implement all mitigation identified by the USFWS in the Biological Opinion.

BIO-27 requires that the project owner implement the Closure, Revegetation, and Rehabilitation Plan, Revision 3, dated July 6, 2010, with the following modifications.

- The long-term soil stockpiles, will be no higher than 6 feet.
- The Preliminary Seeding Plan for Short-Term Disturbed Areas will be based upon the species list provided in Table 7-1 of the plan and may be modified at the time of decommissioning based on seed availability.
- Concrete will be removed to a minimum depth of 6 feet unless it is shown that a particular area is prone to flood hazards and a greater depth for concrete removal should be required. All concrete removed shall be

hauled off the project site and disposed of in an approved facility. Crushed concrete will not be used as backfill on the site during decommissioning.

- Succulents salvaged during project construction will not be sold by the applicant. Should excess succulents be removed that connot be transplanted in the Succulent Nursery Area, their disposition will be managed by the BLM.

BIO-28 requires compliance with Eagle Act. USFWS believes that this project can reach the “no net loss” standard for golden eagles identified in the Eagle Act Rule if the applicant submits and implements an Avian Protection Plan. The holder shall submit an Avian Protection Plan for approval of the Authorized Officer within 6 months of the issuance of any ROW grant for the project. The Avian Protection Plan must be implemented within one year from the date of any ROW grant Notice to Proceed.

3.4.5.5 Combined Impact of EITP and ISEGS

In combination with ISEGS, the EITP would incrementally contribute to the projected loss of natural vegetation and sensitive natural communities within the project impact area. Together, the EITP and ISEGS would disturb and/or remove approximately 4,025 acres of desert vegetation, including temporary and permanent impacts to several special-status plants. The EITP has a relatively small construction footprint despite its linear extent, is limited in duration (18 months), and requires a maximum of 190 construction workers. Most of the elements of the EITP would be constructed within an existing ROW where the native vegetation has already been disturbed. However, the construction of the Ivanpah Substation, as part of both EITP and ISEGS, would require a large swath of habitat disturbance/removal in previously undisturbed, higher quality desert vegetation. ISEGS would have a relatively large construction footprint, would require 4 years of construction, and require a relatively large workforce. The geographic and temporal extent of impacts from EITP in combination with ISEGS would result in substantial impacts in the project area.

The construction of ISEGS and EITP would result in the same type of impacts to protected plant species as described for each project individually. The following seven sensitive plant species were determined to occur within the construction footprint of both projects: small-flowered androstephium, Mojave milkweed, desert pincushion, nine-awed pappus grass, Parish’s club cholla, Rusby’s desert-mallow, and Utah vine milkweed. Construction impacts to these seven special plant species resulting from EITP would be less than significant due to the relatively small construction footprint and the ability of the project to avoid areas containing high concentrations of sensitive plant species. The inclusion of ISEGS with EITP would result in an increase in the extent of the adverse impacts during construction to these sensitive plant species due to high concentration of six of these species within the ISEGS construction footprint and the approximately additional 3,539 acres of desert habitat that would be impacted. Therefore, together ISEGS and EITP would result in significant impacts to small-flowered androstephium, Mojave milkweed, desert pincushion, nine-awed pappus grass, Parish’s club cholla, and Rusby’s desert-mallow.

The construction of ISEGS and EITP would result in adverse impacts to several sensitive wildlife species such as, but not exclusively, migratory birds, golden eagle, American badger, Nelson’s bighorn sheep, Gila monster, and desert tortoise. The two projects together would result in similar impacts to sensitive wildlife species as is described for each project individually, however the addition of ISEGS to EITP would result in an increase in the extent and intensity of the impacts due to the approximately additional 3,539 acres of wildlife habitat that would be removed. Except for the impacts to desert tortoise, the combination of EITP and ISEGS would not result in significant impacts to sensitive wildlife species following the implementation of appropriate species-specific mitigation measures outlined for both proposed projects.

ISEGS and EITP together would adversely impact desert tortoise and desert tortoise habitat. Each project individually was determined to result in significant impacts even with implementation of the recommended mitigation measures; therefore, the combination of the ISEGS and EITP would result in significant, unavoidable impacts to desert tortoise and desert tortoise habitat. The construction of the EITP was determined to result in significant impacts to desert tortoise due to the portions of the project that would result in permanent and temporary impacts to designated critical habitat. The addition of the ISEGS to the EITP would not result in an increase of impacts to designated critical habitat but would result in an overall increase in the total amount of desert tortoise habitat that would be permanently impacted. ISEGS would result in the loss of 3,582+ acres and would require the translocation of all tortoises that are determined to occur within the proposed fenced area of the project. The addition of ISEGS to EITP would collectively result in increased road traffic due to construction, thus increasing the road kill hazard to desert tortoise. The additional construction would also increase raven and coyote presence and would increase desert tortoise predation levels. Mitigation compensation required of both projects for the desert tortoise would minimize and offset adverse impacts to the species.

Operational impacts from implementation of ISEGS together with EITP were determined to be similar to those outlined above under construction. The addition of ISEGS would increase the intensity and spatial extent of the impacts that would occur on vegetation and special-status plants from larger amounts of habitat removal, increased dust generation, and the potential spread of noxious weeds. Additionally, impacts on desert tortoise and other special-status wildlife species would occur from both projects resulting from increased road traffic, noise, human presence and disturbance, and general degradation of habitat. The addition of ISEGS to EITP would result in increased noise levels during the daytime operational hours. Potential impacts to wildlife resources that would be unique to the operation of ISEGS would include impacts to birds due to collision with new structures, risk of burns to birds that flew into the reflected sunlight between the heliostats and the power towers, and effects of continuous human disturbance and lighting alteration. ISEGS implementation of additional mitigation measures addressing these unique impacts would reduce these listed impacts; therefore, the combination of EITP and ISEGS would not substantially impact wildlife resources. With all APMs and mitigation measures in place, the combination of operation of the two projects would not result in a substantial increase in impacts to wildlife and plant resources compared to the operation of EITP as an individual project.

Together, impacts from the two projects would have short- and long-term contributions of less-than-significant impacts with mitigation to impacts on biological resources in the project area. The exception would be impacts to desert tortoise, which would be significant even after mitigation due mainly to construction of ISEGS and EITP. See also Section 5.3.5.4, “Cumulative Impact Analysis,” for a discussion of cumulative impacts of biological resources from ISEGS and EITP as a Whole of the Action / Cumulative Action analysis.

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3.5 Cultural Resources and Native American Values

This section contains a description of the environmental setting, regulatory setting, and potential impacts associated with the construction and operation of the proposed project and alternatives with respect to cultural resources. This section includes background data compiled from cultural resources records searches conducted at the San Bernardino County Archaeological Information Center, located at the San Bernardino County Museum in Redlands, California; the Harry Reid Center for Environmental Studies at the University of Nevada, Las Vegas; and online with the Nevada Cultural Resources Information System. Additional data included in this section was acquired from an intensive cultural resources field survey of the project area following the records searches. A full report of the cultural resources findings for this project is documented in *lass lt al eso es n ento y o the n alifo nia ison l o a o anpah T ans ission o e t an e na ino o nty alifo nia an la k o nty e a a* (Chambers Group 2009).

3.5.1 Environmental Setting

The environmental setting section characterizes the terrain and resources immediately surrounding the right-of-way (ROW) of the project, including data from the nearby surrounding landforms, since they may influence the nature and quantity of cultural resources in the area. A more expansive description of the cultural setting is provided, since cultural resources occur intermittently throughout time and space.

3.5.1.1 Physiography and Geology of Proposed Route and All Alternatives

The EITP is in southern Nevada and southeastern California in the Mojave Desert geologic province of the Great Basin. This linear project passes through the Eldorado Valley, McCullough Mountains, Jean Valley, Ivanpah Valley, and Clark Mountains. The proposed route skirts the eastern edge of Roach Dry Lake and passes through the northern portion of Ivanpah Dry Lake. The Mountain Pass and Golf Course alternatives for the Telecommunication Route are located south of the proposed transmission line route. These alternatives pass through Eldorado Valley between the McCullough and Highland mountain ranges, through Big Tiger Wash between the McCullough and New York ranges, through Ivanpah Valley transecting the southern edge of Ivanpah Dry Lake, and through Mountain Pass near Wheaton Springs.

The geology of the project area consists of alluvial deposits in the valleys and bedrock in the mountains. The alluvial deposits were deposited during the Holocene (which began 11,000 years ago), whereas stream deposits date to the early to late Pleistocene (1.8 million to 11,000 years ago). The bedrock is volcanic rock, primarily basalt. Some of the alluvial fan surfaces exhibit poorly to moderately well developed desert pavement with desert varnish. Recent research displaced an earlier view that desert pavements formed in an erosional environment, finding instead that the "… desert pavement surface is a single layer of clasts borne upward on an ever-accreting layer of eolian silt" (Hill 2008). This new view of desert pavement led to testing that yielded artifacts to a depth of 2.6 feet below the surface throughout the column of cobble-free eolian silt that typically makes up the substrate of desert pavements. It was concluded from this testing that artifacts worked into an older desert pavement can predict subsurface archaeological deposits, and that the occupation surface of a site on a terminal Pleistocene or early Holocene alluvial fan is likely to be several feet below the current pavement (CH2M Hill and Carrier 2008).

The alluvial deposits can be more than 80 inches deep in portions of the project area and could have buried cultural resources within them (SCE 2009).

3.5.1.2 Cultural History

This section describes human occupation of the general project area over the Prehistoric, Protohistoric or Ethnographic, and Historic periods. The division between Historic and Prehistoric time is marked by the keeping of written records. The Protohistoric period occurred before European settlement in the area; however, the Native American culture was influenced in the Protohistoric period by European culture through intertribal trade networks.

Prehistoric

The Prehistoric period encompasses the time of the first peopling of the Americas until the arrival of the first Europeans who began keeping written records of the area. The Prehistoric period is subdivided into the Paleo-Indian, Archaic, and Late Prehistoric eras. The Paleo-Indian occupation (12,000 to 10,000 calibrated years before the present [cal BP]) is thought to have occurred throughout North America and represents the first influx of people into the Mojave during the end of the last ice age. Several sites throughout the Americas have hinted at an earlier human occupation of the continents; however, no sites found in the Mojave can be attributed to pre-Clovis (a culture that first appeared 11,500 radiocarbon years cal BP). There are arguments for an even earlier occupation; however, chronological indicators for these sites are disputed.

The Paleo-Indian occupation in the Mojave Desert is poorly represented by artifacts, or at least has been poorly documented to date (Sutton 1996). Fluted Clovis points are the main diagnostic artifact representing this period, and they have been found in the region; however, such finds have generally been isolated surface finds (Sutton et al. 2007). The dearth of Paleo-Indian sites and diagnostics may be more a function of sample bias than of actual absence. To date, the archaeological community has not searched beneath the surface of desert pavement surfaces for older occupations. Research into the age of desert pavements and the potential for subsurface cultural resources may lead to significant discoveries about the Paleo-Indian presence in the Mojave Desert.

The Archaic period coincides with the early and middle Holocene epoch, a time when the climate was cooler and moister than currently. The Lake Mojave, Pinto, Deadman Lake, and Gypsum groups of artifacts (complexes) represent different shifts in technology and subsistence methods throughout the Archaic period. The Lake Mojave complex (10,000 to 8,000 cal BP), characterized by Great Basin stemmed series projectile points such as Lake Mojave and Silver Lake points, is the earliest complex represented during the Holocene. Chronologic indicators are uncommon for this complex, as many of the sites have been surface finds. Lake Mojave is well represented at Fort Irwin, China Lake, and Twentynine Palms. Lake Mojave complex sites offer evidence of long-distance trade networks to the coast and a wide foraging base for lithic raw materials (Sutton et al. 2007).

The Pinto complex (8,000 to 5,000 cal BP) is thought to have begun in the early Holocene, overlapping with the end of the Lake Mojave complex. Sites with artifacts diagnostic to the Pinto complex are widespread and well represented in the Mojave Desert. Diagnostic artifacts from this complex include Pinto series projectile points and a marked increase in the use of groundstone implements, indicating a substantial shift to a greater emphasis on plant resources. Trade with coastal communities continued during this time, as evidenced by the presence of olivella shell beads (Sutton et al. 2007).

The Gypsum complex (4,000 to 1,800 cal BP) is defined by the presence of Elko, Humboldt, and Gypsum series projectile points. The material culture from Gypsum complex assemblages implies increased trade activities and an increase in social complexity. Quartz crystals, paint, and rock art panels are commonly attributed to Gypsum components (Sutton et al. 2007).

The onset of the Late Prehistoric is demarcated from the Archaic by the introduction of the bow and arrow and the phasing out of *atlatl* (spear thrower) technology. The Rose Spring complex (1,800 to 900 cal BP) coincides with a time of increased rainfall in at least some parts of the Mojave Desert. An increase in population, the presence of Eastgate and Rose Spring series projectile points, well developed midden remains, and a marked shift in material culture are all hallmarks of the Rose Spring complex. Sites attributed to this complex are commonly found near springs and along washes and lakeshores (Sutton et al. 2007). The Rose Spring complex is sometimes discussed along with the above-described Archaic complexes; however, the use of bow and arrow technology during the time tools in this complex were used makes it more suitable to be discussed in the Late Prehistoric period.

In the post-Rose Spring complex time there appears to have been a decrease in population and the onset of a dryer, warmer climate. The habitation pattern from this era includes habitation sites with associated cemeteries surrounded by special-purpose and seasonal sites. Desert series projectile points, such as Cottonwood and Desert side-notched, and the introduction of ceramics, steatite beads, and slate pendants are hallmarks of this era. The Late Prehistoric era is not well understood in the Eastern Mojave due to a lack of both fieldwork and research (Sutton et al. 2007).

Protohistoric and Ethnographic

The Southern Paiute have been the recorded occupiers of the project area since the Protohistoric period. They are defined as a hunter-gatherer foraging culture and are particularly known for their skilled manufacture of baskets, brownware pottery, and sketched and engraved petroglyphs in the southern Great Basin. The Southern Paiute are subdivided into the Chemehuevi, Las Vegas, Moapa, Pahranagat, Gunlock, Saint George, Shivwits, Uinkaret, Cedar, Beaver, Panguitch, Kaibab, Kaiparowits, Antarianunts, and San Juan.

The habitation pattern of the Southern Paiute was largely based on the seasons, to take advantage of seasonal food resources. Winters were generally spent at higher elevations, and summers were spent in the lowland areas. The Chemehuevi lived in earth-covered dwellings and relied heavily on agave, pine nuts, other seeds, and small and large game for subsistence (Sander et al. 2009).

Historic

Francisco Garces, Francisco Atanasio Dominguez, and Silvestre Velez de Escalante were the first documented Europeans to come into contact with the Paiute, in 1776. Colonization of the Paiutes did not commence until 1810, when Spanish settlers along the upper Rio Grande began baptizing the natives. By the 1830s, the Paiute were being traded as slaves along the Old Spanish Trail. The Paiute slave trade came to an end in the 1850s due in large part to the influence of Mormon expansion into Nevada and Utah. In the 1860s the American government began resettling the Southern Paiutes onto reservations (Sander et al. 2009).

The Old Spanish Trail was established as an overland supply route from New Mexico to California. The trail passes through the southern tip of Nevada. Other than the trail, the Spanish did not have an economic interest in southern Nevada. The Goodsprings (Yellow Pine, Petosi) mining district in the Spring Mountains north of Clark Mountain was consistent from 1893 to 1905 when completion of the San Pedro, Los Angeles, and Salt Lake Railroad (SPLA&SL) stimulated increased mining development and the district became a principal source of zinc with peak production during World War 1 (Longwell et al. 1965). Mining drew many into the southern portion of the state long before the Hoover Dam was proposed. In addition to mining, the completion of the SPLA&SL in 1905 created a land boom in Las Vegas (Longwell et al. 1965). The construction of the Hoover Dam began in 1931 and was completed in 1936. The Boulder (Hoover) Dam transmission line was constructed from 1930 to 1931 over eight months. The dam required electricity, which came from 226 miles away in San Bernardino, California, through the first transmission lines in the area. Once the dam was constructed, the flow of electricity was reversed to provide hydroelectric power to the Los Angeles area. The line is still in use and is currently owned by Southern California Edison (Sander et al. 2009).

The project area crosses the boundary between California and Nevada. The first official border between the two states was established by Allexy W. Von Schmidt, a U.S. astronomer and surveyor, in 1873. Von Schmidt used solar observations to approximate the dividing line between the two states, which resulted in an error in the placement of the line by three quarters of a mile to the south of where it was supposed to be. Von Schmidt had marked the boundary with cast-iron columns and thus the line can still be seen today. The Von Schmidt line has been designated as a California Registered Historical Landmark (No. 859; Sander et al. 2009).

The San Pedro, Los Angeles, and Salt Lake Railroad Company constructed a railway line from Salt Lake City to San Pedro, California. This line crosses the current project area. The line was purchased by Union Pacific in 1921 and is still operated by that company (Sander et al. 2009).

The mountains in the project area offered mineral resources that were desirable for early miners. Gold, copper, silver, and lead were available in the region. While the records search did not yield data pertaining to mining inside the project area, closed mines are located about 1,000 feet outside both sides of the proposed and alternative EITP routes (Appendix F-1). The first mine in the area was established in 1869 in the Clark Mountains. Ivanpah Spring became the supply center to service the mine, and mills were built at Ivanpah by the mid-1870s. In 1898, the Copper World Mine was developed at Rosalie Wells. The mine was in operation until World War I. Mountain Pass was the site of gold and silver finds in 1879. The Mescal Mine was developed in 1882 and was active until 1887. Gold was discovered near Vanderbilt Spring in the New York Mountains in 1891. By 1892, there had been major development of the Gold Bronze and Boomerang mines (Fergusson 2007). It is likely that associated cultural resources such as trails, campsites, and other features associated with mining were in the general project area outside the current Area of Potential Effects (APE) and may prove to be National Register of Historic Places (NRHP)-eligible resources.

The town of Nipton is a historic community located at the intersection of two wagon trails. One of the trails runs east–west from Colorado to the Ivanpah Mine; the other runs north–south from Goodsprings to the railroad and mining settlement, Goffs, near present-day Needles. A Pennsylvania man, Samuel Dunc Karns, staked a mining claim in the area in 1900 that he called Nippeno. The town's name was derived from the name of the mine. Rail lines were routed through the crossroads at the town as part of the San Pedro, Los Angeles, and Salt Lake Railroad Company line in 1905, which continued in operation until the 1950s.

Gambling was legalized in Nevada in the 1930s. This helped shape the state's economy and increase the population, as did the military's establishment of Nellis Air Force Base, Fallon Naval Air Station, and an army base at Tonopah. During Prohibition (1920 to 1933), a man local to the project area, Pete McIntyre, began a lucrative bootlegging operation. "Whiskey Pete," as he came to be known, owned a local gas station and produced moonshine in local mountain caverns. Pete's property was purchased in the 1950s by Ernie Primm, who developed a casino on the property (Sander et al. 2009).

3.5.1.3 Cultural Sites

The survey of the EITP proposed route resulted in the discovery or re-recording of cultural resources along the EITP proposed route, telecommunications route, and alternative routes. These resources are described below. No previously recorded or newly discovered cultural resources were located during the background research or field survey of the Ivanpah Substation site.

Eldorado–Ivanpah Transmission Line Route

Cultural Resource 36-1910 (CA-SBR-1910H)/26CK5685 is the historic Union Pacific Railroad constructed from 1903 to 1904. The site has retained its physical location and overall attributes as a linear transportation system. It was determined by the Harry Reid Center for Environmental Studies at the University of Nevada to be a significant linear structure and is eligible for the NRHP under Criteria A and D (see Section 3.5.3, "Impact Analysis.") It is listed as a significant frontier railroad with urban industrial centers at either terminus. The railroad connected mining communities, homesteads, and numerous towns along its path between Barstow and Salt Lake City. This line aided in furthering western expansion and the exploration and settlement of the southwestern region of the United States. The rail line is also associated with Senator William A. Clark of Montana, who became famous and wealthy from his mining ventures in Montana. He invested in the completion of the railroad and furthered his empire in mining and exploration in the Eastern Mojave and Nevada deserts.

Although this site as a whole is eligible for listing in the NRHP (Chambers 2009), the ~~short sections of the railroad line located within the~~proposed project ~~corridor are not recommended as contributing elements of the structure.~~has been designed to avoid affecting the resource. Regular maintenance and upgrades to the gravel track bed, rails and ties, and Nipton Road have replaced the original historic materials and only the original path of the railroad remains.

Cultural Resource 36-7694 (CA-SBR-7694H)/26CK4957 is the Los Angeles Department of Water and Power (LADWP) Boulder Transmission Line (lines 1, 2, and 3). The lines were built between 1933 and 1940 and were determined eligible for the NRHP in 1994. This site ~~is~~has previously been determined eligible for listing on the NRHP under ~~Criterion~~ Criteria A and C and has elements that contribute to the significance of the resource within the EITP project area. ~~At this point, the~~The applicant ~~intends to~~would span over the LADWP Transmission Line using H-frame towers, thus avoiding any direct impacts to this resource.

Cultural Resource 36-10315 (CA-SBR-10315H)/53-8280 is the Boulder Dam–San Bernardino 132-kV transmission line. This line was built in the early 1930s and was first recorded as a potential cultural resource in 1988. This resource has been determined eligible for the NRHP under Criteria A and C due to its association with the construction of Boulder (Hoover) Dam and expansion of the dam into California. The Proponent's Environmental Assessment indicates that towers from this line would be removed and replaced with new towers to accommodate the existing and new transmission capacity.

Cultural Resource 36-6835 (CA-SBR-6835H) is the Von Schmidt survey line demarcated in 1873 during the original survey of the boundary between California and Nevada. Located approximately 0.75 miles west of the actual state line, the Von Schmidt line was established in the wrong place due to a surveying error. Its only physical presence is a line of cast iron markers. The site is listed as California Historical Landmark No. 859 and Nevada State Historic Marker No. 196. Cultural Resource 36-6835 has been found eligible for the California Register of Historical Resources (CRHR). It has not yet been evaluated for the NRHP, but it would likely be found eligible.

Cultural Resource 36-7689 (CA-SBR-7689H) is the Arrowhead Trail highway. The highway was constructed as a through route between Los Angeles and Salt Lake City via Las Vegas. This site has been determined not eligible for listing on the NRHP.

Cultural Resource 36-13416 (CA-SBR-12574H) is the remains of a telegraph line that served as a communications system for the Boulder Dam Transmission Line. The line itself and telegraph poles have been removed from the site. The site is, therefore, lacking integrity and is recommended not eligible for the NRHP.

Cultural Resource 36-13417 (CA-SBR-12575H) is an unnamed two-track road running east to west that appears to be a route from Yates Well to Ivanpah Springs. The site does not meet the criteria for listing on the NRHP.

Cultural Resource 26CK2633 is a prehistoric lithic scatter that contained debitage, one projectile point, and two biface fragments. The area surrounding the site is characterized by desert pavement, but without any desert varnish development. This site ~~has not been~~was evaluated in 2010 and recommended not eligible for the NRHP ~~eligibility.~~(UNLV 2010).

Cultural Resource 26CK3023 is a small east-facing natural rock shelter in the McCullough Range. Metate fragments, potsherds and chert flakes, and a single petroglyph were recorded on the original Intermountain Archaeological Computer System (IMACS) record form. Subsequent visits to the site yielded a basalt chopper and two additional flakes. This site has been determined not eligible for listing on the NRHP.

Telecommunications Line

Cultural Resource 36-014987 (CA-SBR-~~1312H~~13132H) is a historic trash scatter containing at least 200 beer cans, a few oil cans, an air filter for a vehicle or machine, and at least five broken bottles in a 30-square-meter area. The cans have all been opened using a church-key-style can opener. The maker's marks on the bottles indicate that they were manufactured in between the 1930s and 1950s. This site does not appear eligible for listing in the NRHP; however, a formal NRHP evaluation of site would be conducted if the Mountain Pass alternative is chosen for construction (Sander and Auck 2009).

Cultural Resource 36-014988 (CA-SBR-13133H) is a historic trash mound measuring 4 by 2 meters. The deposit includes charcoal, cinders, rock debris, modern glass, ceramics, and metal fragments as well as sun-colored amethyst glass fragments. The site has been disturbed by relic hunters and is a dump of domestic refuse that likely originated in the nearby community of Nipton. The site is recommended as not eligible for the NRHP (Sander and Auck 2009).

Transmission Alternative Route C

Cultural Resource 36-7689 (CA-SBR-7689H) is a segment of the Arrowhead Trail Highway (State Route 31). This historic road connects Los Angeles and Salt Lake City via Las Vegas. The road alignment that passes through the project area contains the road and an associated scatter of historic refuse, prehistoric artifacts, a corrugated metal pipe, and a brass cap surveyor's monument. This site has previously been determined ~~to be~~ not eligible for listing in the NRHP.

Cultural Resource 26CK4135 is the location of a now-demolished historic structure constructed of a late-dating adobe and cement aggregate compound. The adobe remains are degraded and visible on the ground surface. Material debris is found throughout the immediate area, though it is difficult to determine whether debris is associated with the structure or with more recent episodes of trash dumping. The site was determined not eligible for the NRHP.

Cultural Resource 36-7694 (CA-SBR-7694H)/26CK4957 is the LADWP Boulder Transmission Line (lines 1, 2, and 3). A full description of the resource can be found under the cultural resource listings for the Eldorado–Ivanpah Transmission Line Route above. The line was determined eligible for the NRHP under Criterion A in 1994.

Transmission Alternative Route D

36-13416 (CA-SBR-12574H) is the remnants of a telegraph pole line and associated dirt road. The ROW is still intact; however, the telegraph line has been removed and many of the poles have been cut down to stumps. This site has the same alignment as the Boulder Transmission Line (36-10315 [CA-SBR-10315H]) and is associated with that line. It has been recommended not eligible for listing on the NRHP.

Telecommunication Alternative (Golf Course)

36-3048 (CA-SBR-3048H) is Old Traction Road and an associated refuse scatter. The road is in poor condition in some places, with deep ruts created by rain water flowing toward the lower elevation of Ivanpah Lake; however, the road bed is still in place and clearly visible. Old Traction Road is recommended as eligible for listing in the NRHP under Criterion A for its association with the broad pattern of transportation modes dating from the early 1900s. The portions of Old Traction Road that may be affected by the EITP development are not recommended as contributing elements of the resource (Chambers 2009). Regular maintenance and upgrades to the road bed, shoulder, and Nipton Road have replaced the original historic materials and only the original path of Old Traction Road remains.

36-7802 (CA-SBR-7802H) is a historic roadside scatter of household refuse dominated by evaporated milk cans or food cans that were discarded in the early 1900s. This site has been recommended not eligible for the NRHP due to disturbances associated with road maintenance, and the site testing results from the EITP investigations support this recommendation (Sander and Auck 2009).

36-014496 (CA-SBR-12980H) is Nipton Road. The road was originally a dirt track established as a wagon trail connecting the mines east and west of Nipton to the railroad stations in Ivanpah Valley. The Copper World Mine used the road to bring raw materials to the Ivanpah Station to be loaded onto railcars for transport. The road was also used by gold miners in Searchlight, Nevada, to send goods to Ivanpah Station. Although this road was significant to the development of the area, historic mining operations, and railroad themes, its improved state as a modern paved road degrades its historic integrity, and no sign of the original wagon trail remains. The roadway is recommended as not eligible for listing on the NRHP (Chambers 2009).

36-1910 (CA-SBR-1910H)/26CK5685 is the historic Union Pacific Railroad. The railroad was constructed from 1903 to 1904 and has retained its physical location and overall attributes as a linear transportation system. The site was evaluated by the Harry Reid Center for Environmental Studies at the University of Nevada to be a significant linear structure and is eligible for listing in the NRHP. It is listed as a significant frontier railroad with two urban industrial centers at either terminus. The railroad connected mining communities, homesteads, and numerous towns along its path between Barstow and Salt Lake City. This line helped further western expansion and the exploration and settlement of the southwestern region of the United States. The rail line is also associated with Senator William A. Clark of Montana, who became famous and wealthy due to his mining ventures in Montana. He invested in the completion of the railroad and furthered his empire in mining and exploration in the Eastern Mojave and Nevada deserts. This resource is eligible for the NRHP under Criteria A and D (Chambers 2009).~~. However, the short sections of the railroad line located within the project corridor are not recommended as contributing elements of the structure.~~ However, the proposed project has been designed to avoid affecting the resource. Regular maintenance and upgrades to the gravel track bed, rails and ties, and Nipton Road have replaced the original historic materials, and only the original path of the railroad remains.

Telecommunication Alternative (Mountain Pass)

36-7347 (CA-SBR-7347H) is a historic dirt road that crosses the transmission line from east to west. This site ~~has~~does not ~~yet been determined ineligible~~meet the criteria for listing on the NRHP.

36-014497 (CA-SBR-12981H) is a historic trash scatter within a drainage situated between a dirt road and I-15. Approximately 75 cans of various types were found, including coffee, beer, soda, and juice cans. Bottles showed maker's marks dating to the late 1940s and early 1950s. The site is likely associated with the nearby sand and gravel borrow pit. It is heavily disturbed by erosion and off-road driving, and subsurface deposits were not found during testing of the site. The site is likely a part of 36-014498. It has been recommended not eligible for the NRHP.

36-014498 (CA-SBR-12982H) consists of a large historic debris scatter located within a drainage area between a dirt road and I-15. The site contains a large scatter of historic cans, including food cans, motor oil cans, beer cans, soda cans, and evaporated milk cans. Bottles with visible maker's marks dating to the 1940s and 1950s were observed. The site is likely associated with the nearby sand and gravel borrow pit. The site is heavily disturbed by erosion and off-road driving, and subsurface deposits were not found during testing of the site. The site is likely a continuation of site 36-014497 (CA-SBR-12981H). It has been recommended not eligible for the NRHP (Sander and Auck 2009).

Additional Survey of 245 Acres for Proposed Spur Roads, Two Helicopter Landing Zones, and Laydown Areas

In September 2010, additional areas of disturbance required for construction of the EITP were subjected to intensive-level cultural resources surveys. The surveys resulted in relocation of 26CK3023 (discussed above) and recording of four previously unknown cultural resources. The newly recorded resources consist of one historic site, one prehistoric site, one historic isolate, and one prehistoric isolate (Becker 2010).

The historic site, Hel-1, is a light can scatter; the prehistoric site, Hel-2, is a prehistoric pot drop with two ceramic sherds; and the isolates consisted of a biface (Hel-I-2) and an isolated historic can (Hel-I-3). The newly recorded resources have been recommended to be not eligible for inclusion on the NRHP (Becker 2010); however, the BLM has not yet received SHPO concurrence for this determination. If the SHPO concurs with this determination, no further fieldwork will be required. If the SHPO finds either Hel-1 or Hel-2 to meet any of the NRHP eligibility criteria, data recovery excavations will be required to mitigate the impacts to the sites.

3.5.1.4 Tribal Consultation

The BLM initiated consultation with Native American tribes and groups that may have knowledge of the cultural resources of the proposed project area, in accordance with Section 106 government-to-government Tribal consultation requirements. Twenty-three contacts from the following 11 Native American groups were given notice of the proposed project as the first step in the consultation process:

- Chemehuevi Indian Tribe;
- Colorado River Indian Tribes;
- Fort Mojave Tribal Council;
- Las Vegas Paiute Tribe;
- Moapa Band of Paiute Indians;
- Morongo Band of Mission Indians;
- Pahrump Paiute Tribe;
- San Manuel Band of Mission Indians;
- Serrano Nation of Indians;
- Timbisha Shoshone; and
- Twenty-Nine Palms Band of Mission Indians.

A search of the Native American Heritage Commission's (NAHC's) Sacred Lands File (SLF) was conducted to determine ~~the~~ any known Native American cultural resources in the proposed project area. The SLF search failed to indicate the presence of any Native American cultural resources in the proposed project area. As of the date of this document, tribal consultation did not result in the identification of cultural resources or historic properties to which the tribes attach religious or cultural significance within the proposed project area.

3.5.2 Applicable Laws, Regulations, and Standards

The following section summarizes federal, state, and local laws, regulations, and standards that govern cultural resources in the project area.

3.5.2.1 Federal

Code of Federal Regulations (CFR), Title 36 Section 800

This statute protects historic properties and pertains to implementation of the regulations of Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to take into account the effects of a proposed action on historic properties.

National Environmental Policy Act: U.S. Code (USC), Title 42 Sections 4321 et seq.

This statute requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.

Federal Land Policy and Management Act: 43 USC Sections 1701 et seq.

This statute requires the Secretary of the Interior to retain and maintain public lands in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, and air and atmospheric water resources, as well as archaeological values.

Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (Federal Register V.48 N. 190 Part IV p. 44738-44739)

This statute is a set of standards and guidelines for ~~archaeologic~~archaeology and historic preservation. They are considered the appropriate professional methods and techniques for the preservation of archaeological and historic properties and are used by all federal agencies. The California Office of Historic Preservation and the Nevada State

Historic Preservation Office refer to these standards in their requirements for selection of qualified personnel and in the mitigation of potential impacts on cultural resources on public lands in California.

Native American Graves Protection and Repatriation Act (1990): 25 USC Sections 3001 et seq.

This statute requires all federal agencies and museums receiving federal funds to inventory their collections, notify appropriate parties of sensitive collections, acknowledge requests from native groups for repatriation, review the collections and the requests, and, if appropriate, repatriate human remains, grave associations, sacred objects, and items of cultural patrimony to affiliated tribes or individuals. It establishes that Native American human remains legally belong to the nearest affiliated Indian tribe or family of known individuals, rather than with the owner of the land on which they were found. This statute also requires that archaeologists consult with land management officials prior to conducting field work on federal land or in a federal undertaking.

Executive Order 11593, May 13, 1971 (36 CFR 8921)

This order mandates the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.

American Indian Religious Freedom Act: Title 42, USC Section 1996

This statute protects Native American religious practices, ethnic heritage sites, and land uses.

U.S. Department of the Interior, Bureau of Land Management, the California Desert Conservation Area Plan 1980 as amended – Cultural Resources Element Goals

This plan establishes BLM goals to increase archaeological and historical knowledge of the California Desert Conservation Area (CDCA) through continuing efforts and use of existing data. It also establishes goals to identify the full array of cultural resources within the CDCA, preserve and protect a representative sample of the full array of the CDCA's cultural resources, ensure that cultural resources are given full consideration in land use planning and management decisions and that BLM-authorized actions avoid inadvertent impacts, and ensure proper data recovery of significant cultural resources where adverse impacts cannot be avoided.

Archaeological Resources Protection Act (ARPA) of 1979, Public Law 96-95; 16 USC 470aa-mm)

ARPA prohibits the excavation or removal of an archaeological resource from federal or traditional Native American lands without a permit from the appropriate land management agency. Under ARPA, the sale, purchase, exchange, transport, or possession of an archaeological resource removed without permission of the land management agency is forbidden. Violators convicted of violation of ARPA are subject to fine and imprisonment.

3.5.2.2 State

California

Public Resources Code (PRC) Sections

5020–5024. These sections are statutes that pertain to the protection of historical resources.

5097.98 (b) and (e). These sections requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until conferring with the most likely descendants (as identified by the Native American Heritage Commission) to consider treatment options.

5097.91–5097.991. These sections pertain to the establishment and authorities of the Native American Heritage Commission (NAHC). Sections 5097.91–5097.991 also prohibit the acquisition or possession of Native American artifacts or human remains taken from a Native American grave or cairn except in accordance with an agreement reached with the NAHC, and provide for Native American remains and associated grave artifacts to be repatriated.

5097.993–5097.994. These sections establish~~es~~ the Native American Historic Resource Protection Act, which makes it a misdemeanor crime for the unlawful and malicious excavation, removal, or destruction of Native American archaeological or historical sites on public or private lands.

6254 (r). This section established the California Public Records Act which protects Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission by protecting records of such resources from public disclosure.

21083.2. This section of the California Environmental Quality Act (CEQA) provides for protection of archaeological resources by directing the lead agency on any project undertaken, assisted, or permitted by the state to include in its environmental impact report for the project a determination of the project's effect on unique archaeological resources. It enables a lead agency to require an applicant to make reasonable efforts to preserve or mitigate impacts to any affected unique archaeological resource, and sets requirements for the applicant to provide payment to cover the costs of mitigation.

21084.1. This section of CEQA establishes that ~~an~~ adverse effect on a historical resource qualifies as a significant effect on the environment.

25373, 37361. These sections allow~~s~~ city and county legislative bodies to acquire property for the preservation or development of a historic landmark. It allows local legislative bodies to enact ordnances to provide special conditions or regulations for the protection or enhancement of places or objects of special historical or aesthetic interest or value.

65092. This section provides for notice of projects in consideration for construction to be sent to California Native American tribes who are on the contact list maintained by the Native American Heritage Commission.

Health and Safety Code (HSC) Sections

7050 – 7054. These HSC sections are statutes that pertain to disturbance and removal of human remains, felony offenses related to human remains, and depositing human remains outside of a cemetery.

8010–8011. This HSC sections establishes the California Native American Grave Protection and Repatriation Act that is consistent with and facilitates implementation of the federal Native American Graves Protection and Repatriation Act

Senate Concurrent Resolutions

Number 43. This resolution requires all state agencies to cooperate with programs of archaeological survey and excavation, and to preserve known archaeological resources whenever this is reasonable.

Number 87. This resolution provides for the identification and protection of traditional Native American resource-gathering sites on state land.

Administrative Code, Title 14, Section 4307

This code states that no person shall remove, injure, deface, or destroy any object of paleontological, archaeological, or historical interest or value.

California Code of Regulations Section 1427

This code recognizes that California's archaeological resources are endangered by urban development and population growth and by natural forces. It declares that these resources need to be preserved in order to illuminate and increase public knowledge of the historic and prehistoric past of California.

Penal Code Section 622: Destruction of Sites

This code establishes as a misdemeanor the willful injury, disfiguration, defacement, or destruction of any object or thing of archaeological or historical interest or value, whether situated on private or public lands.

Nevada

Nevada Revised Statutes (NRS)

383.150–383.190. This NRS protects Native American graves on private and public land.

451 et seq. This NRS ensures the protection of all human remains on public and private land by establishing penalties of imprisonment, fines, or a combination thereof. The penalties are applicable to both the person who collects the remains and any person who receives or purchases such remains. Section 451.045 establishes a permit obtainable from a local health officer for the disinterment or removal of human remains.

3.5.2.3 Regional and Local

No regional or local ordinances in the project area pertain to cultural resources.

3.5.3 Impact Analysis

This section defines the methodology used to evaluate impacts for cultural resources, including CEQA impact criteria. The definitions are followed by an analysis of each alternative, including a joint CEQA/NEPA analysis of impacts. At the conclusion of the discussion is a NEPA impact summary statement and CEQA impact determinations. For mitigation measures, refer to Section 3.5.4, "Mitigation Measures."

3.5.3.1 NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects to cultural resources would result from the project, and explains the significance of those effects in the project area (40 CFR 1502.16). Significance is defined by Council on Environmental Quality regulations and requires consideration of the context and intensity of the change that would be introduced by the project (40 CFR 1508.27). Impacts are to be discussed in proportion to their significance (40 CFR 1502.2[b]). To facilitate comparison of alternatives, the significance of environmental changes is described in terms of the temporal scale, spatial extent, and intensity.

The NEPA analysis considers the overall impact of the project to the resource, including the amount of access/activity where cultural resources are present; the amount/distribution of the ground disturbance at archaeological or historical sites; the extent to which actions alter the setting of cultural resources; the amount, quality, and location of natural resource base used by the tribes, including fish, game, plants, minerals, and springs; and the presence of cultural resource sites, including ethnographic resource and traditional cultural properties.

3.5.3.2 CEQA Impact Criteria

Under CEQA, the proposed project would have a significant impact if it would:

a. cause a substantial adverse change in the significance of a historic resource as defined in Public Resources Code Section 15064.5,

b. cause a substantial adverse change in the significance of a archaeological resource as defined in Public Resources Code Section 15064.5, or

c. disturb any human remains, including those interred outside of formal cemeteries. No quantitative threshold exists.

3.5.3.3 Methodology

Impacts to identified cultural resources were evaluated based on the significance of the site according to data presented in Sander et al. (2009). For Section 106 of the NHPA, determining significance entails determining whether a resource is eligible for listing on the NRHP. The resource is eligible if it meets one of the following four criteria:

Criterion A The resource is associated with events that have made a significant contribution to the broad patterns of American history.

Criterion B The resource is associated with the lives of persons significant in our past.

Criterion C The resource embodies the distinctive characteristic of a type, period, or method of construction; represents the work of a master; possesses high artistic value; or represents a significant or distinguishable entity whose components may lack individual distinction.

Criterion D The resource has yielded or may likely yield information important in prehistory or history.

Under CEQA, the significance of a resource is determined according to California Public Resources Code Section 5024.1 and California Code of Regulations, Title 14 Section 4850 et seq. CEQA criteria for significant resources are given below.

Criterion 1 The resource 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.

Criterion 2 The resource is associated with the lives of persons important to local, California, or national history.

Criterion 3 The resource 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.

Criterion 4 The resource has yielded, or may be likely to yield, information important in prehistory or history of the local area, California, or the nation.

Sites that are not considered to be significant resources are not protected and would be deemed to not have any impacts resulting from this project.

3.5.3.4 Applicant Proposed Measures

The applicant has included the following applicant proposed measures (APMs) related to cultural resources:

APM CR-1: Conduct Archaeological Inventory of Areas that May Be Disturbed. Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the proposed project. A complete cultural resources 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, the applicant would ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys would be conducted and documented according to applicable laws, regulations, and professional standards.

APM CR-2: Avoid and Minimize Impacts on Significant Cultural Resources Wherever Feasible. Avoid and minimize impacts on significant or potentially significant cultural resources wherever feasible. To the extent practical, the applicant would avoid or minimize impacts on archaeological resources, regardless of its CRHR or NRHP eligibility status. This includes siting all ground-disturbing activities and other project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the right-of-way.

APM CR-2a. Avoid Direct Impacts on Significant Cultural Resources through Project Final Design. Project Final Design would avoid direct impacts on significant or potentially significant cultural resources. To the extent practical, all ground-disturbing activities and other project components would be sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.

APM CR-2b. Conduct a Preconstruction Worker Environmental Awareness Program (see BIO-6, PALEO-3, and W-11). The program would be presented to 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 would be involved in ground-disturbing activities without having participated in the Worker Environmental Awareness Program.

APM CR-2c. Protective Buffer Zones. Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the right-of-way. A protective buffer zone would be established around each recorded archaeological site and treated as an "environmentally sensitive area" within which construction activities and personnel are not permitted. Monitoring would be conducted to ensure that the protective areas are maintained.

APM CR-3. Evaluate Significance of Unavoidable Cultural Resources. 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 would be evaluated to determine their historical significance. Evaluation studies would be conducted and documented according to applicable laws, regulations, guidelines, and professional standards.

APM CR-3a. Evaluate Significance of Potentially Eligible Archaeological Resources. Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing. Evaluation of archaeological sites could 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 would be evaluated to consider their eligibility per CRHR Criterion 1 and NRHP Criteria A, C, and D.

APM CR-3b. Evaluate Significance of Potentially Eligible Buildings and Structures. Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation would take into account engineering, aesthetic, architectural, and other relevant attributes of each property. Buildings and structures would 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 would be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. The report would be filed with the appropriate Information Center of the California Historical Resources Information System.

APM CR-3c. Assist with Native American Consultations. If necessary, the applicant would assist BLM in consultations with Native Americans regarding traditional cultural values that may be associated ~~with archaeological resources.~~with locations within the APE. Archaeological or other cultural resources associated with the project may have cultural values ascribed to them by Native Americans. The applicant would assist the BLM during consultation with Native Americans regarding Native American cultural remains.

APM CR-4. Minimize Unavoidable Impacts on Significant Cultural Resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties. The applicant would 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 on significant cultural resources. Impacts on significant cultural resources would be minimized by implementing the measures listed in APM CR-4a.

APM CR-4a. Implement Measures to Minimize Impacts on Significant Archaeological Sites. Prior to construction and during construction, the following measures would be implemented by the applicant to minimize unavoidable impacts on significant archaeological sites:

- To the extent practical, all activities would minimize ground surface disturbance within the bounds of significant archaeological sites, historical resources, or historic properties.
- Portions of significant archaeological sites, historical resources, or historic properties that can be avoided would be protected as environmentally sensitive areas and would remain undisturbed by construction activities.
- Monitoring by qualified professionals and/or Native Americans to ensure that impacts on sites are minimized would 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 would be carried out at appropriate sites to ascertain whether project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials.
- If impacts on significant archaeological (NRHP- or CRHR-eligible) sites eligible under NRHP Criterion D or CRHR Criterion 4 cannot be avoided, archaeological data recovery would be carried out in the portions of affected significant sites that would be impacted. A data recovery plan would 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 eligibility research questions for CRHR Criterion 4 or NRHP Criterion D. Archaeological data recovery would 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 would be filed with the BLM and the appropriate Information Center of the California Historical Resources Information System.

APM CR-4b. Implement Measures to Minimize Impacts on Significant Buildings and Structures. Prior to construction and during construction, the applicant would implement the following measures to minimize unavoidable impacts on significant buildings and structures:

- Locate proposed project facilities to minimize effects on significant buildings or structures.
- If impacts on significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with the documentation standards of the National Park Service Historic American Buildings Survey/Historic American Engineering Record.
- File reports and other documentation with the BLM, the National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.

APM 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, the applicant would prepare a

Construction Monitoring and Unanticipated Cultural Resources Discovery Plan to be implemented if an unanticipated discovery is made. At a minimum the plan would detail the following elements:

- Worker and supervisor training in the identification of cultural remains that could be found in the proposed project area, and the implications of disturbance and collection of cultural resources pursuant with the Archaeological Resources Protection Act of 1979
- 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 about the potential significance of any find
- Identities of persons authorized to stop or redirect work that could affect the discovery, and their on-call contact information
- Procedures for monitoring construction activities in archaeologically sensitive areas
- A minimum radius around any discovery within which work would 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 a discovery
- Procedures for consulting Native Americans when identifying and evaluating the significance of discoveries involving Native American cultural materials
- Procedures to be followed for treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans

APM CR-6. Inadvertent Discovery of Human Remains. Any human remains discovered during project activities in California would 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 would be treated under the appropriate State of Nevada statutes, including but not limited to Nevada Revised Statutes Chapter 440 and the regulations of the applicable land management agency. In the event that human remains are recovered on private lands, the landholder would have the right to designate the 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 are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains would be treated as defined in the Construction Monitoring and Unanticipated Cultural Resources Discovery Plan.

APM CR-7. Native American Participation. Prior to construction, BLM would consult with Native Americans identified by the NAHC as having cultural ties to particular areas of the proposed project. Native Americans would be invited to participate in significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, as well as in monitoring during project construction. Native Americans would be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during project activities.

3.5.3.5 Proposed Project / Proposed Action

Construction

Construction of the EITP would impact cultural resources because of surface and subsurface ground disturbance. This disturbance would result from new road construction, parking in areas off prepared roads, creation and use of temporary laydown areas, and drilling and leveling during construction of tower footings. Cultural resources identified in Sander et al. (2009) and the nature of the potential impact to the resource, if any, by the project are discussed below.

Eldorado–Ivanpah Transmission Line

36-1910 (CA-SBR-1910H)/26CK5685: ~~Although the~~ The historic Union Pacific Railroad is eligible for listing on the NRHP~~,~~ under criteria A and D; however, the portions of the resource that are within the EITP ROW would not be adversely affected. ~~have already been impacted by upgrades and have therefore been found to be noncontributing elements to the resource.~~ Construction of the proposed route would thus have no adverse impact.

36-7694 (CA-SBR-7694)/26CK4957: The LADWP Boulder Transmission Line was determined eligible for the NRHP in 1994. ~~The applicant intends to span over the line using H-frame towers, which would allow the EITP line to cross the historic LADWP line without impacting it. Any disturbance or destruction of the contributing elements to this resource would result in an impact.~~The transmission line would not be altered by the project since the proposed line would be engineered at the crossing locations to avoid this resource. All measures of APM CR-2 would help ensure that adverse effects/impacts would be avoided or minimized.

36-10315 (CA-SBR-10315H): The Boulder Dam–San Bernardino 132-kV Transmission Line has been determined to be eligible for the NRHP and would be impacted by the EITP because towers from this line would be removed and replaced with new towers to accommodate the existing and new transmission capacities. While this impact could not be avoided, the impact would be reduced by APM CR-4b, which would require that the resource be fully recorded before adverse impacts were made.

36-6835 (CA-SBR-6835H): The Von Schmidt Survey Line is represented on the ground by a series of cast-iron markers~~; however, none~~and has been recommended as eligible for the NRHP. None of ~~these~~ the markers is located within, or would be impacted by, the EITP; therefore, the EITP would not result in any adverse impacts to this resource.

36-7689 (CA-SBR-7689H): The Arrowhead Trail Highway is not recommended as eligible for the NRHP due to upgrades and other impacts to the site. A portion of the ROW in nearby Baker was also previously determined to be not eligible for similar reasons. As the site is not a significant resource, ~~the EITP would not have~~ any ~~impacts~~effects on the ~~resources~~ site would be less than significant.

36-13416 (CA-SBR-12574H): The remains of a telecommunications system that served the Boulder Dam Transmission line lack integrity because the line and telegraph poles have been cut down. This site has been recommended not eligible for the NRHP~~, so the EITP would not result in~~ ; therefore, any impacts to ~~this resource~~the site would be less than significant.

36-13417 (CA-SBR-12575H): The unnamed two-track road that appears to be a route from Yates Well to Ivanpah Springs does not meet the criteria for listing on the NRHP; therefore, any effects on the ~~EITP~~site would ~~not result in any impacts to this resource~~be less than significant.

26CK2633: The prehistoric lithic scatter, which contained debitage, one projectile point, and two biface fragments, has ~~not~~ been evaluated for eligibility to be listed on the NRHP and recommended to be not eligible.~~; however, the applicant plans to avoid this site entirely.~~ Therefore, ~~the EITP would not result in adverse~~any impacts would be less than significant. ~~on this resource. APMs CR-2, CR-2b, and CR-2c would also help ensure there would be no adverse impacts.~~

26CK3023(CRNV-53-4280): The small, east-facing natural rock shelter in the McCullough Range, which contains metate fragments, potsherds, chert flakes, a single petroglyph, and a basalt chopper, ~~has been~~was previously determined ~~not~~ eligible for listing on the NRHP~~. Therefore, the EITP would not result in any impacts on this resource~~ and was subject to data recovery in 1983. The data recovery excavations have resulted in the site no longer being considered eligible for the NRHP; therefore, any effects on the site would be less than significant.

Telecommunications Line

36-014987 (CA-SBR-13132H): The historic trash scatter containing cans manufactured in the 1950s likely represents a single episode of dumping and is recommended as not eligible for the NRHP. ~~Therefore, the EITP would not result in any impacts to this resource~~ Therefore, any effects on the site would be less than significant.

36-014988 (CA-SBR-13133H): The historic trash mound containing charcoal, cinders, rock debris, modern glass, ceramics, metal fragments, and sun-colored amethyst glass fragments has been disturbed by relic hunters and is a dump of domestic refuse that likely originated in the nearby community of Nipton. The site is recommended as not eligible for the NRHP; therefore, any effects on the ~~EITP~~site would ~~not result in any impacts to this resource~~be less than significant.

Additional Survey of 245 Acres for Proposed Spur Roads, Two Helicopter Landing Zones, and Laydown Areas

Hel-1 is a historic can scatter located in Landing Zone 5. The site consists of 13 historic cans, which may date to the construction of Boulder Dam. It has been recommended to be not eligible for the NRHP; therefore, any impacts to the site would be less than significant. Hel-2 is a prehistoric ceramic scatter that consists of two prehistoric pottery sherds. It has been recommended to be not eligible for the NRHP; therefore, any impacts to the site would be less than significant.

Table 3.5-1 lists EITP cultural resources NRHP eligibility and impacts.

Table 3.5-1 EITP Cultural Resources NRHP Eligibility and Impacts

Site Number	Resource Description	NRHP Eligibility Determination or Recommendation*	Impacts
36-1910 (CA-SBR-1910H)/26CK5685	Union Pacific Railroad	Eligible	No significant impact. No modifications to the resource would be made for construction of the EITP
36-7694 (CA-SBR-7694)/26CK4957	LADWP Boulder Transmission Line	Eligible	No significant impact. No modifications to the resource would be made for construction of the EITP
36-10315 (CA-SBR-10315H)	Boulder Dam–San Bernardino 132-kV Transmission Line	Eligible	Project would have a significant impact to the site; however, APM CR-4b would reduce the impact to a level less than significant
36-6835 (CA-SBR-6835H)	Von Schmidt Survey Line	Eligible	No significant impact. No modifications to the resource would be made for construction of the EITP
36-7689 (CA-SBR-7689H)	Arrowhead Trail Highway	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
36-13416 (CA-SBR-12574H)	Telecommunications System	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant

Table 3.5-1 EITP Cultural Resources NRHP Eligibility and Impacts

Site Number	Resource Description	NRHP Eligibility Determination or Recommendation*	Impacts
36-13417 (CA-SBR-12575H)	Unnamed Two-Track Road	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
26CK2633	Prehistoric Lithic Scatter	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
26CK3023(CRNV-53-4280)	Rock Shelter	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
36-014987 (CA-SBR-13132H)	Historic Trash Scatter	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
36-014988 (CA-SBR-13133H)	Historic Trash Mound	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
Hel-1	Historic Can Scatter	Not Eligible	Since the resource has been recommended as not eligible for the NRHP, any impacts would be less than significant
Hel-2	Prehistoric Ceramic Scatter	Not Eligible	Since the resource has been recommended as not for the NRHP, any impacts would be less than significant

Note:
*-Since the CRHR eligibility criteria are similar to the NRHP criteria, the sites have not been assessed separately for eligibility.
Key:
kV = kilovolt
LADWP = Los Angeles Department of Water and Power
NRHP = National Register of Historic Places

Potential for Undiscovered Cultural Resources

Assessing potential impacts to undiscovered cultural resources requires an evaluation of the sediment deposition for the project area. The sediments that could contain cultural resources throughout the proposed project ROW have been summarized below from the geology report (SCE 2009).

Eldorado–Ivanpah Transmission Line

The EITP from the McCullough Mountains to the Ivanpah Substation would cross active alluvial washes (Qaag), young playa and playa fringe sediments (Qap, Qapf, and Qypf), young and older-young alluvial fans (Qyag, Qya, Qyao, and Qyaog), young aeolian deposits (Qyae and Qye), and intermediate alluvial fan deposits (Qia and Qiag). Qia fans typically have poorly to moderately well developed desert pavement with desert varnish. The sediments crossed by this portion of the EITP have the potential for buried, and therefore previously unidentified, cultural resources or human remains, including those interred outside of formal cemeteries. ~~Cultural~~Although unlikely, previously unidentified cultural resources may also be discovered on the surface of these sediments during construction due to the rapidly changing soil surface of the general project area.

At the McCullough Mountains, the EITP would cross a short section of intermediate alluvial fan (Qia) deposits with some areas of mixed Qya; these sediments have the potential for buried, and therefore previously unidentified, cultural resources or human remains, including those interred outside of formal cemeteries. Cultural resources may also be discovered on the surface of these sediments. The rest of this segment passes over colluvial deposits and exposed bedrock of volcanic origin that has low potential for buried cultural resources or human remains, including those interred outside of formal cemeteries~~; however,~~. Although unlikely, previously unidentified cultural resources may also be discovered on the surface of these sediments~~.~~ during construction due to the rapidly changing soil surface of the general project area.

From Eldorado to the McCullough Mountains, the EITP would cross alluvial deposits consisting of young axial valley (Qyv), young alluvial fans (Qya), and intermediate alluvial fans (Qia), with some areas of mixed Qya and Qia. Qia has poorly to moderately developed desert pavement and desert varnish. The sediments crossed by this portion of the EITP have been determined to have the potential for buried, and therefore previously unidentified, cultural resources or human remains, including those interred outside of formal cemeteries. ~~Cultural~~Although unlikely, previously unidentified cultural resources may also be discovered on the surface of these sediments during construction due to the rapidly changing soil surface of the general project area.

Ivanpah Substation

Grading and cut-and-fill for construction of the Ivanpah Substation would disturb approximately 19 acres. The sediments characterized for the substation location include young and older-young alluvial fans (Qyag and Qyao). No data were given on the depth of these sediments. Qyag and Qyao sediments are of an age that could yield subsurface cultural resources. ~~Cultural~~Although unlikely, previously unidentified cultural resources may also be discovered on the surface of these sediments during construction due to the rapidly changing soil surface of the general project area.

Telecommunications Line

The on-land portion of the proposed telecommunications line traverses land that has poor to moderately well developed desert pavement with desert varnish and that has the potential for buried, and therefore previously unidentified, cultural resources or human remains, including those interred outside of formal cemeteries. Although unlikely, previously unidentified cultural resources may also be discovered on the surface of these sediments during construction due to the rapidly changing soil surface of the general project area.

Operation and Maintenance

Operation and maintenance of the proposed project should not further disturb the ground. No impacts are expected from these activities.

NEPA Summary

Construction of the EITP would result in a direct, adverse, and permanent impact to Cultural Resource~~s~~ 36-10315 (CA-SBR-10315H) ~~and 36-7694 (CA-SBR-7694H)/26CK4957~~ by altering the setting and disturbing elements of the site that contribute to its historic significance. The construction plans call for removal of portions of historic resources; however, as discussed under mitigation measure (MM) CR-2, the resources would be documented according to Historic American Engineering Record (HAER) level 2 standards and potential impacts would be minimized or reduced to less than significant. A Programmatic Agreement has been signed between the California BLM, California SHPO, Nevada BLM and Nevada SHPO to outline treatment and recordation standards of any impacts to 36-10315 and other similar resources (BLM 2010).

Additionally, the proposed project could result in impacts on human remains if there were unanticipated discoveries of human remains during construction. The applicant would reduce impacts on human remains by following the steps outlined in APM CR-6. Finally, the sediments discussed above have the potential to contain buried, and therefore previously unidentified, cultural resources. Such an unanticipated cultural resource could be impacted, as the disturbance could diminish its scientific or cultural integrity. The applicant would reduce such impacts through APMs CR-5 and CR-6. Implementation of MM CR-1 would reduce potential impacts to minor levels.

CEQA Significance Determinations

IMPACT CR-1: Impacts to Cultural Resource~~s~~ 36-10315 (CA-SBR-10315H) ~~and 36-7694 (CA-SBR-7694H/26CK4957~~
ess than signifi ant itho t itigation

The proposed project would result in significant adverse ~~-~~permanent impacts to cultural resources under CEQA if it would cause a substantial ~~adverse~~ change in the significance of a historic resource as defined in California Public Resources Code Section 15064.5. APM CR-1 has been conducted to identify the extent of resources in the proposed project area. APM CR-2 would reduce impacts by avoiding the resources to take care that contributing elements to the resources would not be damaged or destroyed. APM CR-3b would determine the significance of a resource to help determine whether, and how much, mitigation would be necessary (this has not yet been done for the Nevada portions of 36-10315). APM CR-4b would help minimize impacts on resources and would require documentation of the resource according to the National Park Service Historic American Buildings Survey/Historic American Engineering Record standards. This documentation would be filed with the California Historical Resources Information System, the Nevada State Historic Preservation Office, and the BLM. Therefore, impacts under this criterion would be less than significant without mitigation.

IMPACT CR-2: Impacts to Previously Unidentified Cultural Resources
ess than signifi ant ith itigation

The sediments discussed above have the potential for buried, and therefore previously unidentified, cultural resources. If any subsurface cultural resources were discovered, major long-term direct impacts to these resources would result from disturbing the ground and altering the setting of the site, as well as disturbing the context of the find and its associations with other resources in the area. This disturbance would diminish the resource's scientific or cultural integrity. Under CEQA, the impact would result from causing a substantial change in the significance of an archaeological resource as defined in Public Resources Code Section 15064.5.

Implementation of MM CR-1 (Cultural Resources Monitoring), MM CR-3 (Archaeological Resources Protection Act Training), APM CR-5 and APM CR-6 would reduce these potential impacts to less than significant levels by requiring an onsite cultural resources monitor who would be able to stop work in an area of a find immediately, thereby limiting the amount of disturbance of the resource, and requiring all construction personnel to understand the federal requirements and implications of unauthorized treatment of archaeological resources. Additionally, implementation of APM CR-2b would reduce these potential impacts to less than significant levels by educating the construction crew on the penalties associated with not reporting a cultural find or of collecting artifacts from federal- or state-controlled land.

IMPACT CR-3: Unanticipated Discovery of Human Remains
ess than signifi ant itho t itigation

The proposed project could result in a major long-term direct impact on human remains if there were unanticipated discoveries of human remains during construction. Impacts would result from causing a substantial change in the significance of an archaeological resource as defined in Public Resources Code Section 15064.5. Although no resources with human remains or features known to be likely to contain human remains were discovered during the background research or field studies for the EITP, an APM has been written to account for inadvertent discoveries. APM CR-6 would reduce impacts on human remains because it would require the remains to be secured until appropriate authorities had been called, consultations conducted, and treatment decided.

3.5.3.6 No Project / No Action Alternative

Cultural resources are impacted by any form of ground disturbance, construction on or nearby the resource, demolition of the resource, or other forms of alteration of the resource's setting. Since the No Project Alternative would not involve any construction, demolition, or ground disturbance, there would be no impact to cultural resources.

3.5.3.7 Transmission Alternative Route A

No previously recorded cultural resources were located during the pre-field research, and no newly discovered cultural resources were found during the field survey for Transmission Alternative Route A. Due to the lack of known cultural resources, there would be no impacts to them.

Alternative A crosses active alluvial washes (Qaa), young alluvial fans (Qya), and intermediate alluvial fan (Qia) deposits with some areas of mixed Qya. Qia areas typically have poorly to moderately well developed desert pavement with desert varnish. These sediments have been determined to have the potential for buried, and therefore previously unidentified, cultural resources or human remains, including those interred outside of formal cemeteries. If any subsurface cultural resources or human remains were discovered, it would result in Impacts CR-2 and CR-3 as described above under the proposed project. Impact CR-3 would be less than significant without mitigation. Implementation of MM CR-1 would reduce Impact CR-2 to less than significant levels. Therefore, with mitigation, Transmission Alternative Route A would result in less than significant, negligible impacts.

3.5.3.8 Transmission Alternative Route B

No previously recorded cultural resources were located during the pre-field research, and no newly discovered cultural resources were found during the field survey of Transmission Alternative Route B. Due to the lack of known cultural resources, there would be no impacts to them.

Alternative B has young alluvial fans, mixed active alluvial washes, axial valley alluvium, and young alluvial fans overlying intermediate alluvial fan deposits. The areas with Qya/Qia deposits exhibit patchy, poorly to moderately well developed desert pavement with desert varnish. These sediments have the potential for buried, and therefore previously unidentified, cultural resources or human remains, including those interred outside of formal cemeteries. Discovery of any subsurface cultural resources or human remains would result in Impacts CR-2 and CR-3 as described above under the proposed project. Impact CR-3 would be less than significant without mitigation. Implementation of MM CR-1 would reduce Impact CR-2 to less than significant levels. Therefore, with mitigation, Transmission Alternative Route B would result in less than significant, negligible impacts.

3.5.3.9 Transmission Alternative Route C

This alternative would result in significant adverse permanent impacts to 36-10315 (CA-SBR-10315H) and 36-7694 (CA-SBR-7694H)/26CK4957 as described above under the proposed project by altering the setting and disturbing the elements contributing to the historic significance of the sites. Such impacts would be direct, ~~adverse,~~ and permanent. APMs CR-1, CR-2, CR-3b, and CR-4b would reduce the impact. There would be no impacts to cultural sites 36-7689 (CA-SBR-7689H) (because it is not recommended for the NRHP) or 26CK4135 (because it is not eligible for the NRHP). The proposed project might result in impacts on human remains, if there were unanticipated discoveries of human remains during construction. Implementation of APM CR-6 would reduce impacts.

Additionally, Alternative C contains the same sediments discussed above under the proposed project, which have the potential for buried, and therefore previously unidentified, cultural resources. Discovery of a subsurface cultural resource could impact the resource because the disturbance could diminish its scientific or cultural integrity.

Implementation of MM CR-1 would reduce these potential impacts to less than significant. Therefore, with mitigation, Transmission Alternative Route C would result in less than significant, negligible impacts.

3.5.3.10 Transmission Alternative Route D and Subalternative E

Construction of Transmission Alternative Route D would not result in an impact to cultural resource 36-13416 (CA-SBR-12574H) because this site has been recommended not eligible for the NRHP. However, because the line is associated with the Boulder Transmission Line, it will be included with the Historic American Engineering Record assessment for that line. Subalternative E contains no previously recorded cultural resource, and no cultural resource was discovered during the field survey for this Subalternative; therefore, no impacts to known cultural resources would occur.

Alternative D and Subalternative E cross young playa/lake bed and playa fringe sediments, and young and older-young alluvial fans and young Aeolian deposits. These sediments have the potential for buried, and therefore previously unidentified, cultural resources. Discovery of subsurface cultural resources or human remains would result in Impacts CR-2 and CR-3 as described above under the proposed project. Impact CR-3 would be less than significant without mitigation. Implementation of MM CR-1 would reduce Impact CR-2 to less than significant. Therefore, with mitigation, Transmission Alternative Route D and Subalternative E would result in less than significant, negligible impacts.

3.5.3.11 Telecommunication Alternative (Golf Course)

The construction of the Golf Course Telecommunication Alternative would not likely result in impacts to cultural resource 36-3048 (CA-SBR-3048H) because the portions of the resource that might be affected by the proposed project development are not recommended as contributing elements of the resource. Likewise, there would be likely be no impacts to cultural resources 36-7802 (CA-SBR-7802H) and 36-014496 (CA-SBR-12980H)) because the sites are recommended not eligible for the NRHP due to disturbances associated with modern upgrades and maintenance, such as road paving. Cultural ~~resource~~ Resource 36-1910 (CA-SBR-1910H)/26CK5685 would also not be impacted by the proposed project because the site would be spanned. ~~short sections located within the project corridor are not recommended as contributing elements of the structure.~~ Regular maintenance and upgrades have replaced the original historic materials, and only the original path of the railroad remains.

The Golf Course Telecommunication Alternative crosses sediments described as younger alluvial deposits with no mention of desert pavement. These sediments have the potential for buried, and therefore previously unidentified, cultural resources. Discovery of any subsurface cultural resources or human remains would result in Impacts CR-2 and CR-3 as described above under the proposed project. Impact CR-3 would be less than significant without mitigation. Implementation of MM CR-1 would reduce Impact CR-2 to less than significant. Therefore, with mitigation, the Golf Course Telecommunication Alternative would result in less than significant, negligible impacts.

3.5.3.12 Telecommunication Alternative (Mountain Pass)

Construction of the Mountain Pass Telecommunication Alternative would not ~~likely~~ result in impacts to ~~cultural~~ Cultural ~~resources~~ Resources 36-014497 (CA-SBR-12981H), or 36-014498 (CA-SBR-12982H) because these sites ~~appear~~have been recommended as ineligible for inclusion in the NRHP (Sander and Auck 2009).~~, pending formal evaluation.~~ Impacts to ~~cultural resource~~ Cultural Resource 36-7347 (CA-SBR-7347H) ~~are unknown because~~would result in no ~~NRHP determinations have yet been made~~impacts, as the site does not meet any of the criteria for inclusion on the ~~resource~~NRHP.

This alternative crosses sediments described as younger alluvial deposits with no mention of desert pavement**.** These sediments have the potential for buried, and therefore previously unidentified, cultural resources or human remains. If any subsurface cultural resources or human remains were discovered, impacts to these resources would result that could diminish their scientific or cultural integrity. Implementation of MM CR-1 would reduce these potential impacts to less than significant. Therefore, with mitigation, the Mountain Pass Telecommunication Alternative would result in less than significant, negligible impacts.

3.5.3.13 Additional Survey of 245 Acres for Proposed Spur Roads, Two Helicopter Landing Zones, and Laydown Areas

The construction of spur roads, helicopter landing zones, and laydown areas may result in impacts to Cultural Resources Hel-1 and Hel-2. The sites have been recommended as not eligible for the NRHP (Becker 2010).

3.5.4 Mitigation Measures

MM CR-1: Cultural Resources Monitoring. The applicant will retain a cultural resources monitor who meets the Secretary of the Interior Standards of a Qualified Professional Archaeologist prior to commencing construction or geotechnical test trenching on the project. The archaeologist will need to be approved by the BLM and will provide construction monitoring for any geotechnical studies that require trench excavation. As mentioned in APM GEO-1, five of the tower installations and 20 percent of the ground-trenching activities are in archaeologically sensitive areas. Monitoring in these areas will be determined by the BLM prior to construction.

Monitoring is necessary because a potential for cultural resources beneath desert pavement surfaces on alluvial planes was recently determined. Such conditions exist throughout much of the EITP project area. This monitoring effort would be used to protect potential resources and to provide data to help confirm or deny the theory of desert pavement development that would allow for buried cultural resources. BLM reserves the right to increase the amount of monitoring at any time if conditions reveal the necessity.

The archaeologist will present to the BLM for approval, no less than 60 days prior to commencement of construction, a monitoring plan; copies of which will also be submitted to the CPUC by the archaeologist. The archaeologist will also provide a report of findings after the monitoring has been completed. Because this geoarchaeological sensitivity has not been widely tested, the BLM is requiring only a small sample of monitoring at this time; further monitoring will only be required if the need is proven.

MM CR-2: Historic American Engineering Record Recordation. Prior to construction of the EITP, the applicant will retain a cultural resources specialist qualified to conduct HAER recordation, meeting the Secretary of the Interior Standards. The qualified cultural resources specialist will conduct HAER recordation on Cultural Resource~~s~~ 36-10315 (CA-SBR-10315H~~) and 36-7694 (CA-SBR-7694H)/26CK4957.~~). HAER recordation will be conducted in accordance the Secretary of the Interior's Standards for Architectural and Engineering Documentation, following Documentation Criteria Level II, as appropriate, for the level of significance assigned to the resources.

MM CR-3: Archaeological Resources Protection Act (ARPA) Training. Prior to construction, the applicant will provide ARPA training with the preconstruction Worker Environmental Awareness Program (WEAP; APM CR-2b). As required for the WEAP, ARPA training will be presented to 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 NRHP. This includes construction supervisors as well as field construction personnel. No construction worker would be involved in ground-disturbing activities without having participated in the ARPA training portion of the WEAP.

3.5.5 Whole of the Action / Cumulative Action

~~Below is a brief summary of information related to cultural resources in the ISEGS FSA/DEIS prepared by the CEC and the BLM. This section focuses on differences in setting and methodology and discloses any additional impacts or mitigation as imposed by the CEC and the BLM.~~

Information on cultural resources related to the ISEGS project is summarized below. The setting for the ISEGS project is described, followed by a description of methodologies used and summaries of the impact conclusions presented in the CEC's Final Staff Assessment (FSA), FSA Addendum, and Final Decision and the BLM's Final Environmental Impact Statement (EIS). Required mitigation measures / conditions of certification are listed.

3.5.5.1 ISEGS Setting

The ISEGS project is located on the bajada that overlooks the western side of the Ivanpah dry lake bed. ~~Although the~~ The lake ~~bed is dry now, its~~ bed's presence ~~testifies to a~~ indicates much ~~more humid time~~greater humidity around the end of the Pleistocene. ~~Throughout the Holocene, the project area became more and more arid, causing the evaporation of Ivanpah and many other~~ Aridity increased throughout the Holocene. The lakes in the area~~. The lakes~~ have been fully desiccated since the end of the mid-Holocene ~~Altithermal~~altithermal at approximately 5,000 BP. ~~The climate in the Mojave since the Altithermal has been more mesic, with likely wet~~Wet periods ~~happening~~have likely occurred at least twice between 5,000 BP and EuroAmerican discovery of the area.

The ground surface of the project area ~~is characterized by~~ consists of patches of desert pavement of ~~varying~~various ages interspersed with intermittent stream channels.

~~3.5.5.2 Methodology~~Applicable Laws, Regulations, and Standards

The national and California laws, regulations, and standards for cultural resources that would apply to the EITP would also apply to the ISEGS project. Since ISEGS would be developed entirely within California on BLM land, any Nevada regulations associated with the EITP would not apply.

3.5.5.2 ISEGS Methodology

CEC FSA Methodology

The CEC's Final Decision explains the CEQA requirements used for analyzing ISEGS project impacts to cultural resources: whether the project would impact a "historical resource," and whether the impact would cause a substantial adverse change. The analysis ~~began~~followed the steps required by CEQA, which include developing an inventory involving background research, Native American consultation, primary field research, and evaluation of significance of found cultural resources.

BLM FEIS Methodology

The BLM Final EIS describes the ISEGS project analysis, beginning with data collection and Native American consultation, primary field research, and evaluation of cultural resources ~~evaluation~~ for historical significance. The area analyzed included the ~~immediate~~ project ~~footprint,~~ area and the area ~~that encompasses the project site and ancillary facilities, and the~~ surrounding ~~area~~it that ~~may~~could be impacted visually by the project.

The background research for the ISEGS project included a literature and records search at the San Bernardino Archaeological Information Center and at the BLM Needles Field Office, ~~which has accumulated data on known cultural resources in the project area. A request was also made to the NAHC to conduct~~as well as a search ~~of the Sacred Lands File to determine whether there are any reported Native American sacred sites in the project area, and to request a list of~~ by the California NAHC of its SLF for Native American ~~contacts who may have knowledge about or concerns related to~~ cultural resources in the immediate project area.

The ISEGS cultural consultant, CH2M Hill, sent ~~out~~ letters to ~~the~~ a Native American contact list provided by the NAHC to elicit comment ~~from the Native American community. In October 2007,~~. The BLM sent letters to potentially affected tribes to initiate the government-to-government Section 106 Consultation procedures~~. A~~ , and sent a follow-up letter ~~was sent by BLM in March 2009~~ to inform the tribes of the discovery of a cultural resources site (ISEGS-01) during the pedestrian survey.

Cultural resources fieldwork conducted for the ISEGS project included five separate field investigations~~. These included~~: a geoarchaeological study~~ (CH2M Hill and Carrier 2008), ~~, a primary intensive pedestrian cultural resources survey and supplemental intensive pedestrian cultural resources surveys~~ (Fergusson 2007)~~, a pedestrian reconnaissance survey of project area inselbergs~~ (Energy Commission Staff field notes)~~, and a helicopter and pedestrian reconnaissance survey~~ (Helton 2008, Lawson et al. 2008)~~. All ~~of~~ the cultural resources found within the impact areas of the project site were evaluated for their eligibility to be listed on ~~both~~ the CRHR ~~and~~ or the NRHP.

3.5.5.3 ISEGS Impacts

CEC Impact Conclusions

The CEC ~~has published the following impacts related to cultural resources for~~FSA states that, without mitigation, the ISEGS project~~:~~

~~One~~ would have a cumulatively considerable effect and would contribute to a significant cumulative effect on the one known cultural resource on the ~~ISEGS~~ project site, CA-SBR-10315H (the ~~Boulder~~Hoover Dam to San Bernardino Transmission Line~~), has been determined~~ , now known as the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line), which is eligible for the NRHP~~,~~ and is listed on the CRHR. ~~The potential effects of the project on the resource would be cumulative rather than direct or indirect. Analysis of the impact determined that the ISEGS project would be responsible for partial (approximately 21%) destruction of the resource. Conditions of Certification~~ However, conditions of certification CUL-8 and -9 ~~were crafted to offset~~would reduce these effects~~.~~

~~3.5.5.4 Mitigation Measures~~

~~The ISEGS FSA/DEIS recommends that the following Conditions of Certification be required by the CEC and the BLM to lessen impacts to cultural resources if the~~ to less than cumulatively considerable, so that the ISEGS project ~~is approved:~~would not have significant impacts on known cultural resources. In addition, while concluding that finding archaeological sites during ground disturbance would be "highly improbable," the FSA states that CUL-1 through CUL-7 and CUL-10 would reduce any impacts on such resources to less than significant. The CEC Addendum indicates that, for Cultural Resources and Native American Values, the ISEGS project would comply with LORS and that direct, indirect, and cumulative impacts would be fully mitigated.

~~**CUL-1** calls for the project owner to retain the services of a Cultural Resources Specialist (CRS) to manage the project and oversee any Cultural Resources Monitors that may be required during project construction~~The Final Decision does not dispute structural and cultural evidence related to human development in the project vicinity provided elsewhere, agreeing that historic use was marginal and Native American use was transitory. The Final Decision indicates one new archaeological resource (ISEGS-01), no ethnographic resources, and three built-environment resources. The Presiding Members stated concurrence with the conclusion that there was no basis to consider ISEGS-01 or two of the built-environment resources historically or culturally significant. The third built-environment resource is CA-SBR-10315H, discussed above. The Final Decision states that construction and operation would not directly or indirectly impact CRHR- or NRHP-eligible archeological or ethnographic resources because none are known to exist on the project site or in the project area, agrees with conclusions on cumulative impacts to CA-SBR-10315H, and concurs that the mitigating effects of the conditions of certification would ensure that any direct, indirect, or cumulative adverse impacts would be insignificant. The project's contribution to regional effects could be cumulatively considerable, but because other projects would reduce contributions through project planning and mitigation and any unknown cultural resources discovered would be protected, ISEGS project contributions would be negligible, according to the Final Decision.

~~**CUL-2** requires that all documentation pertaining to the development plans and maps be provided to the CRS for review, and that the CRS consult on a weekly basis with the construction manager to confirm which areas will be worked on in the following week.~~

BLM Impact Conclusions

Construction Impacts

The Final EIS determined that construction activities would be unlikely to disturb NRHP-eligible resources, since surveys have identified few such resources. Mitigation measures would effectively protect previously unidentified resources. The Mitigated Ivanpah 3 Alternative would reduce disturbed acreage by 12.5% and remove the area of the most intense site disturbance and grading from development, thus reducing the number of resources that might be impacted.

Operational Impacts

The Final EIS states that because any disturbance would have occurred during construction, operations would not have an adverse impact on cultural resources.

Decommissioning Impacts

While decommissioning could impact previously undisturbed resources, the Final EIS states that the potential for this would be low.

3.5.5.4 ISEGS Conditions of Certification / Mitigation Measures

CEC Conditions of Certification

The CEC FSA contains the conditions of certification for cultural resources listed below.

CUL-1 requires retention of an approved cultural resources specialist (CRS) and cultural resources monitors, if needed, and specifies their required background and duties. Duties include determining whether any cultural resources discovered may be eligible for registering on the NRHP or CRHR.

CUL-2 requires the project owner to give the CRS copies of the AFC, data responses, cultural resources reports, maps, and drawings, and specifies details such as scales and timing of the provisions and meetings between the CRS and the construction manager.

CUL-3 requires that the CRS prepare and submit a Cultural Resources Monitoring and Mitigation Plan to the BLM for review and approval prior to the start of ground disturbance.

CUL-4 requires that the CRS prepare a Cultural Resources Report to the BLM at the conclusion or major suspension of ground-disturbing or construction activities. The report is to summarize all field methods, findings, sampling, and analyses undertaken as a result of monitoring finds.

CUL-5 requires that the project owner provide a Worker Environmental Awareness Program training session to all new workers within their first week of employment at the project site.

CUL-6 requires that construction and ground-disturbing activities cease in the area around any discovery of cultural resources. The CRS must be immediately notified of the find and will evaluate the NRHP and CRHR eligibility of the find.

CUL-7 establishes that monitoring may be necessary in certain areas of the project for continued ground-disturbing activities during project construction if a buried cultural resource is found.

CUL-8 requires that the services of an architectural historian be retained prior to any impacts to the Hoover Dam to San Bernardino transmission line (CA-SBR-10315H).

CUL-9 requires that Historic American Engineering Record (HAER) documentation be ~~conducted~~completed prior to any impacts to CA-SBR-10315H. Consultation with the HABS/HAER coordinator in the Pacific West Regional Office is required.

CUL-10 requires that any noncommercial soil borrow or disposal sites be surveyed for cultural resources prior to their use unless a survey has been done in those areas within the last five years.

BLM Mitigation Measures

The CEC conditions of certification listed above constitute the BLM mitigation measures. CUL-1 through CUL-10 are imposed by the CEC and CUL-8 and CUL-9 are required jointly by the CEC and the BLM.

3.5.6 Combined Impact of EITP and ISEGS

Cultural resources surveys of both the EITP and the ISEGS project have concluded that, although there are a number of cultural resources in areas that may be affected by the project, only one resource, SBR-CA-10315H, has been found to meet the eligibility criteria for the NRHP and/or the CRHP. This resource has been the subject of recent HAER level II documentation. As the site has been recorded to the adequacy of the BLM and California SHPO, the impact has been mitigated and no further work for known cultural resources is required.

It should be noted that sediments in some areas of both undertakings are of an age that could have buried prehistoric cultural resources. The various APMs, conditions of certification, and mitigation measures described above help to mitigate any such impacts to a level less than significant.

3.6 Geology, Soils, Minerals, and Paleontology

This section contains a description of the environmental setting, regulatory setting, and potential impacts associated with the construction and operation of the proposed project and alternatives with respect to geology, soils, minerals, and paleontology.

3.6.1 Environmental Setting

The following section presents a discussion of the geology, geologic hazards, soils, mineral resources, and paleontology in the proposed project area. Data collection for this analysis consisted of (1) identifying and collecting readily available geology, soils, mineral resources, and paleontology information from local, state, and federal agency sources~~;~~ and (2) reviewing readily available aerial images and topographic maps.

3.6.1.1 Geologic Setting

Topography

The topography within the proposed project area in Nevada ranges from an elevation ~~low~~ of less than 1,800 feet in the area of the Eldorado Substation to an elevation of approximately 5,000 feet along the redundant telecommunication line where it would cross the McCullough Mountains (California Division of Mines and Geology [CDMG] 1961). Within California, the proposed transmission line route would cross Ivanpah Dry Lake (lowest elevation approximately 2,605 feet), where it would rejoin Alternative C (at elevation approximately 2,620 feet) before continuing to the Ivanpah Substation within the alluvial fans sloping east from the Clark Mountain Range. The Mountain Pass Alternative Telecommunication Route would cross Ivanpah Dry Lake and then extend to the Mountain Pass substation, which has an elevation of just over 5,000 feet (CDMG 1961).

Regional Geology

The proposed project lies mostly within the Mojave Desert geomorphic province (Norris and Webb 1990), which is located primarily in California but extends eastward into Nevada, where it merges with the Basin and Range province (the Great Basin; Figure 3.6-1). In Nevada, the proposed project area lies within the Basin and Range province. 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. The Great Basin province is characterized by interior drainage with lakes and playas (dry lake basins) and the typical mountain and valley structure including subparallel, fault-bounded ranges separated by down-dropped basins (California Geological Survey [CGS] 2002). Extensional tectonics (a pulling apart of the earth's crust) is predominant in the Basin and Range province, although some northwest-trending right-lateral strike-slip (mostly horizontal side-to-side motion) faulting is present.

The Mojave Desert geomorphic province is a broad interior region of isolated mountain ranges separated by expanses of desert plains. It has an interior enclosed drainage with playas being common. Fault trends largely control Mojave Desert topography. Mountain ranges in the Mojave Desert geomorphic province are composed of complexly faulted and folded basement rocks that range from pre-Cambrian (greater than 570 million years before present [mybp]) to Mesozoic (66 to 240 mybp). Volcanic and sedimentary rocks deposited in the Cenozoic (less than 66 mybp to present) are common as well. Younger faulting in the eastern half of the Mojave Desert geomorphic province is characterized by generally north- to northwest-trending normal faults associated with regional extension (pulling apart) in the Basin and Range province. Normal faulting is one of the most common types, exhibiting movement along a generally non-vertical ~~plan~~ plane such that the upper part moves downward along the plane causing an offsetting of the geologic unit(s).

Geology in the Clark Mountain Range, located along the western extent of the proposed project area and eastward into Nevada, is characteristic of both the Mojave Desert and Basin and Range geomorphic provinces. The Clark Mountain Range is bounded on the west side by the Halloran Hills Detachment Fault (Fowler and Calzia 1999). Although these mountains have been subjected to considerable faulting, the core of the range has remained unaffected by stretching of the crust in this region (regional extension). The adjacent Ivanpah Valley, with a lakebed elevation of 2,605 feet, could be primarily a product of the same relatively recent regional extension and normal faulting. The McCullough Mountains to the east, however, have also been affected by this crustal extension, and very low angle (detachment) faulting that has been dated as Miocene, with an age between 16.5 and 11.0 mybp (U.S. Geological Survey [USGS] 2006). Numerous unconformities (areas where rocks of different compositional types or structural orientations are in direct contact) and major thrust faults (locations where older rocks have been pushed up and over younger rocks) are present in these mountains.

Project Site Geology

The geologic units exposed in the proposed project area occur as three types:

- Alluvium: sedimentary deposits derived from the physical and chemical breakdown and transport in the flatter valley portions of the desert plains and along the slopes of alluvial fans;
- Alluvial fans: cone-shaped accumulations of alluvial material along the bases of mountains; and
- Bedrock: igneous, metamorphic, and sedimentary rock exposed in the mountain areas, typically surrounded by alluvium and alluvial fans.

Refer to Figure 3.6-1 for a simplified geologic map of the proposed project area.

Alluvium ranges from modern (Holocene; 0 to 11,000 years old) stream deposits to early- to late-Pleistocene (11,000 to 1.8 million years old) alluvial fan deposits usually flanking the mountain ranges. Bedrock is composed of Miocene (5.3 million years before present [mybp] to 23 mybp) volcanic (igneous) rock, and basement rock is Ordovician through Precambrian (greater than 435 mybp to at least 570 mybp) metamorphic rocks.

Although the alluvial units have been extensively subdivided (Nevada Bureau of Mines and Geology [NBMG] 2006), the approach taken here is to present a more utilitarian summary based on major characteristics rather than minor variations. To this end, a summary of the exposed geologic units in the proposed project area by state is provided in Table 3.6-1 and Figure 3.6-1. The text below provides more data from more detailed data sets than those used to produce Table 3.6-1 and Figure 3.6-1.

Nevada

In Nevada, alluvium ranges from Quaternary to Tertiary (as old as 66 mybp) alluvial and rocky fragments and debris (talus) deposits, alluvial fan deposits, and flat-lying playa deposits. These deposits generally overlie and/or are marginal to bedrock units that include Tertiary (1.6 to 66 mybp) volcanic flows; Paleozoic- to Mesozoic (66 to 570 mybp) sedimentary rocks; and Precambrian (greater than 570 mybp) metamorphic rocks.

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LABEL	ROCK TYPE
C	limestone
Ca	sandstone
D	limestone
Dc	dolostone (dolomite)
J	orthoquartzite
JTRa	sandstone
K	felsic volcanic rock
Kgr	granodiorite
Mc	limestone
OCc	dolostone (dolomite)
PPc	limestone
Pc	limestone
Psc	sandstone
Q	alluvium
QToa	alluvium
Qa	alluvium
Qp	playa
TRmt	shale
Ta3	andesite
Tba	basalt
Tc	conglomerate
Ti	alkali-granite (alaskite)
Tr	mudstone
Tri	granitoid
Tt3	rhyolite
Tvp	rhyolite
Xm	gneiss
Ygr	granite
pC	gneiss

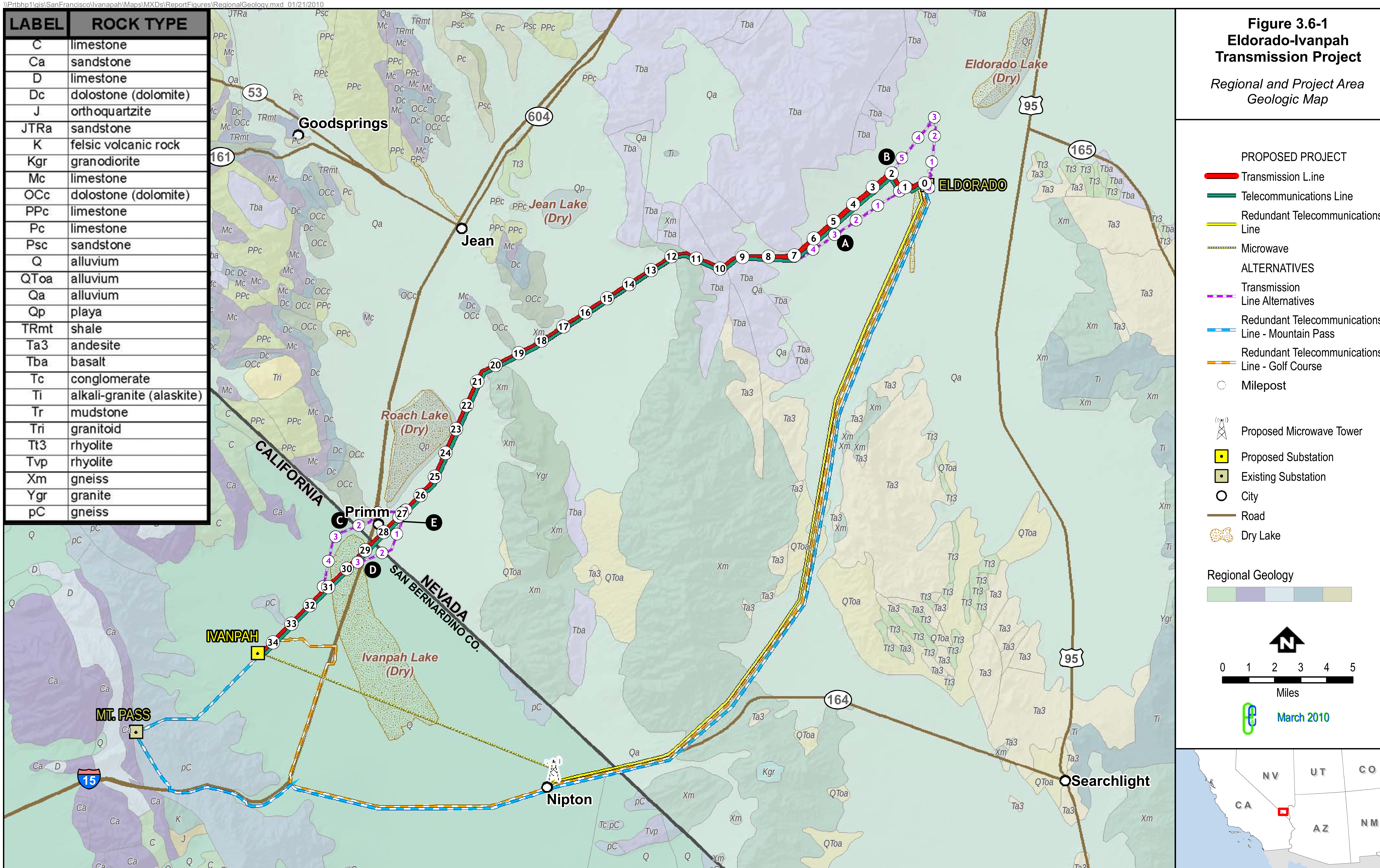

Figure 3.6-1
Eldorado-Ivanpah Transmission Project
Regional and Project Area Geologic Map

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Table 3.6-1 Summary of Surficial and Bedrock Geologic Units

Map Symbol	Age	Formation Description
Nevada		
Qa	Quaternary (Holocene and Pleistocene) [< 1.8 mybp]	Surficial Deposits (undivided): Mixture of alluvial and broken rock deposits.
QToa	Quaternary–Tertiary (Early Pleistocene to late Miocene) [0.8 to 5 mybp]	Old Alluvium (undivided): Old alluvial fan deposits.
Tba (Tv)	Tertiary (Late to middle Miocene) [5 to 13 mybp]	Andesite and Basalt Flows: Numerous volcanic rocks.
OЄc (MzPzs)	Paleozoic to Mesozoic–(Cretaceous to Cambrian) [66 to 570 mybp]	Old Sedimentary Rocks (undivided)
Xm	Precambrian [>570 mybp]	Metamorphic Rocks
California		
Q	Quaternary (Pleistocene to Holocene) [0 to 1.8 mybp]	Quaternary Alluvium
pC (epЄ)	Precambrian [>570 mybp]	Earlier Precambrian Metamorphic Rocks

Source: USGS 2005
Key:
mybp = million years before present

Alluvial deposits have been mapped to various degrees of detail ranging from a generalized approach (CDMG 1961, Stewart and Carlson 1978, Miller et al. 1999) to a careful segregation of younger and older, active to inactive units (NBMG 2006, USGS 2006). Undivided Holocene to Pleistocene Surficial Deposits (Qa/Q) are composed of a mixture of alluvial and talus deposits consisting of poorly consolidated sand, silt, and gravel. Older ~~young~~ alluvial deposits are made up of sand and gravel fragments from granitic sources that weather and are characterized by weakly developed pavements that generally lack varnish (chemical staining). These pavements are composed predominantly of gravels from which the wind has removed most of the fine-grained sand and silt, giving an appearance like a paved surface. Older units are characterized by a covering of varnished desert pavement with a fairly rough surface topography and have been identified principally in Ivanpah Valley between Clark Mountain and the Lucy Gray Mountains, although they are likely much more widespread.

In the valley bottoms and flat areas, latest Holocene to late Pleistocene playa deposits ~~of~~ are characterized as predominant~~e~~ly playas actively receiving water and sediment from the surrounding areas and include Ivanpah, Roach, and Jean dry lakes. These deposits are weakly bedded and poorly sorted (exhibit a range of grain sizes from clay to gravel). The areas are generally flat and prone to flooding and receiving stream flow and standing water, and are subject to wind-blown accumulation and wind erosion.

In summary, approximately 76 percent of the proposed project footprint and alternatives are located on alluvium (mostly alluvial fans), 46 percent on bedrock, and 17 percent on playa deposits. Less than one percent is located on land disturbed by human activities.

Most alluvial deposits in this region, with the exception of lake deposits, are formed within a larger deposition system called alluvial fans. Alluvial fans are significant because they are subjected to random flood events, which can be unpredictable. Early Pleistocene- to late Miocene alluvial fan deposits, indentified as undivided Old Alluvium (QToa), are derived from granitic bedrock sources consisting predominantly of gravel of varying sizes. These deposits are fairly dense to cemented and of mixed composition, and generally lack visual evidence of older surfaces and/or soil horizons. These deposits form deeply cut, steep topography with little or no evidence of previous surface topography being retained. These deposits are largely undivided (not segregated into other distinct identifiable geologic units) in terms of how the deposits were accumulated. The only extensive area within the proposed project area where this unit is directly observable is in the valley between the McCullough and Lucy Gray mountains.

Numerous Tertiary volcanic (andesite and basalt) flows (Tba/Tv) are exposed within the proposed project area and may contain some interbedded sedimentary rocks. Exposures of Paleozoic- to Mesozoic carbonate (limestone and dolomite) and siliclastic (sandstone, mudstone, and conglomerate) rocks are present within the proposed project area and are mapped as dolostone (OЄc). These rocks make up the bulk of Sheep Mountain north of the Lucy Gray Mountains, the Bird Spring Range, and the Spring Mountains. At the southern end of the Spring Mountains is a small outcrop of the Goodsprings Dolomite (DЄ).

The oldest metamorphic rocks (Xm) exposed in the proposed project area include highly metamorphosed, compositionally-layered, Precambrian rocks that overlie older basement rocks (Miller et al. 1999).

California

In California, Quaternary stream and valley alluvium, alluvial fan deposits (both younger and older), and lake and playa deposits are exposed along slopes and low-lying flats and valleys. These deposits generally overlie and/or are marginal to bedrock units that include Tertiary undifferentiated volcanic flows with some interbedded sedimentary rocks and Precambrian metamorphic and granitic rocks.

Alluvial fan deposits have been mapped mostly as generalized units (CDMG 1961, Miller et al. 1999), with some detailed segregation of younger and older, active to inactive units (USGS 2006). Recent Holocene alluvium (Qal) is a poorly sorted mixture of sand and gravel, typically uncemented, unconsolidated, and easily eroded by water or wind. The surface appears as an undulating topography, with little erosional cutting by stream channels. The alluvial fan deposits associated with this unit are characterized by surfaces and stream channels actively receiving sediments within the last few years or decades from ephemeral streams. These deposits may be prone to flooding in some areas. Unnamed lake and playa deposits in the valley bottoms and low-lying flat areas are identified as Quaternary Lake Deposits (Ql/Q). These deposits are similar to the playa deposits (Qp) mapped in Nevada. Older fan gravels that are characteristically elevated above the adjacent topography and eroded are identified as Middle and Early Pleistocene old alluvial fan deposits (Qoa) consisting of poorly sorted silt, sand, and gravel (CDMG 1971).

Earlier Precambrian Metamorphic rocks (pC/epЄ) are exposed within the proposed project area. These contain undifferentiated metamorphic rocks cut by roughly vertical igneous intrusions (dikes). These rocks are exposed in the Clark Mountains at and surrounding the Mountain Pass substation.

The above-described geological units are located within the proposed project area; however, the proposed routes do not intersect all of the above units. In general, longer routes encounter more geologically different units, although some of the more limited sections and alternatives may encounter a wider range of units as well. Table 3.6-2 provides a summary of the proposed routes, alternative routes, and associated geological unit(s).

In general, the important factors that affect construction in these units are foundation bearing capacity, slope/excavation stability (unit strength and slope angle), surface stability for roads/pads, excavatability (how easily the units can be excavated using standard earth-moving equipment), and chemical reactivity (typically corrosion) with concrete and steel. The cohesion (how well the sediments stick together) and composition (affects how easily the sediments can be made denser) of sediments down to tower foundation depths (20 to 40 feet) will impact foundation stability and excavatability. Material strength and cohesion and slope angles will affect slope stability (the tendency to slide); the steeper the slope and/or the weaker the unit, the more likely that the area is susceptible to landslides. Geologic unit cohesiveness and particle size gradation (a variety of particle sizes versus only one particle size) will impact road surface stability and pier excavation stability. Material type, age, and the natural environment within which the sediments were deposited will affect chemical characteristics, particularly corrosion potential.

Table 3.6-2 Geologic and Surficial Units Associated with the Proposed Project and Alternatives

Alternatives													
El Dorado–Ivanpah 220-kV Transmission Line – Telecommunication Line				**State**	**Geologic Units**								
		Alternative Routes			XM	pC (epЄ)	OЄc (MzPzs)	Tba	QToa		Qa	Q	
		(Proposed)		CA/NV	**X**			**X**			**X**	**X**	
		A		NV							**X**		
		B		NV							**X**		
		C		CA/NV			**X**				**X**	**X**	
		D		CA/NV							**X**	**X**	
		E (sub-)		NV							**X**		
Ivanpah Substation				**State**	**Geologic Units**								
					XM	pC (epЄ)	OЄc (MzPzs)	Tba	QToa		Qa	Q	
				CA							**X**		
Redundant Telecommunication Line + Alternatives				**State**	**Geologic Units**								
	Section	**Alternative Routes**	**Description**										
					XM	pC (epЄ)	OЄc (MzPzs)	Tba	QToa		Qa	Q	
	1		Mountain Pass + Golf Course	NV	**X**				**X**		**X**		
	2		Mountain Pass + Golf Course	CA/NV							**X**		
	3	1 + 2	Mountain Pass + Golf Course	CA							**X**		
	3	1	Mountain Pass	CA		**X**					**X**		
	3	2	Golf Course	CA							**X**	**X**	
	3A	MW Route		CA							**X**	**X**	

Source: USGS 2005

Slope stability issues are most important in the sections of the proposed and alternative transmission line routes where topography is steep and bedrock/basement rock is present (the McCullough Mountains and the hill northwest of the Town of Primm), which is a small portion of the overall project. Since most of the proposed project area is within the alluvial fan deposits, and most is underlain by younger and intermediate-age alluvial fan materials, foundation and excavation stability, chemical characteristics, and surface trafficability (ability of a given vehicle to traverse a specified terrain) are important.

Faulting and Seismicity

Several active (fault rupture within the past 11,000 years) and potentially active (fault rupture within the past 1.6 million years) faults related to regional strike-slip (mostly horizontal side-to-side motion) faulting, as well as to extensional tectonics (a pulling apart of the earth's crust) in the Great Basin and eastern Mojave Desert are present within 100 miles of the proposed project area (Table 3.6-3). The fault locations can be found on the Fault Activity Map of California (CDMG 1994).

Table 3.6-3 Summary of Active and Potentially Active Faults within 100-mile Radius of Proposed Project Area

		Estimated Maximum Earthquake Event		
Fault Name, Zone, or System	**Approximate Distance**[a] (miles)	**Maximum Earthquake Magnitude** (Mw)	**Peak Site Surface Acceleration** (g)	**Estimated Site Intensity** (Modified Mercali Scale)
Stateline Fault System	**3**[a] **(28)**[b]	**7.0**[c]	N/A	VII
Black Hills	**34**[a] **(3)**[b]	**6.8**	N/A	VI
Death Valley (south)	50	7.1	0.080	VII
Garlock (East)	50	7.5	0.098	VII
Owl Lake	65	6.5	0.047	VI
Pisgah-Bullion Mountain – Mesquite Lake	75	7.3	0.065	VI
Black Mountains	76	N/A	N/A	na
Death Valley (Graben)	78	7.1	0.069	VI
Panamint Valley	80	7.4	0.065	VI
Calico – Hidalgo	83	7.3	0.060	VI
Landers	91	7.3	0.056	VI
Camp Rock-Emerson South – Copper Mountain	92	7.0	0.047	VI
Gravel Hills – Harper Lake	94	7.1	0.050	VI
Blackwater	93	7.1	0.049	VI
Johnston Valley (Northern)	97	6.7	0.039	V
Tank Canyon	98	6.4	0.040	V
Lenwood-Lockhart-Old Woman Springs	99	7.5	0.059	VI

Source: CEC and BLM 2009 (Active fault data modified from Table 2.)
Notes:
[a]Distance measured from the Ivanpah substation location
[b]Distance measured from the El Dorado substation location
[c]Guest et al. (2007)
Key:
Bold Text = Faults that are near or cross the proposed project
N/A = Not available

Potential earthquake-capable (active) faults close to the proposed project area are shown in Figure 3.6-2. One active fault (Black Hills) is located just north of the proposed project on the eastern flank of the McCullough Mountains ~~trending~~, and trends toward the proposed transmission line route and possibly Transmission Alternative Routes A and B. A second active fault (the Stateline Fault System [SFS]), trending northwest–southeast and parallel to the state line just within California, crosses the proposed transmission line route and Alternative Routes C and D. Earthquake activity on distant (greater than 50 miles), larger-scale active fault zones (e.g., the Garlock, Eastern California Shear Zone, Panamint Valley, Death Valley, and Sevier-Toroweap) and the San Andreas could produce large-magnitude earthquakes that would be felt in the project area.

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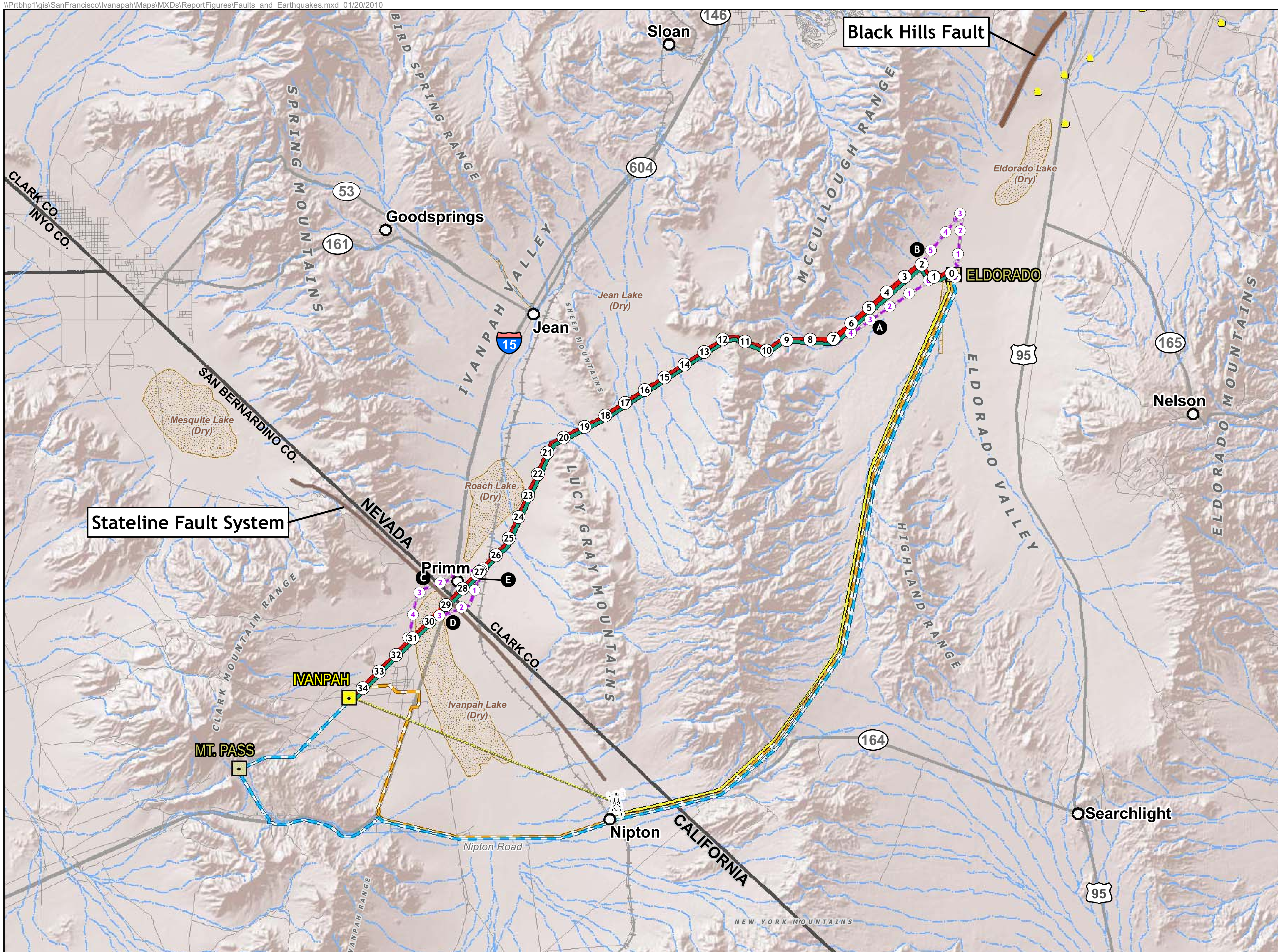

Figure 3.6-2
Eldorado-Ivanpah Transmission Project

Locally Active and Potentially Active Faults

PROPOSED PROJECT
Transmission L.ine
Telecommunications Line
Redundant Telecommunications Line
Microwave
ALTERNATIVES
Transmission Line Alternatives
Redundant Telecommunications Line - Mountain Pass
Redundant Telecommunications Line - Golf Course
Milepost
Proposed Microwave Tower
Proposed Substation
Existing Substation
City
Road
Hydrological Feature
Dry Lake
Historic Earthquake (Magnitude > 3.0)
Quaternatry Fault
Fault

0 1 2 3 4 5
Miles

March 2010

The Black Hills Fault is a complex, northeast-trending, east-dipping (eastward sloping fault beneath the earth's surface) normal fault zone located in the northern McCullough Range along the western edge of Eldorado Valley that forms the northwestern structural boundary of the Eldorado Basin. A geologic basin is a structural depression in the earth's surface, a low area often filled with sediments, which may be folded or warped. The Black Hills Fault may be capable of producing a magnitude 6.4 to 6.8 earthquake.[1]

The SFS is the southern segment of the Pahrump Valley Fault Zone. This fault is an active right lateral (right-handed movement) shear zone and includes several previously recognized faults that are inactive, as well as some discontinuously exposed Quaternary faults (Guest et al. 2007). A shear zone is similar to a fault, but (unlike a fault) exhibits movement over a disperse area as opposed to movement that is offset along a distinct fracture. The SFS lies at the northeastern edge of the Eastern California shear zone, an active north–northwest trending, 124-mile-long right-lateral strike-slip shear zone (Guest et al. 2007, USGS 2006) located at the California-Nevada border. The SFS is defined as a continuous zone of faults and shear zones separated into three segments (the Amargosa Valley, Pahrump, and Mesquite segments), with the Mesquite segment passing through the proposed project Area (CDMG 1961, 1994; San Bernardino County 2007). These data suggest that earthquakes on the SFS may be large but infrequent. Although available evidence suggests that earthquakes greater than magnitude 7 occur on the SFS (Menges et al. 2003), recurrence intervals on the SFS have been estimated to be greater than 10,000 years (Anderson 1998, Menges et al. 2003), suggesting a low probability for a large earthquake associated with the fault system (Guest et al. 2007). Other faults in the proposed project area are pre-Quaternary (not active or potentially active based on existing data) and cross or project toward the proposed transmission line route in the McCullough Mountains (Stewart and Carlson 1978). Two of these faults (unnamed) appear to cross the route. It is likely that these faults are represented by highly fractured basement rock (rock beneath the overlying sediments) that may affect engineering qualities of the material and serve as conduits (pathways) for spring flow.

There are few earthquakes (USGS 2008b) greater than magnitude 3.0 reported within 50 miles of the central portion of the proposed project area (at the north end of the Lucy Gray Mountains). One event of magnitude 6.1 (November 1911) was reported about 40 miles to the southwest of the proposed project area, just north of Baker, California; no specific information was found for this event and its location is considered poorly defined. 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 proposed 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.

Soils

The soils within the proposed project area generally reflect 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, Transmission Alternative Routes C and D, and Transmission Sub-Alternative route E), and along State Route (SR) 164 or the Union Pacific Railroad (UPRR) tracks near Nipton. No agricultural or rural residential land is within the proposed project area.

A summary of the significant characteristics of the major soil associations (National Resources Conservation Service [NRCS] 2008) traversed by the Eldorado–Ivanpah route segments is presented in Table 3.6-4. The soil associations are listed in numerical, rather than geographic, order. There are 19 soil units identified; 14 are in Nevada and five are in

[1] The most common measurements of earthquake magnitude are the moment magnitude (Mw) and Richter (local) magnitude, although sometimes surface wave magnitude or body wave magnitude may be used. Some data sources do not state which is provided, so the original source and further referenced sources should be consulted for more certain indication of which measurement was used.

California. Included in the table are the NRCS soil unit identification number, the soil association name, 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, rather than for site-specific engineering. The majority of the soils in the proposed project area are sand and gravel-rich and excessively drained to well-drained, which reduces erosion potential.

Table 3.6-4 Summary of the Significant Characteristics of Major Soil Associations

NRCS Unit ID	Soil Association	Description	Shrink/Swell Potential[1]	Corrosion[2]	
				Concrete	Uncoated Steel
Nevada					
140 and 143	Haleburu	Colluvium and/or weathered from volcanic rock; well-drained.	L	L	H
150	Hypoint	Mixed alluvium; somewhat excessively drained.	L	L	H
313	Weiser-Oldspan-Wechech	Alluvium parent material derived from limestone and dolomite; well-drained.	L–M	L	H
380	Tonopah-Arizo	Alluvium parent material derived from mixed sources; excessively well-drained.	L–M	L	H
391	Tipnat-Bluepoint-Hypoint	Mixed alluvium parent material; well-drained.	L–M	H	H
400	Arizo-Cafetal	Mixed alluvium parent material; excessively drained.	L–M	L	H
430	Bluepoint-Tipnat-Grapevine	Eolian (wind blown) sands parent material; excessively drained.	L–M	L	H
450	Arizo	Mixed alluvium parent material; excessively drained.	L	H	H
500	Playa	Lacustrine (lake) deposits parent material; very poorly drained.	M–H	H	H
622	Orwash-Arizo-Lanip	Mixed alluvium parent material derived from granite; somewhat excessively drained.	L	L	H
651	Peskah-Arizo	Alluvium parent material derived from volcanic rock; well-drained	L–M	L	H
754	Haleburu-Hiddensun	Colluvium and/or weathered from volcanic rock; well-drained.	L	L	H
780	Prisonear	Eolian (wind blown) sands over alluvium derived from limestone; well-drained.	L	L	H
California					
3520	Arizo	Alluvium derived from metamorphic and sedimentary rock; excessively well-drained.	L–M	L	H
3650	Weiser	Alluvium parent material derived from limestone and dolomite; well-drained.	L–M	H	L
3660	Colosseum	Alluvium parent material derived from limestone and dolomite; somewhat excessively drained.	L–M	L	H

Table 3.6-4 Summary of the Significant Characteristics of Major Soil Associations

NRCS Unit ID	Soil Association	Description	Shrink/Swell Potential[1]	Corrosion[2]	
				Concrete	Uncoated Steel
4180	Peskah-Arizo	Alluvium parent material derived from volcanic rock; well-drained.	L–M	L	H
Playa (see Nevada 500)	Playa	Lacustrine (lake) deposits parent material; very poorly drained.	M–H	H	H

Source: NCRS 2008
Notes:
[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 generally defined as “low = L”, “medium = M”, or “high = H” based on the NCRS Unified Soil Classification of the 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.
Key:
H = High
L = Low
M = Medium

3.6.1.2 Geologic Hazards

Fault Rupture

A factor considered in the seismic (earthquake) 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 (offset) within the proposed project area considers the SFS Mesquite segment and the Black Hills Fault (Figure 3.6-2). There is substantial uncertainty as to the location of these faults. The Mesquite Fault segment crosses the proposed transmission line route and Transmission Alternative Routes C and D along the California-Nevada border at the Town of Primm nearly perpendicular to the proposed transmission line route, at a 20- to 70-degree angle to Alternative Route C and at a 60- to 70-degree angle to Sub-Alternative Route D.

Ground Shaking

The intensity of the seismic shaking (strong ground motion) during an earthquake in the project area would depend on the distance between the area and the epicenter (point at the earth’s surface directly above the initial movement of the fault at depth) of the earthquake, the magnitude (seismic energy released) of the earthquake, and the geologic conditions underlying and surrounding the proposed project area. Earthquakes occurring on faults closest to the project area would most likely generate the largest ground motion.

The USGS provides a uniform estimate of the intensity (strength; not to be confused with magnitude) of earthquake-induced ground motion based on an up-to-date assessment of potential earthquake faults or other sources. A commonly used benchmark is peak horizontal ground acceleration. The probability of occurrence for this peak is given as a fraction of the acceleration of gravity (g; 0.2). The approximate estimated range of peak ground acceleration for a probability of 2 percent (0.02) in 50 years in the proposed project area is presented in Table 3.6-5. Applying the peak ground acceleration shaking map for the 7.3 magnitude Landers earthquake (CISN 2008) to the Mesquite segment of the SFS, the peak ground accelerations would have been similar to those shown in the table. Overall, this estimate of earthquake intensity at the Mesquite segment of the SFS suggests that strong ground shaking would be within the levels experienced in the Landers earthquake area in 1992 and the Hector Mine earthquake in 1999, both in the Mojave Desert region. Electrical transmission lines experienced some damage in each of these earthquakes.

Table 3.6-5 Approximate Estimated Range of Peak Ground Acceleration

Project Facility	Estimate Based on 2% in 50 Years Peak Horizontal Ground Acceleration (g)	Estimate of SFS Earthquake Intensity Based on Magnitude 7.3 Landers 1992 Earthquake (g)
Proposed Transmission Line Route Segments		
Eldorado to McCullough Mountains	0.16 to 0.20	0.20 to 0.25
McCullough Mountains	0.15 to 0.16	0.20 to 0.25
McCullough Mountains to Ivanpah	0.12 to 0.15	0.18 to 0.50
Transmission Alternative/Subalternative Routes		
A	0.16 to 0.17	0.18 to 0.20
B	0.17 to 0.20	0.15 to 0.18
C	0.13	0.40 to 0.50
D	0.13	0.40 to 0.50
E	0.13	0.40 to 0.50
Ivanpah Substation		
Ivanpah Substation	0.12	0.35
Telecommunications Alternatives and Microwave Tower		
Conduit Near Ivanpah Substation	0.13	0.35
Conduit East of Nipton	0.12 to 0.13	0.30 to 0.45
Conduit West of Nipton	0.12 to 0.14	0.30 to 0.45
Microwave Tower	0.12 to 0.13	0.30 to 0.45

Source: USGS 2008a, CISN 2008
Key:
g = Acceleration of gravity

Liquefaction

Liquefaction occurs primarily in saturated, loose, fine- to medium-grained soils in areas where the groundwater table is within approximately 50 feet of the ground surface. Shaking causes the soils to lose strength (that is, lose their ability to stick together) and behave as a liquid. Liquefaction, which can include lateral spreading, subsidence, buoyancy effects, and loss of bearing strength (the ability to support a load such as a building foundation), is caused when these sediments temporarily lose their shear strength during strong ground shaking. Susceptibility to liquefaction is a function of the sediment density, water content, depth, and peak ground acceleration. Over most of the proposed project area liquefaction would be very unlikely due to groundwater depth (generally much greater than 50 feet). Geologic material in the project area have the potential to include substantial clay- and silt-rich units (playas and playa fringe areas) and areas with a high percentage of coarse sedimentary particles such as gravel, cobbles, and boulders (intermediate and older alluvial fans), and some units with calcium carbonate cementation (some intermediate and older alluvial fans). Neither the San Bernardino County General Plan Safety Element nor the Clark County Comprehensive Plan indicates liquefaction potential within the proposed project area. The most likely exceptions would be around the perimeter of playas (playa fringes) where sand layers could be saturated with perched water; that is, shallow groundwater of limited extent that is situated on top of a layer of clay. Such conditions where liquefaction could be produced by rupture of a fault would be determined by geotechnical investigations as recommended in APM GEO-1.

Landslides

Landslides, rockfalls, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, with potentially disastrous results. Rockfalls and debris flows are examples of earth movements that occur rapidly, often without warning. Landslides do occur rapidly without warning but can also provide signs of movement before the slide moves completely. Most of the proposed project area is in low to moderately sloping topography 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 Transmission 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 (landslide) movement of moderate to large sections of hillslope within or adjacent to the route. Such movements can have damaging effects. No landslides have been designated on maps reviewed for this study; however, rockfall hazards could include blocks from a few feet to over 10 feet in diameter.

Subsidence

Subsidence is the settling of the ground surface due to compaction (consolidation) of underlying unconsolidated (loosely packed) sediments. Subsidence is most common in uncompacted soil, thick unconsolidated alluvial material, and improperly constructed artificial fill. Subsidence due to groundwater withdrawal is possible due to substantial pumping; however, there are no known records of such conditions in the proposed project area. Continued and/or increased groundwater withdrawal or dewatering from the Ivanpah and Eldorado valleys may cause an overdraft condition (where groundwater removal exceeds recharge). If that occurs, signs of subsidence could be observed. Many years or decades may be needed for the effects of excessive removal of groundwater to be manifested. Local subsidence in the form of sinkholes has been observed along the northern edge of Ivanpah Dry Lake. While groundwater withdrawal or other factors may cause subsidence, in this case the cause is believed to be from dehydration of clays between the soil surface and the water table due to fluctuations in hydrology. This dehydration can result in a major loss of volume, and thus the collapse of overlying soils (CEC and BLM 2009).

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 from ground cracking for transmission line towers with deep foundations. Within the proposed project area, ground cracking potential exists along the McCullough Mountains segment and the bedrock portion of Alternative Route C.

Expansive Soil

Expansive soils shrink or swell with changes in moisture content. This characteristic is typically associated with high clay content soils. Changes in soil moisture could result from a number of factors, including rainfall, landscape irrigation, utility leakage, and/or perched groundwater. Expansive soils are typically very fine-grained with high to very high percentages of clay. In Nevada, the soils encountered in the areas of the proposed project and alternative routes exhibit expansion potential that is generally low or low to moderate, with one unit (playa) having a moderate to high potential. In California overall, the potential for expansive soils is generally low to moderate, with one high unit (playa).

Collapsible Soils

Collapsible soils are those that decrease in volume and settle when soil structure changes due to wetting of partially saturated subsoil. Typically, collapsible soils occur predominantly at the base of mountains, where Holocene alluvial fan and wash sediments have been deposited during rapid runoff events. Moreover, seismically-induced ground settlement can occur during strong ground shaking in alluvium if deposits have a low relative density and are dynamically compacted and their volume is thereby reduced. Differential settlement can damage structures placed across such susceptible areas.

3.6.1.3 Mineral Resources

Mineral resources consist of oil and gas and deposits of rock, sand, and gravel. Publically available literature, maps, and online sources were used to evaluate potential impact to mineral resources in the proposed project area. Non-metallic and metallic mineral deposits occur within the general proposed project area and to the west in the Clark Mountains (CDMG 1953). However, no mining of metallic deposits was identified within 1,000 feet of the project components considered herein. Non-metallic deposits within the project area include pumice, feldspar, limestone, and sand and gravel, with sand and gravel potential being the highest along the transmission and telecommunication routes.

North and south of SR 164, between 6 and 17 miles east of Nipton, in the general proximity of the proposed redundant telecommunications Line (Path 2), there are operations for perlite, gold, silver, lead, molybdenum, copper, fluorite, and feldspar (USGS 2009). The proposed aboveground portion of the Mountain Pass Telecommunications Line (attached to the existing Nipton 33-kV poles) intersects the Molycorp Mine, a large rare-earth mine near Mountain Pass, California, hereafter called the Mountain Pass Mine. This may be the only active mine near the California portion of the project. Proximal to the proposed transmission line route in Jean Valley and the McCullough Mountains are sand and gravel and pumice surface mines. As shown in Figure 3.6-3, there are areas (green squares) within BLM land all along the proposed and alternative routes for which there have been mining claim activity. Based on 1996 claims data, approximately two-thirds of the claims are "closed" (Hyndman and Campbell 1999). Davis (2002) indicated that the "Money Pit" in Jean Valley more than 1 mile north of the proposed transmission line route may be the only active mine near the Nevada portion of the project area. However, the Jean Quarry and Sierra Ready Mix Quarry, which are both listed as active operations, are also located less than 1 mile north of the proposed transmission line route (NBMG 2006). While several other operations and mines are in the general area of the proposed routes, they do not appear to be close enough to experience any impact from the project.

The USGS Mineral Resource Data System (MRDS) indicates that there are a few past and current mining locations in the vicinity of the proposed project, but none are located within 1,000 feet of either side of the proposed transmission line route or alternative routes. Based on the available data, the proposed project is not expected to impact any mining activities. This is explained further below.

Eldorado to McCullough Mountains (Proposed Route)

There are no active mines identified in the USGS MRDS database within 1,000 feet of this segment, and there is no known ongoing mineral resource recovery near this segment. In addition, there is almost no mining claim activity along the segment.

McCullough Mountains (Proposed Route)

While there are mining claims in the general area along the segment, there is no known ongoing mineral resource recovery near or close to this segment that would potentially be impacted, and there are no active mines identified in the USGS MRDS database within 1,000 feet of this segment.

McCullough Mountains to Ivanpah Substation (Proposed Route)

There is substantial mining claim activity several miles to the northwest of this segment in the Spring Mountains. Other activity along this proposed route is recorded, but is typically set back 1 or more miles from the segment. There is no known ongoing mineral resource recovery close to this segment that would potentially be impacted; no active mines are identified in the USGS MRDS database within 1,000 feet of this segment.

Alternative Route A (South and West of Eldorado Substation)

There is no mining claim activity along this segment and no known ongoing mineral resource recovery near this segment, and no active mines are identified in the USGS MRDS database within 1,000 feet of this segment.

Alternative B (North and West of Eldorado Substation)

There is ~~no~~ some mining claim activity along this segment, no known mineral resource recovery ongoing near this segment, and no active mines are identified in the USGS MRDS database within 1,000 feet of this segment.

Alternative Route C (West and Southwest of Primm, Nevada)

While there is substantial mining claim activity along this segment, there are no active mines identified in the USGS MRDS database within 1,000 feet of this segment, and there is no known ongoing mineral resource recovery near this segment.

Alternative Route D and Subalternative E (South and East of Primm, Nevada)

There is substantial mining claim activity along this segment; however, there are no active mines identified in the USGS MRDS database within 1,000 feet of this segment and there is no known ongoing mineral resource recovery near this segment.

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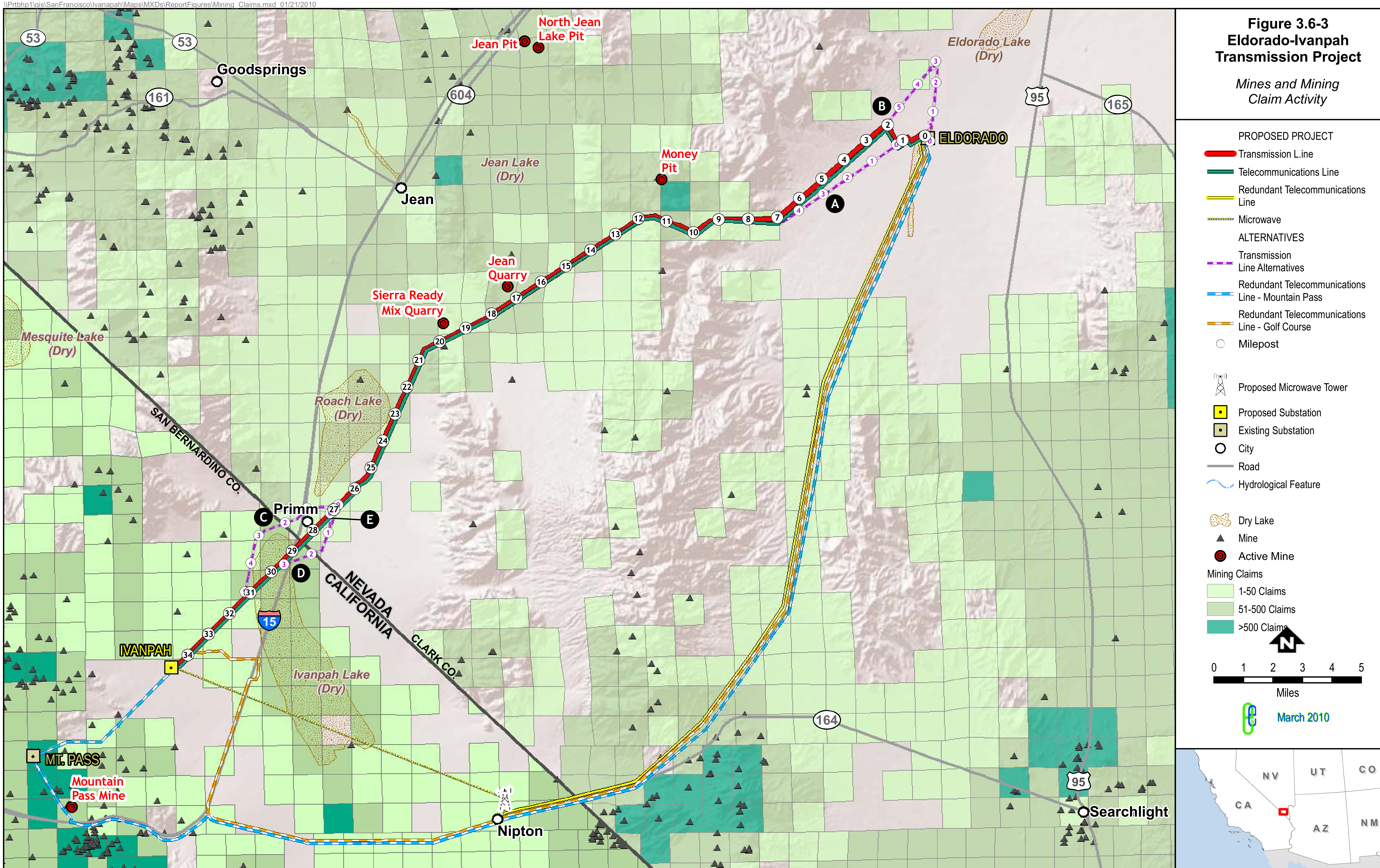

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Ivanpah Substation

The USGS MRDS database indicates no mining claim activity at the substation site, no known ongoing mineral resource recovery near the site, and no active mines identified within 1,000 feet of the site.

Redundant Telecommunication System and the Microwave Tower

~~o ntain ass lte nati e an~~ olf o se lte nati e

There is mining claim activity in the vicinity of this route, which consists of aboveground and underground fiber-optic cable. However, there is ~~these short conduit routes, but~~ no known ongoing mineral resource recovery ~~is~~ near ~~these~~ this segment~~s~~, and no active mines are identified in the USGS MRDS database within 1,000 feet of this~~ese~~ segment.

o ntain ass lte nati e

There is mining claim activity in the vicinity of this route, which consists of aboveground and underground fiber-optic cable. There is ongoing mineral resource recovery in the Mountain Pass portion of this segment, with aboveground fiber-optic cable on existing poles, and active mining is occurring within 1,000 feet of this segment.

Microwave Tower Northeast of Nipton

There is some mining claim activity in the area of this site, including one operation about one-half mile east of this location and one active mining operation about one-half mile to the northeast, but there are no active mines identified in the USGS MRDS database within 1,000 feet of this site.

3.6.1.4 Paleontology

Since the ~~original administrative draft~~Draft EIR/EIS was ~~submitted in January~~ published on April 30, 2010~~ and responses to the document were answered~~, new information on the paleontological resources of the proposed project has become available. In August 2010, a paleontological resources management plan was submitted ~~to~~by SCE ~~by~~from Cogstone Resource Management, Inc., which included~~s~~ a preconstruction paleontological resources walkover and windshield survey and assessment, and a paleontological resources management plan (Scott and Gust 2010). Figure 3.6-4 shows areas in the proposed project that would require full-time monitoring for paleontological resources during construction.

Regional Setting

The proposed project crosses over a number of geologic rock units (Table 3.6-2). The following section describes each geologic unit's extent, rock type, and age, with an emphasis on paleontology and paleontological sensitivity (likelihood of containing scientifically significant fossils). To provide more detailed paleontological data, the geologic unit classifications below are drawn from a different data set than that used to compile Figure 3.6-1. Therefore, not every unit described below is displayed in Figure 3.6-1.

The BLM's Potential Fossil Yield Classification (PFYC) system is used to classify the paleontological potential of geologic units to yield significant fossils during the construction phase (BLM 2007). The BLM established the PFYC system to quantify the occurrence of paleontological resources on public lands~~ and~~, rate their paleontological sensitivity and the risk of impacting them, and suggest appropriate mitigation measures. Geologic units are assigned a classification between 1 (lowest) and 5 (highest). The PFYC system is used by BLM to assess impacts to paleontological resources and suggest appropriate mitigation measures. For a more detailed description of this classification system see Scott and Gust (2010).

Table 3.6-6 shows that units in the project area have either a high or a low sensitivity for paleontological resources that may be present on the surface or could be exposed during ground-disturbing construction activities, based on the Society of Vertebrate Paleontology (SVP) guidelines (1995). The BLM PFYC is also included in the table.

Table 3.6-6 Paleontological Sensitivity of the Lithologic Units Underlying Portions of the Proposed Project Area in San Bernardino County, California, ~~,~~and Clark County, Nevada

~~Lithologic Unit~~	~~Paleontological Sensitivity[a]~~	~~PFYC[b]~~
~~Quaternary alluvium~~	~~High~~	~~4~~
~~Quaternary lake/playa deposits~~	~~High~~	~~4~~
~~Quaternary nonmarine (Quaternary older alluvium)~~	~~High~~	~~3~~
~~Late Tertiary–Quaternary older alluvium~~	~~High~~	~~3~~
~~Tertiary volcanics~~	~~Low[c]~~	~~2~~
~~Paleozoic–Mesozoic sedimentary rocks~~	~~Low[d]~~	~~3~~
~~Precambrian intrusive and metamorphic rocks~~	~~Low~~	~~1~~

~~Notes:~~
[a]~~SVP 1995~~
[b]~~BLM 2007~~
[c]~~High, if sedimentary rocks are present~~
[d]~~High, if solution caves and/or vertebrates are present~~
~~Key:~~
~~PFYC = Potential Fossil Yield Classification (scale of 1–5, with 1 the lowest)~~

Lithologic Unit	Paleontological Sensitivity [a]	BLM PFYC[b]		
		This Report	Scott & Gust 2010	Potential
Quaternary Alluvium	High	4	2,[d] 3b[e]	Low, Unknown
Quaternary Lake/Playa deposits	High	4	3b	Unknown
Quaternary nonmarine (Quaternary older alluvium)	Low	3	2, 3b[e]	Low, Unknown
Late Tertiary-Quaternary older alluvium	Low	3	2	Low
Tertiary Volcanics	Low	2	1	Very Low
Paleozoic sedimentary rocks – Goodsprings Dolomite	Low[c]	3	2	Low
Precambrian intrusive and metamorphic rocks	None	1	1	Very Low

Notes:
[a]Society of Vertebrate Paleontology Guidelines, 1995
[b]Bureau of Land Management Potential Fossil Yield Classification (PFYC; BLM 2007) with 5 indicating the highest potential and 1 the lowest.
[c]High, if solution caves and/or vertebrates are present
[d]Revised PFYC rating by Scott and Gust 2010
[e]Higher PFYC rating in 1-mile radius around playa dry lakes

Quaternary alluvium (Qa, Qal)

Quaternary alluvium (late Pleistocene and Holocene) has been mapped at the surface along the length of the project corridor in California and Nevada (Jennings 1961, Longwell et al. 1965, NBMG 2006). Throughout southern California these units have been repeatedly demonstrated to be highly fossiliferous, yielding the remains of large extinct Ice-Age (Pleistocene) mammals such as mammoths, mastodons, camels, sabertoothed cats, tapirs, sloths, and horses as well as amphibians (salamanders, frogs, toads), reptiles, birds, and small mammals (Jefferson 1991a, 1991b; Reynolds et al. 1991e; Woodburne 1991; Springer and Scott 1994; Scott 1997; Springer et al. 1998, 1999, 2007; Anderson et al. 2002) and the Mojave Desert (Jefferson 1989, 1991a, 1991b; Reynolds 1989; Scott 1997; Scott and Cox 2002, 2008). Near the northern end of Ivanpah Dry Lake, for example, large mammal bone fragments were recovered from sediments mapped as Quaternary alluvium identical to that along portions of the proposed route (Longwell et al. 1965). Similarly, surface exposures of Quaternary alluvium near Glendale, Nevada, yielded mammal fossils including a tooth of extinct horse (*s* sp.). These sediments would have a high potential to contain significant paleontological resources.

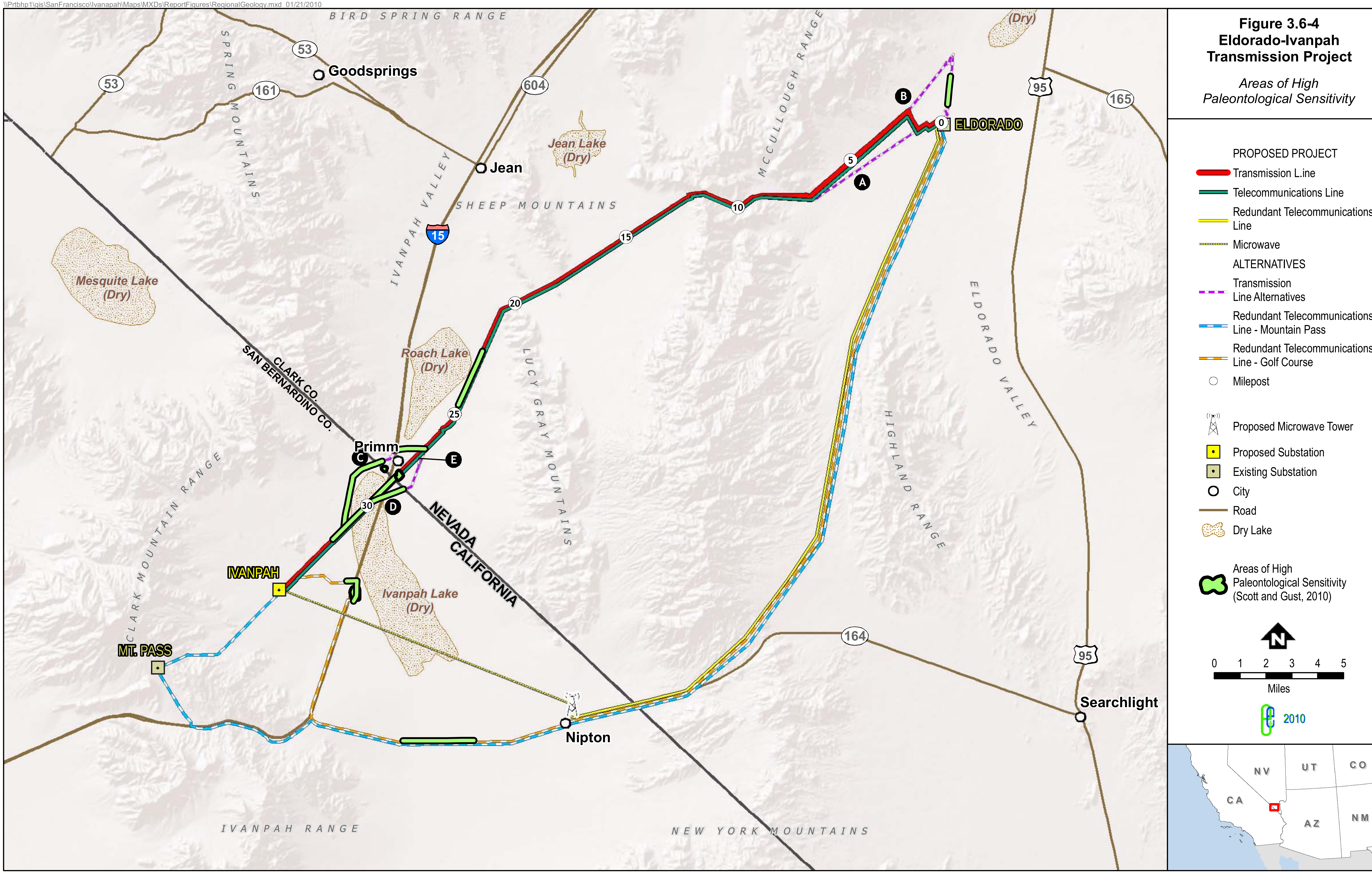
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Figure 3.6-4
Eldorado-Ivanpah Transmission Project
Areas of High Paleontological Sensitivity
PROPOSED PROJECT
Transmission L.ine
Telecommunications Line
Redundant Telecommunications Line
Microwave
ALTERNATIVES
Transmission Line Alternatives
Redundant Telecommunications Line - Mountain Pass
Redundant Telecommunications Line - Golf Course
Milepost
Proposed Microwave Tower
Proposed Substation
Existing Substation
City
Road
Dry Lake
Areas of High Paleontological Sensitivity (Scott and Gust, 2010)
0 1 2 3 4 5
Miles
2010
NV
UT
CO
CA
AZ
NM
BIRD SPRING RANGE
SPRING MOUNTAINS
Goodsprings
Jean
Jean Lake (Dry)
Mesquite Lake (Dry)
Roach Lake (Dry)
Ivanpah Lake (Dry)
IVANPAH VALLEY
SHEEP MOUNTAINS
MCCULLOUGH RANGE
LUCY GRAY MOUNTAINS
HIGHLAND RANGE
ELDORADO VALLEY
ELDORADO
IVANPAH
MT. PASS
Primm
Nipton
Searchlight
CLARK CO.
SAN BERNARDINO CO.
NEVADA
CALIFORNIA
CLARK MOUNTAIN RANGE
IVANPAH RANGE
NEW YORK MOUNTAINS
(Dry)
53
161
604
15
95
165
164
A
B
C
D
E
0
5
10
15
20
25
30

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~~Under~~Originally, the Quaternary alluvium was rated Class 4 (high potential for paleontological resources) under the BLM PFYC system~~, the units would be rated Class 4.~~ (BLM 2007), but subsequent studies by Scott and Gust (2010) rated these sediments as Class 2 (low potential for paleontological resources); that is, this unit is not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils (BLM 2007) over most of the project area. Scott and Gust's field survey indicated that the Quaternary alluvium over most of the project area consists of broad coalescing alluvial fans with the surrounding mountains as a source area for the fan sediments. Scott and Gust state that the Quaternary alluvium is considered to be only potentially sensitive for paleontological resources at the distal end of the alluvial fans within 1 mile of the playas (Ivanpah, Roach, and Eldorado dry lakes) and under the BLM PFYC system rated these sediments as Class 3b (unknown potential for paleontological resources) and recommended full-time monitoring during construction. In his 1920 paper on the groundwater resources of the Ivanpah Valley, Waring presented sections on several wells that were drilled in the Quaternary alluvium adjacent to the Ivanpah playa. One well (No. 103) was located 2 miles south of the present lake bed near Murpheys Well. For exact locations of unknown potential sensitivity monitoring areas see Figure 3.6-4. The section from this well has several thick horizons of silt and clay, which are conductive to the preservation of fossils and maybe older Ivanpah Lake sediments. Away from the playas, the Quaternary Alluvium transitions into the middle and proximal alluvial fan deposits with an increasing percentage of cobble and boulder clasts. Unlike finer-grained sediments (sand, silt, clay), these coarse sediments are not conductive to the preservation of fossils. During the course of the preconstruction field survey for paleontological resources, near Ivanpah Lake playa, a Holocene or late Pleistocene plant site (2010KMS0809.1) was identified in a small channel in Quaternary alluvial deposits about 1 meter below the modern surface (Scott and Gust 2010).

Quaternary lake/playa deposits (Ql/Qp)

These flat-lying deposits in Ivanpah and Roach Dry Lakes consist of light gray to light brown silt, clay, and minor sand. Although modern at the surface, these lake/ playa sediments increase in age with depth, perhaps to the late Pleistocene. These fine-grained sediments often preserve late Pleistocene and Holocene invertebrates (freshwater clams and snails; Taylor 1967, Reynolds et al. 1991d, Jefferson et al. 2004), smaller vertebrates (fish, amphibians, reptiles, birds, and small to medium-sized mammals), and larger extinct vertebrate fossils such as mammoths, mastodons, horses, sloths, and camels (Jefferson 1991b, Reynolds et al. 1991d, Jefferson et al. 2004). Mifflin and Carlson (1979) in their study of pluvial (late Pleistocene) lakes of Nevada could not find shoreline features or an overflow channel and interpreted the age of Ivanpah-Roach Dry Lake basin as recent. However, the Ivanpah-Roach Dry Lake may have been combined into one larger lake than the present lakebed and possibly present during the late Pleistocene, based on clasts of tufa (fragments of carbonate-based minerals deposited in a lake environment) from an Ivanpah Lake Dry high stand or shoreline. These sediments would have a high potential to contain significant paleontological resources. Originally these sediments were rated Class 4 (high potential for paleontological resources [BLM 2007]), but the subsequent preconstruction field survey and assessment by Cogstone Resource Management (Scott and Gust 2010) rated the lake/playa sediments as Class 3b (unknown potential for paleontological resources) and recommended full-time paleontological monitoring during construction. No paleontological resources were identified during the preconstruction survey (Scott and Gust 2010).These ~~units~~rocks would be rated Class 4 (BLM 2007).

Quaternary non-marine deposits (Qoa/Qc)

Quaternary non-marine deposits (mapped as Quaternary older alluvium) have been mapped at the surface along the project corridor in the vicinity of the Clark Mountains in California (Jennings 1961). These deposits consist of poorly sorted debris that range from pebble to boulder in a matrix of brown silt derived from Clark Mountain. Elsewhere, older Pleistocene sediments throughout southern California (Jefferson 1991a, b; Reynolds and Reynolds 1991e; Woodburne 1991; Springer and Scott 1994; Scott 1997; Springer et al. 1998, 1999, 2007; Anderson et al. 2002) and the Mojave Desert (Jefferson 1989, 1991a, 1991b; Reynolds 1989; Scott 1997; Scott and Cox 2002, 2008) have been repeatedly demonstrated to be highly fossiliferous. Where present at the surface or at depth, these sediments have the potential to contain significant paleontological resources. Originally the Quaternary nonmarine deposits or older alluvium were assigned Class 3 (moderate potential for paleontological resources [BLM 2007]); however, because of the coarseness of these sediments, Scott and Gust (2010) rated them as Class 2 (low potential for paleontological resources [BLM 2007]) and recommended spot-check or part-time paleontological monitoring over most of the outcrop area. No paleontological resources were identified during the preconstruction field survey (Scott and Gust 2010).The ~~units~~rocks would be rated Class 3 (BLM 2007).

Quaternary Tertiary Older Alluvium (Qtoa)

These alluvial fan deposits are derived from granitic rocks sources in the vicinity of the McCullogh and Lucy Gray mountains and are Late Miocene to early Pleistocene in age. Although these sediments are~~ predominately~~ predominantly coarse grained, that is, sand and gravel, old buried soils (paleosols) are present in several horizons (NBMG 2006). These soil horizons, which could yield significant fossils of vertebrates ~~fossils~~ such as small mammals, were present at the surface or at depth along the proposed project.~~ These sediments would have high potential to contain significant paleontological resources.~~ Originally, the Quaternary Tertiary Older Alluvium (Plio-Pleistocene gravels in Scott and Gust [2010]) were assigned to Class 3 (moderate potential for paleontological resources; BLM 2007).The units would be rated Class 3, but subsequently they were assigned to Class 2 (low potential for paleontological resources) and recommended for spot-check paleontological monitoring during construction, based on observations during the preconstruction field survey, during which no paleontological resources were identified (Scott and Gust 2010).

Tertiary volcanic rocks (Tba/Tv)

Surface exposures of these rocks have been mapped along the project corridor in the McCullough Range in Nevada (Longwell et al. 1965). Tertiary volcanic rocks in the Mojave Desert have low potential to contain significant fossil resources. However, it is possible to have inclusions of sedimentary rocks within volcanic rocks. These sedimentary inclusions have the potential to contain significant fossil resources; therefore, these volcanic rocks would be assigned a high paleontological sensitivity. To the south near Needles, ash-rich lacustrine sediments within volcanic rocks yielded middle Miocene (15 mybp) flora and fauna consisting of the fossil remains of a sequoia, wood, conifer needles, ostracods, flamingo footprints, a pika, a coyote-sized dog, a bobcat-sized cat, a rodent, an antelope-sized cervoid, two camels, and a ~~rhino~~rhinoceros. ~~The Tertiary volcanic rocks would be were rated Class 2.~~

~~**Paleozoic** and **Mesozoic sedimentary rocks (OЄc/MzPzs)**~~

The Tertiary volcanic rocks were rated Class 2 (low potential for paleontological resources; BLM 2007). Subsequent work by Scott and Gust (2010) agreed with this designation and recommended spot-check paleontological monitoring during construction. No paleontological resources were identified during the preconstruction field survey (Scott and Gust 2010).

Cambrian to Devonian Goodsprings Dolomite (DЄg)

Undivided Paleozoic and Mesozoic rocks have been mapped at the surface along the proposed project corridor in the Clark Mountain vicinity, California (Jennings 1961, NBMG 2006). Because of mapping difficulties, Paleozoic-Mesozoic carbonate rocks such as limestone and dolomites, and terrigenous rocks such as ~~sandstones, mudstones, and conglomerates~~silty shale~~,~~ have been placed in this broad rock unit. This unit, which includes the Bonanza King Formation, the Nopah Formation, the Pogonip Group, and the Ely Springs Dolomite (Gans 1970, 1974) ranges from 443 to 513 million years in age. In this area, some of these rocks were deposited in ancient shallow seas and generally yield a wide variety of marine fossil invertebrates such as sponges, brachiopods (primitive clams), gastropods (snails), pelecypods (advanced clams), trilobites, graptolites (marine kelp-like animals), and echinoderm crinoids (related to starfish, sand dollars, and sea urchins; Dames and Moore 1992). Invertebrate ~~F~~fossils ~~of this nature~~ are abundant and widespread throughout the southern Nevada and eastern California region, to such a degree that ~~these fossils~~they are not generally considered to have high paleontological significance.~~ Near Stateline, California, paleontology monitors on the Intermountain Power Project found many marine invertebrates in rocks of the Mississippian Monte Cristo Formation (Hewitt 1931, Reynolds 1986, Moore 1991). Also, during construction on the Kern River Pipeline project, marine invertebrates (clams, snails, corals) were collected from rocks of the Bird Spring Formation (Pennsylvanian) and Kaibab Limestone (Dames and Moore 1992). Time-diagnostic invertebrates from these limestone rocks have somewhat higher significance, but are still relatively common in the region. Elsewhere, middle- to late-Paleozoic limestone in this area has the potential to yield teeth and bones of early bony fishes and sharks. For example, just north of the City of Las Vegas, fossil shark teeth were collected from the surfaces of Mississippian limestone of the Battleship Wash Formation in the~~

~~Arrow Canyon Range (Langenheim et al. 1962). Also, during construction of the Kern River Pipeline project, the first fossil bony fish remains (teeth) were recovered from the Mississippian Monte Cristo Formation and Kaibab Limestone in Nevada (Dames and Moore 1992). Any~~ However, any vertebrate remains (shark, fish) recovered from Paleozoic ~~or Mesozoic~~ sedimentary rocks would be highly significant. There is a potential for vertebrate fossils and trackways in the Mesozoic sedimentary rocks. Recently, fossil dinosaur and pterosaur (flying reptiles) tracks have been reported from the early middle Jurassic Aztec Sandstone of the nearby Mescal Range in eastern San Bernardino County (Reynolds 2005, Reynolds 2006~~a, 2006b~~, Reynolds and Michelson 2006).

The undivided Paleozoic ~~and Mesozoic rocks~~rocks of the Goodsprings Dolomite have a low potential to contain significant paleontological resources, but in limestone and marble, there is a potential for solution caves that contain significant fossils. In the past, these caves were often open at the surface, and accumulated bones of various kinds of animals from raptors and other predators dropping remains into the opening, or from the remains of animals that inhabited the cave. Other animals such as pack rats built nests and also collected bones from around the cave entrance. Many of these caves are older than 10,000 years and elsewhere in the Mojave Desert have yielded the remains of large, extinct, late Pleistocene mammals such as camel, horse, and sloth (Mead and Murray 1991, Reynolds et al. 1991a, Whistler 1991, Gromney 2003, Jefferson et al. 2004, Museum of Paleontology, University of California, Berkeley 2009) as well as smaller mammals, amphibians, reptiles, and birds (Goodwin and Reynolds 1989; Force 1991; Reynolds et al. 1991a, 1991b, 1991c; Jefferson et al. 2004). If cave deposits were encountered during construction at depth anywhere along the proposed project, they would be considered scientifically significant. Originally the Paleozoic sedimentary rocks of the Goodsprings Dolomite were rated Class 3 (moderate potential for paleontological resources; BLM 2007), but subsequent information provided by Scott and Gust (2010) classified these rocks as Class 2 (low potential for paleontological resources) and recommended spot-check paleontological monitoring during construction. During the preconstruction paleontological resources field survey, a single outcrop identified as Goodsprings Dolomite near Primm, Nevada, was inspected. Although no paleontological resources were observed (Scott and Gust 2010), paleontological monitoring during construction consisting of spot checks for caves and woodrat middens was recommended. The Paleozoic-Mesozoic sedimentary rocks would be rated Class 3 (BLM 2007).

Earlier Precambrian intrusive and metamorphic rocks, undivided (pC/ePЄ) in California and Ancient intrusive and metamorphic rocks (Xm) (undivided Proterozoic) in Nevada

Two similar metamorphic (rocks that have been altered by heat and pressure) basement rocks occur in the southern McCullough Range in Nevada and in the Clark Mountain in California. Earlier Precambrian metamorphic rocks in the Clark Mountains (Jennings 1961, Longwell et al. 1965) and the ancient intrusive and metamorphic rock (NBMG 2006) undivided (Proterozoic) in the McCullough Range in the proposed project area consist of granite, granite gneiss, schist, granitic augen gneiss, quart monzonite, marble, and schist. Due to the heat and pressure associated with the formation of igneous and metamorphic rocks, these rocks have low potential to contain significant paleontological resources (SVP 1995). Originally, these Precambrian rocks were rated Class 1 (very low potential for paleontological resources; BLM 2007) and subsequent work by Scott and Gust (2010) agreed with this designation. No fossils were observed during the preconstruction paleontological resources field survey, and spot checks were recommended for caves/ woodrat middens during the construction phase of the project (Scott and Gust 2010).The rocks would be rated Class ~~1~~I (BLM 2007).

Records Search

The Regional Paleontological Locality Inventory at the San Bernardino County Museum (SBCM) shows that several paleontological resource localities are recorded within 1 mile of the proposed project. The applicant-prepared PEA stated that the nearest paleontological resource locality (SBCM 1.2.5) is located on the California-Nevada border approximately 300 feet northwest of the proposed route (Scott 2008). This locality yielded indeterminate large mammal bone fragments from sediments mapped as Quaternary alluvium by Longwell et al. (1965). Additionally, localities SBCM 1.2.1 through 1.2.4 near the proposed route in Sections 35 and 36 of T 17N, R 14E have produced fossil remains of tortoise (*ophe s* sp.), kangaroo rat (*ipo o ys* sp.), wood rat (*eoto a* sp.), and other small vertebrates, as well as a partial hackberry seed (*eltis* sp.) and clasts of tufa from the high stand of Ivanpah Dry Lake. Fossil hackberry seeds are abundant in nearby cave deposits which contain Pleistocene vertebrate faunas (Reynolds et al. 1991b). Tufa is common at the top of the sedimentary section at several Pleistocene lakes in San Bernardino County, including Piute Valley and Cadiz. However, none of the localities near Ivanpah Dry Lake has yielded temporally diagnostic fossil remains. For this reason, a Pleistocene age for these faunas can be suggested, but not demonstrated.

The online records search for microfossil, plant, invertebrate (clams and snails), and vertebrate (animals with backbones) localities conducted at the Museum of Paleontology, University of California, Berkeley (Museum of Paleontology, University of California, Berkeley 2009) indicated no previously recorded paleontological resources within a mile of the proposed project area.

A search of the data base of Late Pleistocene vertebrate localities for California (Jefferson 1991a, 1991b) and for Nevada (Jefferson et al. 2004), which included institutional records and published references, indicated no known paleontological resource localities are recorded within a mile of the proposed project.

3.6.2 Applicable Laws, Regulations, and Standards

Geologic resources and hazards are governed primarily by local jurisdictions. The conservation elements and seismic safety elements of city and county general plans contain policies for protection of geologic features and avoidance of hazards, but do not specifically address transmission line construction projects. Local grading ordinances establish detailed procedures for construction. The following section provides a summary of federal, state, and local laws, regulations, and standards that govern geology, soils, minerals, and paleontology in the project area.

3.6.2.1 Federal

National Environmental Policy Act of 1969, as amended

The National Environmental Policy Act (NEPA; 42 USC 4321 et seq.) was signed into law on January 1, 1970. NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and it provides a process for implementing these goals within the federal agencies. The NEPA process consists of an evaluation of the environmental effects of a federal undertaking. It includes an evaluation of alternatives. There are three levels of analysis depending on whether an undertaking could significantly affect the environment. From least to greatest complexity, these are (1) categorical exclusion determination, (2) preparation of an Environmental Assessment/Finding of No Significant Impact, and (3) preparation of an EIS.

Under NEPA, the terms "effects" and "impacts" are used synonymously. Direct or primary impacts are those caused on site by the project itself, and that occur at the same time and place as the project. Indirect impacts can be reasonably foreseen to be caused by the project but that occur later or further away. Under NEPA, indirect impacts also may be referred to as secondary effects. The potential effects on geological, soil, mineral, and paleontological resources from construction and operation of the proposed project are considered in this analysis. The BLM is responsible for NEPA analysis for this project.

International Building Code

The 2006 International Building Code (IBC) is a model building code developed by the International Code Council (ICC). The IBC sets rules specifying the minimum acceptable level of safety for constructed objects such as buildings. It has been adopted throughout most of the U.S. 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. The IBC replaced the Uniform Building Code (UBC) in 2000.

Federal Land Policy and Management Act of 1976, as amended

The Federal Land Policy and Management Act (FLPMA) established policies and goals to be followed in the administration of public lands by the BLM. The intent of the FLPMA is to protect and administer public lands within the framework of a program of multiple-use and sustained yield, and to maintain environmental quality. Particular emphasis is placed on protection of the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resources, and archeological values. The FLPMA dictates how BLM regulates mineral resources extraction on BLM land.

Bureau of Land Management

The BLM, an agency within the U.S. Department of the Interior, administers 261 million surface acres of public lands, located primarily in 12 western states. The BLM's mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. The public lands provide myriad opportunities for commercial activities. Commercially valuable natural resources include energy and mineral commodities, forest products, grazing forage, and special uses such as rights-of-way (ROWs) for pipelines and transmission lines. The BLM is responsible for managing commercial energy and mineral production from the public lands in an environmentally sound and responsible manner, including leasing related to oil and gas and geothermal minerals. Geothermal resources include all products and byproducts capable of producing geothermal energy. The BLM is also responsible for supervising the exploration, development, and production operations of these resources on both federal and Native American lands. The BLM is responsible for maintaining viable national policies and processes for solid mineral resources under federal jurisdiction.

Classification and Multiple Use Act of 1964

Authorized the Secretary of the Interior to classify and manage BLM land for retention or disposal and for multiple use, including specification of dominant uses and preclusion of inconsistent uses in an area.

Mining and Mineral Policy Act of 1970

This act declared that the federal government policy is to encourage private enterprise in the development of a sound and stable domestic mineral industry and in orderly and economic development of mineral resources, research, and reclamation methods.

California Desert Conservation Area Plan

The California Desert Conservation Area (CDCA) plan defines multiple-use classes for BLM-managed lands in the CDCA, which includes the land area encompassing the proposed project location in California. With respect to geological resources, the CDCA plan aims to maintain the availability of mineral resources on public lands for exploration and development.

Paleontological Resources Preservation Act of 2009

The Paleontological Resources Preservation Act calls on the Secretary of the Interior to protect vertebrate paleontological resources on federal lands by allowing only permitted and qualified researchers to collect vertebrate fossils and scientifically important fossils.

Federal Antiquities Act of 1906

The Antiquities Act was the first law enacted to specifically establish that archaeological sites on public lands are important public resources, and it obligated federal agencies that manage public lands to preserve the scientific, commemorative, and cultural values of such sites (National Park Service [NPS] 2007). This act does not refer to paleontological resources specifically; however, the act does provide for protection of "objects of antiquity" (understood to include paleontological resources) by various federal agencies, including the BLM and the NPS.

3.6.2.2 State

California

California Building Code (2007)

The California Building Code (CBC 2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). The 2007 CBC edition is based on the 2006 IBC (excluding Appendix Chapter 1) as published by the ICC, with the addition of more extensive structural seismic provisions. Chapter 16 of the CBC defines seismic sources and outlines the procedure used to calculate seismic forces on structures. Design of the proposed project should follow the requirements of that CBC chapter because the route lies within a seismic zone (UBC Seismic Zone 3).

Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code Sections 2621–2630

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) is documented in the Public Resources Code (PRC). It regulates development and construction of buildings intended for human occupancy, to avoid hazards from surface fault rupture. This act mitigates against surface fault rupture of known active faults beneath occupied structures. It requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. 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 categorizes faults as active, potentially active, and inactive. The proposed project area (in California) is not located within a designated Alquist-Priolo fault zone.

Seismic Hazards Mapping Act, PRC Sections 2690–2699

The Seismic Hazards Mapping Act of 1990 (PRC 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. These include identified areas that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches (waves in confined bodies of water resulting from seismic activity). City, county, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land use planning and permitting processes. The act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

PRC Chapter 1.7, Sections 5097.5, 5097.9, and 30244

This section of the PRC regulates the removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites. Since the EITP would be located on federal lands, this code would not apply.

Warren-Alquist Act, PRC Sections 25527 and 25550.5(i)

The Warren-Alquist Act requires the California Energy Commission (CEC) to “give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites….” With respect to paleontological resources, the CEC relies on guidelines from the SVP.

California Surface Mining and Reclamation Act

The State Mining and Geology Board implements state policy and regulations for reclamation of mined lands and conservation of mineral resources. The Surface Mining and Reclamation Act of 1975 (PRC Sections 2710–2796) set forth these policies in the California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1, and requires local governments within California to regulate mining operations and to develop planning policies that balance mineral production with maintenance of environmental quality. Since the EITP would be located on federal lands, this act would not apply.

Nevada

Mining

There is no single agency that regulates the use of mineral resources within Nevada. The Nevada Division of Minerals is responsible for permitting oil and gas and geothermal leases. The Division of Environmental Protection, Bureau of Mining Regulation and Reclamation is responsible for issuing permits for mining. The NBMG is a research and public service unit of the University of Nevada and is the state geological survey organization. NBMG scientists conduct research and publish reports on mineral resources, engineering geology, environmental geology, hydrogeology, and geologic mapping. NBMG cooperates with numerous state and federal agencies in conducting research and providing geologic and resource information, including information on mining claims and mineral leases.

Building Code

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.

Nevada Revised Statutes

The Nevada Revised Statutes are the state laws that apply to a project's impacts on cultural resources. Nevada Revised Statutes Sections 381.195– 381.227 and 383.400–383.440 apply the term "prehistoric site" 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 grounds, and sites of religious or cultural importance to a tribe.

3.6.2.3 Regional and Local

California

Most counties and cities in California have regulations that address geologic, seismic, and soils hazards, as well as 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.

San Bernardino County General Plan

The Safety Element of the San Bernardino County General Plan (2007) provides for mitigation of geologic hazards through a combination of engineering, construction, land use, and development standards. The plan addresses the geologic hazards present within the county, including fault rupture, ground shaking, liquefaction, seismically generated subsidence, inundation from seiches or dam breaches, landslides/mudslides, non-seismic subsidence, erosion, and volcanic activity. The county has prepared Hazard Overlay Maps to address fault rupture, liquefaction hazards, and landslide hazards. Special consideration, including possible engineering/geologic evaluation, is required for development of sites designated on the maps.

San Bernardino County 2007 Development Code

The County of San Bernardino (Development Code §82.20.030) requires that paleontologic mitigation programs include site evaluation for paleontological resources in the county including not limited to preliminary field surveys; monitoring during construction; specimens recovery; preparation, identification, and curation of specimens; and report of findings. Also defines qualifications of professional paleontologists.

Nevada

Clark County Building Code

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 Code Chapter 22.04). Transmission line construction projects are not specifically regulated by the county.

3.6.3 Impact Analysis

This section defines the methodology used to evaluate impacts for geologic, soil, mineral, and paleontological resources, including CEQA impact criteria. The definitions are followed by an analysis of each alternative, including a joint CEQA/NEPA analysis of impacts. At the conclusion of the discussion is a NEPA impact summary statement and CEQA impact determinations. For mitigation measures, refer to Section 3.6.4.

3.6.3.1 NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects to geology, soils, mineral, and paleontological resources would result from the project, and explains the significance of those effects in the project area (40 CFR 1502.16). Significance is defined by Council on Environmental Quality regulations and requires consideration of the context and intensity of the change that would be introduced by the project (40 CFR 1508.27). Impacts are to be discussed in proportion to their significance (40 CFR 1502.2[b]). To facilitate comparison of alternatives, the significance of environmental changes is described in terms of the temporal scale, spatial extent, and intensity.

Geologic resources that were evaluated included the geologic setting, geologic hazards, and unique geologic features within the proposed project area. Geologic effects are assessed in two distinct ways: 1) project development's potential to affect a sensitive soil or geologic unit; or 2) project development's potential to increase the risk associated with geologic hazards by installing project components impose additional risk or damage to people or the environment. The impact analysis considered the likelihood of physical alteration, damage, or destruction of geologic features that would result from the project. The analysis also considered the amount of access/activity where scientifically important paleontological resources are present. The analysis evaluated damage to the project components and subsequent risk to humans and the environment that could result from seismic-related activity, and also evaluated other unique geological phenomena. The potential of the project to restrict or remove from access potential sources of salable mineral resources was also evaluated.

Compliance with the laws, ordinances, regulations, and standards associated with the project components and location were considered during the evaluation process. Impacts resulting from the proposed project and its alternatives, whether direct or indirect, were identified and the associated feasible, reasonable, and practical mitigation measures to avoid or minimize those identified impacts are proposed in this document.

3.6.3.2 CEQA Impact Criteria

Under CEQA, the proposed project would have a significant impact if it would:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving (i) rupture of a known earthquake fault; (ii) strong seismic ground shaking; (iii) seismic-related ground failure, including liquefaction; or (iv) landslides;

b. Result in substantial soil erosion or loss of topsoil;

c. 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;

d. Be located on expansive soil as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;

e. 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;

f. 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; or

g. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

3.6.3.3 Methodology

The geology, soils, minerals, and paleontology impacts of the proposed project are discussed below under subheadings corresponding to each of the significance criterion presented in the preceding section. The analysis describes the impacts of the proposed project related to geologic hazards, soils, minerals, and paleontological resources for each criterion. The analysis also determines whether implementation of the project would result in significant impacts by evaluating effects of construction and operation against the affected environment described above in Section 3.6.1.

The potential impact to the geology, soils, minerals, and paleontological resources resulting from the project was evaluated in two ways. First, geologic hazards were assessed that could impact the proper functioning of the proposed facility and create life/safety concerns. Second, the potential impacts of the proposed facility on existing geologic, mineralogical, and paleontological resources in the area were evaluated. Available published resources including books, journals, maps, and government websites were reviewed. This information was evaluated within the context of the applicable federal, state, and local regulations. In addition, information in the Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS) prepared for the proposed ISEGS project located near the proposed Ivanpah Substation was also evaluated. Published geologic maps and reports provided information on regional and project-specific geology. Geologic maps used included quadrangles at various scales from 1:50,000 to 1:250,000 and state-wide maps at a scale of 1:750,000. The geologic units identified in the geologic mapping were not consistent either between Nevada and California or by mapped scale. For example, some maps identified only surficial units, while others indicated both surficial units and bedrocks. Mapping of the surficial units also varied in level of detail and segregation. This analysis tended more to generalizing (grouping) the numerous alluvial surficial units while maintaining the unique identity between units of different genesis. Other important sources were government websites, including databases maintained and updated by both federal and state governmental agencies providing information on topics such as seismic hazards, faulting, and soil classification.

To evaluate potential paleontological impacts due to construction of the transmission lines, substation, and other facilities, the BLM's PFYC system was used. This system rates the potential of each geologic unit to yield significant fossils. The BLM established the PFYC system to quantify the occurrence of paleontological resources on public lands and the risk of impacting them. Geologic units are assigned a classification between 1 (lowest) and 5 (highest). The PFYC system is used by the BLM to assess impacts to paleontological resources and suggest appropriate mitigation measures. Additionally, a paleontological records and literature search was conducted. Pertinent published literature and unpublished manuscripts on the geology and paleontology of eastern California (San Bernardino County) and southern Nevada (Clark County) were reviewed. These included published articles on late Pleistocene vertebrate localities of California (Jefferson 1991a and 1991b) and Nevada (Jefferson et al. 2004). An online records search was conducted at the Museum of Paleontology, University of California, Berkeley (~~Museum of Paleontology, University of California, Berkeley,~~ 2009 and 2010, in Scott and Gust [2010]) and through the database of the Invertebrate Paleontology Section of the Natural History Museum of Los Angeles County (Scott and Gust 2010)~~)~~. Also, persons with knowledge of the geology and paleontological resources of the proposed project area were consulted.

3.6.3.4 Applicant Proposed Measures

The applicant would implement the applicant proposed measures (APMs) described below to reduce adverse effects to geologic, soil, minerals, and paleontological resources and reduce impacts from geologic hazards.

APM GEO-1: Geotechnical Engineering and Engineering Geology Study. 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: Recommended Practices for Seismic Design of Substations. For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronics Engineers Standard 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.

APM GEO-3: Project Construction Stormwater Pollution Prevention Plan Protection Measures Regarding Soil Erosion/Water Quality. 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 stormwater pollution prevention plan (SWPPP). New access roads would be designed to minimize ground disturbance from grading. They would follow natural ground contours as closely as possible, and would include specific features for road drainage. Measures could include water bars, drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings would be constructed, they would be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.

APM PALEO-1: Retention of Paleontologist and Preparation of a Paleontological Resource Management Plan. Prior to construction, a certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a Paleontological Resource Management and Monitoring Plan (PRMMP) for the proposed project. This PRMMP would be prepared and implemented under the direction of the paleontologist and would address and incorporate APMs PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine whether 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 could be found in the PRMMP.

APM PALEO-2: Pre-construction Paleontological Field Survey. The paleontologist and/or his or her designated representative would 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 PRMMP.

APM PALEO-3: Worker Environmental Awareness Program (see BIO-6, CR-2b, W-11). A Worker Environmental Awareness Program 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.

APM 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 would 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 were not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities had reached a depth 5 feet below the present ground surface and fine-grained strata were 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 were present.

APM PALEO-5: Recovery and Testing. If fossils were 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 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 were 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: 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 would be submitted for analysis.

APM PALEO-7: Analysis of and Preparation of Final Paleontological Resource Recovery Report. The project paleontologist would direct identification, laboratory processing, cataloging, 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.

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 final Paleontological Resource Recovery Report in a timely manner following construction.

3.6.3.5 Proposed Project / Proposed Action

<u>Construction</u>

Eldorado–Ivanpah Transmission Line

The potential to expose people to adverse effects due to fault rupture during construction of the transmission line would be negligible, localized, and short term. Fault rupture can result in structural failure that poses a risk to people. The Mesquite segment of the SFS crosses the proposed transmission line route along the California-Nevada border at <u>the Town of</u> Primm nearly perpendicular to the proposed transmission line route, although there is substantial uncertainty about the location of this fault. No other faults within the proposed project area known to have the potential for earthquake ground rupture cross the transmission line route. Due to the infrequent nature of movement along the SFS relative to the construction period, fault rupture resulting in impact to construction of the transmission line would be unlikely. Therefore, the impact to people due to fault rupture would be less than significant without mitigation.

The potential impact on people and structures by exposing them to adverse effects due to seismic ground shaking during construction would be negligible, localized, and short term. Ground movement associated with earthquakes can cause structural damage that poses a risk to human safety. Earthquakes occurring on faults closest to the transmission line would most likely generate the largest ground motion. Applying the Landers earthquake peak ground acceleration data to the Mesquite segment of the SFS, an approximate ground acceleration ranging from 0.12 g to 0.50 g can be expected along the transmission line route, with the higher value possible at the location where this fault crosses the transmission line route. Overall, strong ground shaking would be within the levels experienced in the Landers earthquake area in 1992 and the Hector Mine earthquake in 1999, both in the Mojave Desert region and where electrical transmission lines experienced some damage in each of these earthquakes. Due to the short duration of construction and infrequent nature of significant ground shaking in the project area, potential adverse effects to people associated with seismic ground shaking during construction would be less than significant without mitigation. Additionally, design measures would reduce the impact of risk to people associated with a considerable ground shaking event to less than significant without mitigation.

Seismic-related ground failure is not expected over most of the transmission line route due to the general lack of shallow groundwater. Liquefaction typically occurs primarily in saturated, loose, fine- to medium-grained soils in areas where the groundwater table is within approximately 50 feet of the ground surface; soils may temporarily lose their shear strength during strong ground shaking. Neither the San Bernardino County General Plan Safety Element nor the Clark County Comprehensive Plan indicates liquefaction potential within the project area. The most likely exceptions could be at the playa fringes, where sand layers could be saturated with perched water. In this case, the potential for negligible impact to human safety would be localized and short term; therefore, less than significant impact without mitigation would be expected.

Slope stability (e.g., ~~L~~ potential for landslides and rockfall) effects are assessed in two distinct ways: 1) project development could destabilize a soil or geologic unit and induce a landslide; or 2) project components could be transported in a landslide and introduce additional risk or damage to people or the environment. Construction activities, including service roads, may cause minor adverse conditions suitable for landslides at locations where geologic conditions are susceptible to this type of hazard. These geologic conditions along the transmission line route would be expected to occur in areas on or adjacent to hill slopes. About 10 percent of the proposed transmission line route (in the McCullough Mountains) passes 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. Such movements can have potentially damaging effects. MM GEO-2 requires the applicant to complete a geotechnical analysis to assess site-specific geologic conditions and hazards and adjust engineering and design practices accordingly. Although these conditions would be local in extent, their potential for impact may extend over a long period of time but would be less than significant with mitigation.

Activities associated with construction of access road and tower footings along the transmission line route would disturb the existing ground surface and natural drainage(s), causing minor adverse erosion-related adverse impacts at these locations. This adverse impact would be localized and expected to act over the entire construction period. As required by law, the applicant would adhere to a SWPPP (APM GEO-3). MM W-1 (Erosion Control Plan and Compliance with Water Quality Permits) would further reduce potential adverse impacts related to soil erosion. Therefore, this impact would be less than significant with mitigation.

Construction of the transmission line route in areas of unstable geologic units or expansive soil could result in further destabilization of geologic units and/or structural failure of the towers. The adverse impacts of construction in these areas, ranging from negligible to minor over most of the transmission line route, could be localized to extensive, depending on conditions and type of impact. For example, the impact to existing surface topography related to subsidence due to groundwater withdrawal would be possible if substantial pumping were to occur related to development in the region~~;~~. The continued and/or increased groundwater withdrawal from the Ivanpah and Eldorado valleys may cause an overdraft condition resulting in settling of the ground surface due to compaction of underlying unconsolidated sediments. ~~resulting in u~~Unsafe changes in surface topography could result. For example, the dehydration of clays between the soil surface and the water table could result in local sinkholes due to these potential fluctuations in hydrology. Impact to towers due to earthquake-induced ground cracking would be negligible to non-existent for transmission line towers with deep foundations. Expansive soils, which shrink or swell with changes in moisture content and can affect the stability of foundations, could be encountered. Soils along the transmission line route in Nevada exhibit expansion potential that is generally low or low to moderate, with one united rated as moderate to high (playa). In the California portions of the project area, the potential for expansive soils is generally low to moderate, with one unit rated as high (playa). MM GEO-2 requires the applicant to complete a geotechnical analysis to assess site-specific geologic conditions and hazards and adjust engineering and design practices accordingly. MM GEO-4 requires the applicant to expand on the geotechnical analysis to mitigate specifically for expansive soils. These potential impacts from expansive soils on project structures would be less than significant with mitigation.

Numerous non-metallic and metallic mineral deposits occur along or near the transmission line route. No mining of metallic deposits was identified within 1,000 feet of the proposed transmission line project area. ~~Non~~Metallic and non-metallic deposits within the general project area include rare earth minerals from the Molycorp Mine, pumice, feldspar, limestone, and sand and gravel, with sand and gravel potential being the highest along the routes. There are a few past and current mining locations in the vicinity of the proposed project, but none identified in the USGS database as located within 1,000 feet of either side of the proposed transmission line route or alternative routes. Any adverse impacts to the availability of currently ~~-~~identified mineral resources would be negligible; the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project area would result in a less than significant impact to no impact without mitigation.

Construction of the transmission line could cause direct impacts to buried paleontological resources due to ground-disturbing activities. The potential for direct impacts to paleontological resources during construction of the transmission line would be adverse, negligible, area-wide, and short term. Preconstruction ground-disturbing activities (augering and trenching) as part of geotechnical investigations of transmission tower locations might impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. During tower construction, ground-disturbing activities such as augering and trenching for support footings and grading for tower pads, service roads, and staging areas might impact paleontological resources in areas where underlying formations have high paleontological sensitivity. The rock units of ~~high~~unknown paleontological sensitivity (see Table 3.6-6) along the proposed line route are Quaternary alluvium, or ~~(~~Qa/Qal (within a mile of the Quaternary Lake/Playa deposits [Ql/Qp])~~,~~ and Quaternary lake/playa deposits (Ql/Qp). ~~All other underlying rock units present along the proposed transmission line, including ancient~~The Quaternary Older Alluvium (Qoa) and Tertiary volcanic (Tba) rocks are of low paleontological sensitivity. Ancient intrusive and metamorphic rocks (Xm; undivided Proterozoic) and Tertiary volcanic (Tba) rocks are of very low paleontological sensitivity. However, as part of construction of the proposed project, the applicant would implement APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, possible impacts would be less than significant without mitigation.

Ivanpah Substation

The potential impact on people and structures by exposing them to adverse effects of fault rupture during construction of the Ivanpah Substation would not be expected since known faults do not cross the site. However, the potential does exist for exposure of people to adverse effects of seismic ground shaking during construction. Although considered minor and negligible, earthquakes occurring on SFS would most likely generate the largest ground motion (up to 0.35 g), similar to the motion that would be experienced by the transmission line route. Any impact experienced would be short term and localized, although an earthquake event would affect a larger region. Due to the infrequent nature of movement along the SFS relative to the short duration of the construction period, the impact of fault rupture on people would be less than significant without mitigation.

Seismic-related ground failure is not expected in the substation area due to the general lack of shallow groundwater. Construction activities related to the substation would not be expected to cause temporary conditions suitable for landslides, nor would service roads expose people or structures to adverse landslide effects, because the topography slopes gently at this location.

Construction associated with access roads and the substation would disturb the existing ground surface and natural drainage(s), causing a minor, adverse impact of erosion or loss of topsoil that would be localized but could act over a long term. Grading at the substation location would be permitted as part of the ISEGS project. MM W-6 requires the applicant to submit the ISEGS Drainage, Erosion, and Sedimentation Control Plan (DESCP) and SWPPP to CPUC. Implementation of proper engineering control measures outlined in the DESCP and SWPPP, this impact would be less than significant with mitigation.

The proposed location of the substation is in an area that may be susceptible to subsidence caused by removal of groundwater, to sinkholes due to dehydration of clays between the soil surface and the water table, and to ~~in an area of~~ expansive soil. Construction in such an area may result in negligible to minor impacts of local extent; subsidence could occur over a more extensive area with the impact to the proposed project being localized to the substation. Expansive soils shrink or swell with changes in moisture content, affecting the stability of foundations. Either impact would have a long-term effect on the project. MM GEO-2 requires the applicant to complete a geotechnical analysis to assess site-specific geologic conditions and hazards and adjust engineering and design practices accordingly. With the implementation of proper engineering control measures, this impact would be less than significant with mitigation.

Non-metallic mineral deposits occur near the proposed substation area. Any currently identified adverse impacts to the availability of mineral resources would be negligible; the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project area would result in a less than significant impact to no impact on the availability of currently-identified mineral resources. Non-metallic deposits within the general project area include rare earth minerals from the Molycorp Mine, pumice, feldspar, limestone, and sand and gravel, with sand and gravel potential being the highest. There are a few past and current mining locations in the vicinity of the proposed project, but none located within 1,000 feet of the substation. Any adverse impacts are negligible; the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project area would result in a less than significant impact or no impact.

Construction of the Ivanpah Substation could cause direct impacts to buried paleontological resources due to ground-disturbing activities. The potential for direct impacts to paleontological resources during construction of the Ivanpah Substation would be adverse, negligible, localized, and short term. Preconstruction ground-disturbing activities (augering and trenching) as part of geotechnical investigations of substation foundation(s) might impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. Ground-disturbing activities such as grading and trenching the substation foundation(s), attendant facilities, and utilities could impact paleontological resources in areas where underlying formations have high paleontological sensitivity. ~~The rock~~Rock units of ~~high~~low paleontological sensitivity (see Table 3.6-6) within the substation footprint are Quaternary non-marine or older alluvium (Qc/Qoa) and Quaternary alluvium (Qa/Qal). However, as part of construction of the proposed project, the applicant would include APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, impacts would be less than significant without mitigation.

Telecommunications Line

The potential impact to people and structures by exposing them to adverse effects due to fault rupture during construction of the telecommunications line would be non-existent since the proposed route does not cross any active faults. However, the potential to expose people to adverse effects due to seismic ground shaking during construction would be negligible, localized, and short term. Earthquakes occurring on faults closest to the telecommunications line route would most likely generate the largest ground motion, with expected approximate ground acceleration ranging from 0.12 g to 0.45 g. Overall, strong ground shaking would be within the levels experienced in the Landers earthquake area in 1992 and the Hector Mine earthquake in 1999, both in the Mojave Desert region, where some damage in each of these earthquakes was experienced. Design considerations can be implemented so the impact would be less than significant without mitigation.

Seismic-related ground failure is not expected in the project area due to the general lack of shallow groundwater along the proposed route. Construction activities, including service roads, may cause temporary conditions suitable for landslides at locations where geologic conditions are susceptible to this type of hazard. These geologic conditions along the telecommunications line route would be expected to occur in areas on or adjacent to hill slopes. About 10 percent of the proposed telecommunications line route (along the southern end of the McCullough Mountains) passes 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. Such movements can have potentially damaging effects. These conditions would be local in extent, but their potential for impact on the project could extend over a long period of time. MM GEO-2 requires the applicant to complete a geotechnical analysis to assess site-specific geologic conditions and hazards and adjust engineering and design practices accordingly. The impact of these conditions would be less than significant with mitigation.

Activities associated with the construction of access roads and tower footings along the proposed telecommunications line route would disturb the existing ground surface and natural drainage(s), causing minor adverse erosion-related impact at these locations. This impact would be localized but expected to act over the entire construction period. However, with the implementation of proper engineering control measures such as those outlined in the SWPPP, this impact would be less than significant with mitigation.

Construction of the proposed telecommunications line route in areas of unstable geologic units or expansive soil could result in further destabilization of geologic units and/or structural failure of the towers. The adverse impacts of construction in these areas, ranging from negligible to minor over most of the telecommunications line route, could be localized to extensive, depending on conditions and type of impact. For example, the impact to existing surface topography related to subsidence due to groundwater withdrawal would be possible if substantial pumping were to occur related to construction of the proposed project; continued and/or increased groundwater withdrawal from the Ivanpah and Eldorado valleys may cause an overdraft condition resulting in settling of the ground surface due to compaction of underlying unconsolidated sediments resulting in unsafe changes in surface topography. Impact to telecommunication structures due to earthquake-induced ground cracking would be negligible to no impact for towers with deep foundations. Expansive soils, which shrink or swell with changes in moisture content and can affect the stability of foundations, could be encountered. Soils along the telecommunications line route in Nevada exhibit expansion potential that is generally low or low to moderate, with one unit rated as moderate to high (playa). In the California portions of the project area, the potential for expansive soils is generally low to moderate, with one unit rated as high (playa). MM GEO-2 requires the applicant to complete a geotechnical analysis to assess site-specific geologic conditions and hazards and adjust engineering and design practices accordingly. MM GEO-4 requires the applicant to expand on the geotechnical analysis to mitigate specifically for expansive soils. These potential impacts from expansive soils on project structures would be less than significant with mitigation.

Numerous non-metallic and metallic mineral deposits occur along or near the telecommunications line route. No mining of metallic deposits was identified within 1,000 feet of the proposed project area, except that the aboveground portion of the Mountain Pass Telecommunication Alternative would go through the Molycorp Mine. Non-metallic deposits within the general project area include rare earth minerals, pumice, feldspar, limestone, and sand and gravel, with sand and gravel potential being the highest along the routes. There are a few past and current mining locations in the vicinity of the proposed project, but other than the Molycorp Mine, none would be located within 1,000 feet of either side of the proposed telecommunications line route or alternative routes. Any adverse impacts to the availability of currently-identified mineral resources would be negligible; the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project area would result in a less than significant impact to no impact.

Construction of the redundant telecommunication system (partially underground) could cause direct impacts to buried paleontological resources due to ground-disturbing activities associated with trenching and tower placement. The potential for direct impacts to paleontological resources during construction of the redundant telecommunication system would be adverse, moderate, area-wide, and short term. Preconstruction ground-disturbing activities (augering and trenching) performed as part of geotechnical investigations along the route of the telecommunications line could impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. During construction, ground-disturbing activities such as trenching for installation and burial of the line could impact paleontological resources in areas where underlying formations have high paleontological sensitivity. ~~The rock~~Rock units of ~~high~~unknown paleontological sensitivity (see Table 3.6-6) along the proposed telecommunication line route are Quaternary alluvium (Qa/Qal) within a mile of the playas and Quaternary lake/playa deposits (Ql/Qp). All other underlying rock units present along the proposed transmission line that include Ancient intrusive and metamorphic rocks (Xm;

undivided Proterozoic) and Tertiary volcanic (Tba) rocks are of low paleontological sensitivity. However, as part of construction of the proposed project, the applicant would implement APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, possible impacts would be less than significant without mitigation.

Because the primary -telecommunication line would be above ground and strung along the transmission towers, construction would not result in any additional impacts to buried paleontological resources. These possible impacts would be less than significant.

Operation & Maintenance

Eldorado–Ivanpah Transmission Line

The potential impact to people and structures by exposing them to adverse effects due to fault rupture and/or seismic ground shaking during the operation and maintenance would be negligible during the life of the proposed project. Fault rupture, although unlikely due to movement on the SFS or the Black Hills fault, ~~can~~ could result in structural failure that poses a risk to people. Although the probability of some occurrence of seismic ground shaking increases as longer time periods are considered, the likelihood of exposing people to adverse effects still remains negligible. Seismic-related ground failure such as liquefaction would not be expected in the project area due to the general lack of shallow groundwater, although areas in the valley bottoms (old lake deposits and playas) could pose a negligible impact; therefore, the impact would be less than significant without mitigation.

Maintenance of service roads could expose people or structures to minor adverse slope stability (e.g., landslides and rockfall) ~~landslide~~ effects over the life of the proposed project. In addition, operation and maintenance activities could expose people and structures to landslide hazards during the life of the project. Geologic conditions along the transmission line route favorable to landslides would be expected to occur in areas on or adjacent to hill slopes (in the McCullough Mountains and the hills west of the Town of Primm), particularly where access roads have been built. Although these landslide-prone conditions would be local in extent, their potential for impact could extend over a long period of time. The impact of landslide conditions on the project would be less than significant with mitigation. Operation and maintenance of service roads would cause continued ground disturbance that would result in sites of potential erosion, particularly in areas of hill slopes. These activities would continue to disturb the existing ground surface and natural drainage(s), causing minor adverse erosion-related impact. This impact would be localized but would act over the entire life of the proposed project. However, with the implementation of proper engineering control measures, this impact would be less than significant without mitigation.

The proposed transmission line could experience adverse negligible to minor impacts during operation and maintenance due to subsidence related to potentially unstable geologic units or expansive soil causing structural failure of the towers. These impacts could be localized to extensive, depending on geologic conditions and degree of subsidence. For example, subsidence due to groundwater withdrawal would be possible due to substantial pumping; continued and/or increased groundwater withdrawal from the Ivanpah and Eldorado valleys may cause an overdraft condition, resulting in settling of the ground surface due to compaction of underlying unconsolidated sediments. As part of MM GEO-1, the applicant will contact the California Department of Water Resources and the Nevada Division of Water Resources on an annual basis to determine if groundwater withdrawals in the area are causing ground subsidence or sinkholes. If subsidence or sinkholes are found and threaten~~s~~ any project facility, the applicant will develop a mitigation plan to prevent damage to structures. However, with the implementation of proper engineering control measures, this impact from subsidence on project structures would be less than significant with mitigation.

Numerous non-metallic and metallic mineral deposits occur along or are near the transmission line route; however, no mining of these deposits was identified within 1,000 feet of the proposed project area. Any adverse impacts to the availability of currently-identified mineral resources would be negligible; the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project area would result in less than significant impacts.

Operation and maintenance of the proposed project would not result in additional ground disturbance beyond the areas disturbed during construction. Areas where fossils are located would be identified during preconstruction surveys and construction monitoring. Therefore, there would be no additional potential impacts to paleontological resources during operation and maintenance.

Ivanpah Substation

The potential impact to people and structures by exposing them to adverse effects due to fault rupture during operation and maintenance of the substation would not be expected, since known faults do not cross the site. However, the potential does exist for the negligible exposure of people and structures to adverse effects due to seismic ground shaking during the operation and maintenance of the substation. Earthquakes occurring on faults closest to the substation (such as the SFS) would most likely generate the largest ground motion (up to 0.35 g), similar to that experienced by the transmission line route. Any impact experienced would be short term and localized, although the causative event would affect a larger region. However, design considerations (APM GEO-2 Recommended Practices for Seismic Design of Substations) would be implemented so the impact would be less than significant without mitigation.

Operation and maintenance activities associated with the substation and access roads would disturb the existing ground surface and cause minor adverse erosion impacts that would be localized in extent but could be long term. Erosion could result from re-directed stormwater and wind. However, with the implementation of proper engineering control measures, this impact would be less than significant without mitigation.

The proposed location of the substation is in an area that may be susceptible to subsidence caused by the removal of groundwater and in an area of expansive soil. This could cause a negligible to minor adverse impact to the project during its operation and maintenance. Although expected to be of local extent; subsidence could occur over a more extensive area. The long-term impact on the project; however, with the implementation of proper engineering control measures, would be less than significant with mitigation.

Numerous non-metallic and metallic mineral deposits occur along or are near the proposed substation; however, no mining of these deposits was identified within 1,000 feet of the proposed project. Any adverse impacts to the availability of currently-identified mineral resources would be negligible; the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project would result in less than significant impacts.

Operation and maintenance of the proposed project would not result in additional ground disturbance beyond the areas disturbed during construction. Areas where fossils are located would be identified during preconstruction surveys and construction monitoring. Therefore, there would be no additional potential impacts to paleontological resources during operation and maintenance.

Telecommunications Line

Operation and maintenance of the telecommunications line would result in impact conditions consistent with the operation and maintenance of the transmission line.

The potential impact to people and structures by exposing them to adverse effects of fault rupture and/or seismic ground shaking during operation and maintenance would be negligible during the life of the proposed telecommunications line. Fault rupture, although unlikely due to movement on the SFS or the Black Hills fault, could ~~can~~ result in structural failure that poses a risk to people. Although the probability of an occurrence of seismic ground shaking increases as longer periods of time are considered, the likelihood of exposing people to adverse effects still remains negligible. Seismic-related ground failure such as liquefaction is not expected in the project area due to the general lack of shallow groundwater, although areas in the valley bottoms (old lake deposits and playas) may pose a negligible potential for a highly localized impact.

Maintenance of service roads could expose people or structures to minor adverse ~~landslide~~ slope stability (e.g., landslides and rockfall) effects over the life of the proposed telecommunications line. In addition, operation and maintenance activities could expose people to landslide hazards during the life of the project. Geologic conditions along the telecommunications line route favorable to landslides would be expected to occur in areas on or adjacent to hill slopes (in the McCullough Mountains and the hills west of the Town of Primm), particularly where access roads have been built. Although these landslide-prone conditions would be local in extent, their potential for impact may extend over a long period of time. The impact of these conditions on the project would be less than significant with mitigation. Operation and maintenance of service roads would lead to continued ground disturbance that would result in sites of potential erosion, particularly in areas of hill slopes. These activities would continue to disturb the existing ground surface and natural drainage(s) over the entire life of the proposed project, causing minor adverse erosion-related impacts. However, with the implementation of proper engineering control measures, this impact would be less than significant with~~out~~ mitigation.

The proposed telecommunications line may experience adverse negligible to minor impacts during the operation and maintenance period due to subsidence related to potentially unstable geologic units or expansive soil causing structural failure of the towers. The impacts from subsidence or expansive soil to the towers could be localized to extensive, depending on geological conditions and degree of subsidence. Subsidence due to groundwater withdrawal is possible due to substantial pumping and due to dehydration of clays between the soil surface and the water table; continued and/or increased groundwater withdrawal from the Ivanpah and Eldorado valleys could cause an overdraft condition resulting in the settling of the ground surface due to compaction of underlying unconsolidated sediments. As part of MM GEO-1, the applicant will contact the California Department of Water Resources and the Nevada Division of Water Resources on an annual basis to determine if groundwater withdrawals in the area are causing ground subsidence. If subsidence threatens any project facility, the applicant will develop a mitigation plan to prevent damage to structures. However, with the implementation of proper engineering control measures, this impact on project structures would be less than significant with mitigation.

Numerous non-metallic and metallic mineral deposits occur along or are near the telecommunications line route; however, no mining of these deposits was identified within 1,000 feet of the proposed project area. In the region, the potential resource is area-wide but would be only locally developed. The development of mineral deposits within the proposed project area would result in less than significant impacts without mitigation.

Operation and maintenance of the proposed project would not result in additional ground disturbance beyond the areas disturbed during construction. Areas where fossils are located would be identified during preconstruction surveys and construction monitoring. Therefore, there would be no additional potential impacts to paleontological resources during operation and maintenance.

NEPA Summary

The proposed project would result in direct negligible to minor geology- and soils-related impacts due to the construction of the transmission line, substation, and telecommunications line. The impacts would be local in extent for most of the proposed project, but could be extensive to area-wide. The impacts would occur over either short- or long-term time spans. Impacts associated with operation and maintenance of the transmission line, substation, and telecommunications line would mostly be related to the occasional presence of people engaged in maintaining the facilities during the life of the project, and would be potentially due to changing geologic conditions including seismic events (fault rupture and ground shaking), subsidence, and/or liquefaction.

The proposed project would result in direct negligible impacts to paleontological resources during construction of the transmission line, substation, and telecommunications line. However, as part of construction of the proposed project, the applicant would include APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring;

and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, possible impacts would be less than significant. Operation and maintenance of the proposed project would not result in additional ground disturbance beyond the areas disturbed during construction. Therefore, there would be no impacts to paleontological resources during operation and maintenance.

CEQA Significance Determinations

IMPACT GEO-1: Rupture of Earthquake Fault Across the Transmission Line Route

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The proposed project would result in impacts related to the potential for damage to transmission line towers resulting from the rupture of an earthquake fault that crosses the transmission line route. The potential for exposure of people to fault rupture during construction of the transmission line is very low. The Mesquite segment of the SFS crosses the proposed transmission line route along the California-Nevada border at the Town of Primm nearly perpendicular to the proposed transmission line route, although there is substantial uncertainty as to the location of this fault. No other faults within the proposed project area known to have the potential for earthquake ground rupture cross the transmission line route, and APM GEO-1 states that the applicant would complete a geotechnical engineering and engineering geology study to identify site-specific geologic conditions and potential geologic hazards prior to final engineering. MM GEO-2 strengthens APM GEO-1 by stating that the applicant will use the findings of the geotechnical analysis to guide engineering and design. Therefore, the impact would be less than significant with mitigation.

The potential for exposing people to adverse effects of fault rupture during operation and maintenance is also unlikely during the life of the proposed project. Although the probability of an earthquake occurring increases as longer time periods are considered, the likelihood of exposing people to adverse effects still remains negligible. Given the relative lack of active faults in the project area and the fact that the applicant would conduct preconstruction geotechnical engineering and engineering geology studies, the impact would be less than significant without mitigation.

IMPACT GEO-2: Exposure of People or Structures to Potential Adverse Effects Due to Seismic Ground Shaking

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The project could impact people and structures by exposing them to adverse effects due to seismic ground shaking during construction. Earthquakes occurring on faults closest to the transmission line and substation facility would most likely generate the largest ground motion experienced at that location. Estimated approximate ground accelerations range from 0.12 g to 0.50 g for the transmission line route, could be up to 0.35 g for the substation facility, and range from 0.12 g to 0.45 g along the telecommunications route. Due to the short nature of construction and infrequent nature of significant ground shaking in the project area, potential adverse effects to people associated with seismic ground shaking during construction would be less than significant without mitigation. Additionally, design measures would reduce the impact of risk to people associated with a considerable ground shaking event to less than significant without mitigation. Design considerations outlined in APM GEO-2 (Recommended Practices for Seismic Design of Substations) would further lessen the potential for adverse effects due to seismic ground shaking at the substation to less than significant levels without mitigation.

The potential exists to expose people and structures to adverse effects of seismic ground shaking during operation and maintenance of the facilities. Earthquakes occurring on faults closest to the proposed project would most likely generate the largest ground motion experienced by the transmission line route, substation, and telecommunications line. However, although the probability of an occurrence of seismic ground shaking increases as longer time periods are considered, the likelihood that people would be exposed to adverse effects is limited; structures would be more likely to experience an impact. Any impact would be short term and localized for the proposed project, although the causative event would affect a larger region. Design considerations outlined in APM GEO-2 would lessen the potential for adverse effects due to seismic ground shaking at the substation to less than significant levels without mitigation. MM GEO-1 requires the applicant to design structures to withstand site-specific geologic conditions. With this mitigation measure in place, potential adverse effects to people and structures associated with ground shaking would be reduce to less than significant levels with mitigation.

IMPACT GEO-3: Exposure of People or Structures to Potential Adverse Effects Due to Seismic-Related Ground Failure

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The proposed project would result in impacts on people and structures due to seismic-related ground failure only for those areas where conditions are potentially conducive to ground failure. Areas within the proposed project area that may be susceptible to seismic-related ground failure during construction include structures located at or near playa fringes, where sand layers could be saturated with perched water. In this case, the potential for negligible impact would be highly localized. For most of the proposed project area, seismic-related ground failure is not expected, due to the general lack of shallow groundwater. In addition, neither the San Bernardino County General Plan Safety Element nor the Clark County Comprehensive Plan indicates liquefaction potential within the proposed project area.

The potential exists for exposure of people or structures to seismic-related ground failure during operation and maintenance of the proposed project. Areas within the proposed project near playa fringes where sand layers could be saturated with perched water are the most likely places for this impact to occur. For most of the proposed project area, seismic-related ground failure would not be expected due to the general lack of shallow groundwater. In addition, neither the San Bernardino County General Plan Safety Element nor the Clark County Comprehensive Plan indicates liquefaction potential within the proposed project area. APM GEO-1 states that the applicant would complete a geotechnical engineering study to identify site-specific geologic conditions and potential geologic hazards prior to final engineering; therefore, the impact would be less than significant without mitigation.

IMPACT GEO-4: Exposure of People or Structures to Adverse Effects Due to Landslides

ess than signifi ant itho t itigation

The proposed project would result in impacts on people or structures along the access roads for the transmission line and telecommunication line routes during construction. Installing, upgrading, or re-grading access roads could lead to landslides at locations where geologic conditions are conducive to this type of hazard. Such geologic conditions occur in areas on or adjacent to hill slopes. About 10 percent of the proposed transmission line route (in the McCullough Mountains) and the telecommunications line route (along the southern end of the McCullough Mountains) passes 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. Such movements can have potentially damaging effects. Although these conditions would be local so the impact from construction-caused landslides on people or structures would be localized, the potential for these impacts could extend over a long time.

In addition, operation and maintenance activities could expose people and structures to landslide hazards during the life of the project. Geologic conditions along the transmission line and telecommunications line routes favorable to landslides would occur in areas on or adjacent to hill slopes, particularly where access roads have been built and maintained. Although these conditions would be local so the impact from operation- or maintenance-caused landslides on people or structures would be localized, the potential for these impacts could extend over a long time. APM GEO-1 states that the applicant would complete a geotechnical engineering study to identify site-specific geologic conditions and potential geologic hazards prior to final engineering. MM GEO-2 requires the applicant to complete a incorporate the results of the geotechnical analysis to assess site-specific geologic conditions and hazards and adjust engineering and design practices accordingly. Therefore, the impact would be less than significant with mitigation.

IMPACT GEO-5: Erosion of Soil at Towers and the Substation and Along Access Roads
ess than signifi ant ith itigation

The proposed project would impact soil by resulting in erosion at the transmission and telecommunication towers, at the substation, and along the access roads. Construction of access roads and tower footings along the transmission line and telecommunications line routes would disturb the existing ground surface and natural drainage(s), causing minor adverse erosion-related impacts on soil at these locations. This impact would be localized but would act over the entire construction period.

Operation and maintenance of transmission and telecommunication line service roads would lead to continued ground disturbance that would result in sites of potential erosion, particularly in areas of hill slopes. These activities would continue to disturb the existing ground surface and natural drainage(s), causing minor adverse erosion-related impacts on soil and water resources (further discussed in Section 3.8, "Hydrology and Water Resources"). Erosion associated with the substation could result from re-directed stormwater and wind. This impact would be localized (hilly areas and substation area) but could act over the life of the proposed project. Although a SWPPP would be followed (APM GEO-3), impacts soil conditions due to construction and operation of the project could be significant. With the implementation of MM W-1, however, impacts under this criterion would be less than significant.

IMPACT GEO-6: Structural Failure of Towers and Substation Facility Due to Unstable Soil Conditions Resulting in Subsidence or Collapse
ess than signifi ant ith itigation

Ground subsidence or collapse due to groundwater withdrawal or dehydration of clays between the soil surface and the water table could lead to the structural failure of the transmission line and telecommunication line towers and substation facility. This adverse impact on the project, ranging from negligible to minor, could be localized to extensive, depending on the degree to which continued and/or increased groundwater withdrawal from the Ivanpah and Eldorado valleys causes an overdraft condition or dehydration resulting in settling of the ground surface due to compaction of underlying unconsolidated sediments. The likelihood of this impact could increase over time with continued and/or increased groundwater withdrawal. Although prior to final design a geotechnical engineering study would be performed (APM GEO-1), impacts on proposed project facilities could still be significant. With the implementation of MM W-2, MM GEO-1 and MM GEO-2, however, impacts under this criterion would be less than significant.

IMPACT GEO-7: Structural Failure of Towers or Substation Facility Due to Expansive Soils
ess than signifi ant ith itigation

Building on expansive soils could lead to the structural failure of the transmission line and telecommunication line towers and substation facility. Expansive soils shrink or swell with changes in moisture content, affecting the stability of foundations. Soils encountered along the transmission line route in Nevada exhibit expansion potential that is generally low and low to moderate, but the expansion potential along the route is moderate to high in one unit (playas). In California, the potential for expansive soils is generally low to moderate, but also is high in one unit (playas). The areas most prone to experience expansive soils lie within or adjacent to playas or old lake deposits with clay rich sediments. Although prior to final design a geotechnical engineering study would be performed (APM GEO-1), impacts on proposed project facilities could be significant. With the implementation of MM GEO-4, however, impacts under this criterion would be less than significant.

IMPACT MR-1: Loss of Mineral Resource of Value to Region and the Residents of the State
ess than signifi ant itho t itigation

Numerous non-metallic and metallic mineral deposits occur along or near the telecommunications line route. No mining of metallic deposits was identified within 1,000 feet of the proposed project. Non-metallic deposits within the general project area include rare earth minerals from the Molycorp Mine, pumice, feldspar, limestone, and sand and gravel, with sand

and gravel potential being the highest along the routes. There are a few past and current mining locations in the vicinity of the proposed project, but none, except the aboveground portion of the Mountain Pass Telecommunications Alternative, would be ~~are~~ within 1,000 feet of either side of the proposed telecommunications line route. The Molycorp Mine would be within 1,000 feet of the Mountain Pass Telecommunications line ~~or~~ alternative route~~s~~. Proposed future activities at mines can easily avoid the proposed project area. Any identified adverse impacts at current mines are negligible. The potential for mineral resources in the project vicinity is area-wide. However, since no specific locations for valuable mineral resources have been identified within the project area, there would be no loss of availability of a known mineral resource as a result of the proposed project. Impacts under this criterion would be less than significant without mitigation.

NO IMPACT. Loss of Locally Important Mineral Resource Recovery Site Delineated on a Local General Plan, Specific Plan, or Other Land Use Plan. The proposed project would have no impact under this criterion because there are no identified mineral resources delineated on a local general plan, specific plan, or other land use plan that would result in loss of availability due to the construction, operation, or maintenance of the proposed project.

IMPACT PALEO-1: Direct or Indirect Damage or Destruction of Paleontological Resources
ess than signifi ant itho t itigation

The proposed project would include ground disturbance that could impact buried and undiscovered paleontological resources. Various actions would help reduce impacts on paleontological resources discovered during the preconstruction and construction phases of the proposed project. These actions include APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, impacts would be less than significant without mitigation.

3.6.3.6 No Project / No Action Alternative

In the No Project/No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multi-role use, sustained yield, and maintenance of environmental quality [43 USC 1781 (b)] in conformance with applicable statutes, regulations, policy, and land use plans.

Under the No Project / No Action Alternative, the impacts of the proposed project would not occur. However, except for the Ivanpah Substation, the land on which the project is proposed would not become available to other uses that are consistent with BLM's land use plan. The No Project / No Action Alternative would leave the proposed project area in its current use and would therefore have no additional effect on existing geologic or paleontological resources in the area other than to maintain their availability for potential future development. No impacts would occur.

3.6.3.7 Transmission Alternative Route A

Transmission Alternative Route A is similar to the proposed transmission line route in that it is located in similar geology, soils, and mineralogical materials. It is also similar in topography. Several direct impacts would be associated with this alternative route. Negligible localized short-term impacts would include those associated with seismic ground shaking and seismic-related ground failure. With the implementation of APMs GEO-1 and GEO-2, the impacts would be less than significant without mitigation. A minor localized long-term impact to soils from erosion would occur. With the implementation of MM GEO-3, this impact would be less than significant with mitigation. A minor extensive long-term impact on the structures of the alternative route would be associated unstable geologic units (subsidence). With the implementation of MMs GEO-1 and GEO-2, this impact would be less than significant with mitigation. A negligible localized long-term impact would be associated with expansive soil. With the implementation of MM GEO-4, this impact would be less than significant with mitigation. A negligible area-wide long-term impact would be associated with non-metallic mineral resources. However, this impact would be less than significant without mitigation.

Construction of the Transmission Alternative Route A may cause direct impacts to buried paleontological resources due to ground-disturbing activities. Potential direct impacts to paleontological resources during construction of Transmission Alternative Route A would be adverse, negligible, localized, and short term. Preconstruction ground-disturbing activities (augering and trenching) as part of geotechnical investigations along the route of Alternative Route A could impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. During later tower construction, ground-disturbing activities such as augering and trenching for support footings and grading for tower pads, service roads, and staging areas could impact paleontological resources in areas where underlying formations have ~~high~~ low paleontological sensitivity. The rock unit of ~~high~~ low paleontological sensitivity (see Table 3.6-6) along Transmission Alternative Route A is Quaternary alluvium (Qa/Qal). However, as part of construction of the proposed project, the applicant would implement APMs PALEO-1 through PALEO-8. These measures (provision of the project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, impacts would be less than significant without mitigation.

3.6.3.8 Transmission Alternative Route B

Transmission Alternative Route B is similar to the proposed transmission line route in that it is located in similar geology, soils, and mineralogical materials. It is also similar in topography. The direct impacts and mitigation associated with this alternative route are similar to those for Alternative Route A.

3.6.3.9 Transmission Alternative Route C

Transmission Alternative Route C would relocate a portion of the proposed transmission line to the west of the proposed project route, a portion of which crosses near the southern tip of the Spring Mountains near Milepost 2. This route is similar to the proposed transmission line route in this area in that it is located in similar geology, soils, and mineralogical materials. It is also similar in topography. However, the exposed geologic unit at the southern tip of the Spring Mountains includes exposures of Paleozoic- to Mesozoic carbonate (limestone and dolomite) and siliclastic (sandstone, mudstone, and conglomerate) bedrock (MzPzs).

Several direct impacts are associated with this alternative route. The Mesquite segment of the SFS crosses the Transmission Alternative Route C along the California-Nevada border at the Town of Primm nearly perpendicular to the proposed route. This impact to people and structures associated with fault rupture would be negligible and localized, and would be short term relative to construction but long term with respect to operations and maintenance. With the implementation of APM GEO-1, this impact would be less than significant without mitigation. Negligible localized short-term impacts related to this alternative route include those associated with seismic ground shaking and seismic-related ground failure. With the implementation of APMs GEO-1 and GEO-2, impacts would be less than significant without mitigation. A minor localized long-term impact on soils would be associated with erosion. With the implementation of MM GEO-3, this impact would be less than significant with mitigation. A minor extensive long-term impact would be associated with unstable geologic units (subsidence). With the implementation of MMs GEO-1 and GEO-2, this impact would be less than significant with mitigation. A negligible, localized, long-term impact on project structures would be associated with expansive soil. With the implementation of MM GEO-4, this impact would be less than significant with mitigation. The project could result in a negligible, area-wide, long-term impact to the availability of currently-identified non-metallic mineral resources. However, since no specific locations for valuable mineral resources have been identified within the project area, there would be no loss of availability of a known mineral resource as a result of the proposed project. This impact would be less than significant without mitigation.

Construction of the Transmission Alternative Route C could cause direct impacts to buried paleontological resources from ground-disturbing activities. Potential direct impacts to paleontological resources during construction of Transmission Alternative Route C would be adverse, negligible, localized, and short term. Preconstruction ground-disturbing activities (augering and trenching) as part of geotechnical investigations along the route could impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. During later tower construction, ground-disturbing activities such as augering and trenching for support footings and grading for tower pads, service roads, and staging areas could impact paleontological resources in areas where underlying formations have ~~high~~ unknown and low paleontological sensitivity. The rock unit~~s~~ of ~~high~~ unknown paleontological sensitivity (see Table 3.6-6) along Transmission Alternative Route C ~~are~~ is Quaternary alluvium (Qa/Qal) which is within a mile of the Quaternary lake/playa deposits (Ql/Qp~~) and Quaternary alluvium (Qa/Qal~~). Another underlying rock unit present along Alternative Route C is ~~composed of Paleozoic and Mesozoic sedimentary rocks (~~the Goodspring Dolomite (DЄgPzMzs), which is of low paleontological sensitivity. As part of construction of the proposed project, the applicant would implement APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, impacts would be less than significant with mitigation.

3.6.3.10 Transmission Alternative Route D and Subalternative E

With the exception of crossing a portion of Paleozoic- to Mesozoic bedrock at the southern tip of the Spring Mountains, Transmission Line Alternative Route D and Subalternative E are both similar to the proposed Transmission Line Alternative Route C and the proposed project route. They both are located in similar geology, soils, and mineralogical materials. The alternative routes are also similar in topography. The direct impacts and mitigation associated with these alternative and subalternative routes are similar to those in Alternative Route C.

3.6.3.11 Telecommunication Alternative (Golf Course)

The Golf Course Telecommunication Alternative is similar to the proposed route, except it does not cross the SFS Mesquite segment. This route extends along an alluvial apron (fan) from the Clark Mountains near Mountain Pass, and is parallel to the I-15 ROW. The Golf Course Telecommunication Alternative is located in similar geology, soils, and mineralogical materials. Negligible, localized, short-term impacts related to this alternative would include those occurring to the project from seismic ground shaking and seismic-related ground failure. With the implementation of APMs GEO-1 and GEO-2, those impacts would be less than significant without mitigation. The project would result in a minor, localized, long-term impact on soils due to erosion. With the implementation of MM GEO-3, this impact would be less than significant with mitigation. A minor, extensive, long-term impact on the project would be associated with unstable geologic units (subsidence). With the implementation of MMs GEO-1 and GEO-2, this impact would be less than significant with mitigation. A negligible, localized, long-term impact on the project would be associated with expansive soil. With the implementation of MM GEO-4, this impact would be less than significant with mitigation. The project would result in a negligible, area-wide, long-term impact on non-metallic mineral resources. However, since no specific locations for valuable mineral resources have been identified within the project area, there would be no loss of availability of a known mineral resource as a result of the proposed project. This impact would be less than significant without mitigation.

Construction of the Golf Course Telecommunication Alternative could cause direct impacts to buried paleontological resources due to ground-disturbing activities associated with positioning the line underground along Nipton Road. Potential direct impacts to paleontological resources during construction of the Golf Course Telecommunication Alternative would be adverse, negligible, localized, and short term. Preconstruction ground-disturbing activities (augering and trenching) as part of geotechnical investigations along the route of the Golf Course Telecommunication Alternative could impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. During later tower construction, ground-disturbing activities such as augering and trenching for support footings and grading for tower pads, service roads, and staging areas could impact paleontological resources in areas where underlying formations have ~~high~~unknown and low paleontological sensitivity. The rock units of ~~high~~unknown paleontological sensitivity (see Table 3.6-6) along the proposed Golf Course Telecommunication Alternative are Quaternary ~~Tertiary older alluvium (QT0a), Quaternary non-marine (Qc/Qoa), Quaternary~~ alluvium (Qa/Qal) ~~, and~~ within a mile of the Quaternary lake/playa deposits (Ql/Qp). Quaternary Tertiary Older Alluvium (QT0a), Quaternary non-marine (Qc/Qoa) and Quaternary alluvium (Qa/Qal) are of low sensitivity. Another underlying rock unit present along the Golf

Course Telecommunication Alternative is Ancient intrusive and metamorphic rocks (Xm), which are of very low paleontological sensitivity. As part of construction of the proposed project, the applicant would implement APMs PALEO-1 through PALEO-8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, impacts would be less than significant with mitigation.

3.6.3.12 Telecommunication Alternative (Mountain Pass)

The Mountain Pass Telecommunication Alternative is located in similar geology, soils, and mineralogical materials as Transmission Alternative Routes C and D and Subalternative E in the lower elevations, but also includes earlier Precambrian metamorphic bedrock of the Clark Mountains. The topography ranges from relatively flat low-lying valley bottoms and playa to moderately steep hill slopes of the Clark Mountains in the area of Mountain Pass substation.

Several direct impacts are associated with this alternative route. Negligible, localized, short-term impacts include those associated with seismic ground shaking and seismic-related ground failure. With the implementation of APMs GEO-1 and GEO-2, the impacts would be less than significant without mitigation. Minor, localized, long-term impacts of the project could result from both landslides and erosion. With the implementation of MMs GEO-2 and GEO-3 these impacts would be less than significant with mitigation. A minor, extensive, long-term impact to project structures could result from unstable geologic units (subsidence). With the implementation of MMs GEO-1 and GEO-2, this impact would be less than significant with mitigation. A negligible, localized, long-term impact to people and structures could result from building in expansive soil. With the implementation of MM GEO-4, this impact would be less than significant with mitigation. The project could result in negligible, area-wide, long-term impact to the availability of currently identified non-metallic mineral resources. However, since no specific locations for valuable mineral resources have been identified within the project area, there would be no loss of availability of a known mineral resource as a result of the proposed project. This impact would be less than significant without mitigation.

A portion of the Mountain Pass Telecommunication Alternative would go through the Molycorp Mine. Negligible to minor, short-term, adverse impacts from construction, operation, and maintenance of the project on mining operations are anticipated. Contaminated soils from the mine could be encountered during project construction. If that were to happen, the project could result in adverse impacts to water quality in local streams and spreading of contamination. As part of APM GEO-1, the applicant would identify contaminated soils along this alternative. Careful planning of soil segregation and treatment along the Mountain Pass Telecommunication Alternative route would minimize these impacts.

Construction of the Mountain Pass Telecommunication Alternative could cause direct impacts to buried paleontological resources due to ground-disturbing activities. Potential direct impacts to paleontological resources during construction of the Mountain Pass Telecommunication Alternative would be adverse, negligible, localized, and short term. Preconstruction ground-disturbing activities (augering and trenching) as part of geotechnical investigations along the route of the Mountain Pass Telecommunication Alternative could impact buried paleontological resources in underlying sedimentary formations of high paleontological sensitivity. During later tower construction, ground-disturbing activities such as augering and trenching for support footings and grading for tower pads, service roads, and staging areas could impact paleontological resources in areas where underlying formations have ~~high~~unknown to low paleontological sensitivity. The rock units of ~~high~~low paleontological sensitivity (see Table 3.6-6) along the proposed Mountain Pass Telecommunication Alternative are Quaternary Tertiary older alluvium (Qtoa), Quaternary non-marine (Qc/Qoa), and Quaternary alluvium (Qa/Qal). Another underlying rock unit present along the Mountain Pass Telecommunication Alternative is undivided Earlier Precambrian intrusive and metamorphic rocks (epC), which are of very low paleontological sensitivity. As part of construction of the proposed project, the applicant would implement APMs PALEO 1 through PALEO 8. These measures (provision of a project paleontologist to oversee potential impacts; pre-construction surveys; construction worker awareness programs; construction monitoring; and recovery, testing, and curation of any significant paleontological findings) would prevent significant impacts. Therefore, impacts would be less than significant with mitigation.

3.6.4 Mitigation Measures

MM GEO-1: Monitor and Mitigate Damage to Tower Structures. SCE will contact the California Department of Water Resources and the Nevada Division of Water Resources on an annual basis to determine if groundwater withdrawals pose a potential for threatening to ~~are threatening to~~ cause ground subsidence within the project area. If physical evidence proves groundwater withdrawals are threatening tower locations, ~~If subsidence threatens tower locations,~~ SCE will develop a plan, following their operations and maintenance policies, to mitigate potential damage to tower structures using standard foundation remediation techniques available.

MM GEO-2: Geotechnical Engineering Study. The applicant will prepare a geotechnical engineering study prior to the final project design to identify site-specific geological conditions and potential geologic hazards. The data collected from the study will be used to guide sound engineering practices and to mitigate potential geologic hazards.

MM GEO-3: Preparation and Implementation of SWPPP. The applicant will prepare a SWPPP for review and approval by the Lahontan Regional Water Quality Control Board (Region 6) and the Clark County Stormwater Quality Management Committee that addresses construction and post-construction project-related ground disturbances and associated erosion. The plan will provide the necessary engineering controls and procedures to minimize impact to the ground surface caused by construction, operation, and maintenance activities. A copy of the approved plan will also be submitted to the CPUC.

MM GEO-4: Expansive Soils Mitigation. The applicant will prepare a geotechnical study of the areas of expansive soil(s) identified in APM GEO-1 to develop appropriate design and mitigation measures prior to construction.

3.6.5 Whole of the Action / Cumulative Action

~~Below is a brief summary of information related to geology, mineral, and paleontological resources in the ISEGS FSA/DEIS prepared by the CEC and the BLM. This section focuses on differences in the ISEGS setting and methodology compared with the setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the CEC for ISEGS.~~

Information on geology, mineral, and paleontological resources related to the ISEGS project is summarized below. The setting for the ISEGS project is described, followed by methodologies used and summaries of the impact conclusions presented in the CEC's FSA, Addendum, and Final Decision and the BLM's Final EIS. Required mitigation measures and conditions of certification are listed.

3.6.5.1 ISEGS Setting

The ISEGS project would be constructed in a moderately active geological area on the west side of Ivanpah Valley. Existing conditions ~~for~~at the ~~ISEGS project~~ site are ~~primarily~~in most respects consistent with ~~the EITP as~~those described for the EITP in Section 3.6.1~~. Any discrepancies between the ISEGS project site and the EITP site~~ (above); differences are described below.

~~**Project Site Geology**~~

~~The three ISEGS power plant sections (from south to north, Ivanpah 1, 2, and 3) would be located on a broad alluvial slope of coalescing alluvial fans along the eastern flank of the Clark Mountain Range. These alluvial fans may be relatively thin near the margins where carbonate and metamorphic rock are exposed, and there is only limited data on its thickness away from these margins.~~

The three ISEGS sections (Ivanpah 1, 2, and 3, from south to north) would occupy a gently sloping area with coalescing alluvial fans on the eastern flank of the Clark Mountains.

~~Geologic Hazards~~

~~Fault Rupture~~

~~No active faults have been identified crossing the boundary of new construction on the proposed ISEGS site or in the vicinity of the proposed gas pipeline. The potential for surface rupture on a fault at any of the three power plant sites (Ivanpah 1, 2, and 3) is very low since no faults are known to have ruptured the ground surface of the proposed ISEGS location.~~

~~Groundshaking~~

~~The intensity of seismic shaking expected in the area of the Ivanpah Substation site is consistent with the EITP site. Due to the uncertainty in the uppermost soil profile, a design-level geotechnical investigation is proposed as part of the Condition of Certification (GEO-1) to further evaluate this potential hazard and provide appropriate seismic design parameters.~~

~~Liquefaction~~

~~The potential for liquefaction in the area of the Ivanpah Substation is consistent with the EITP site and is low within the ISEGS project area based on a soil boring in one of the power plant sites (Ivanpah 2). Due to the uncertainty of the liquefaction potential in the other two power plant sites (Ivanpah 1 and 3), a geotechnical investigation is proposed as part of the Condition of Certification (GEO-1) to further evaluate this potential hazard.~~

~~Landslides~~

~~The landslide potential at the ISEGS site is negligible since ISEGS is located on a broad, gently east-sloping alluvial fan.~~

~~Expansive Soils~~

~~The potential for expansive soils within the ISEGS project area is uncertain, although the soil encountered in the boring in power plant site Ivanpah 2 were not expansive. There are no data for the other two (Ivanpah 1 and 3) power plant areas. Due to the lack of expansion testing in power plant site Ivanpah 2, and the uncertainty of the expansion potential in the other two power plant sites (Ivanpah 1 and 3), a geotechnical investigation is proposed as part of the Condition of Certification (GEO-1) to further evaluate this potential hazard.~~

~~Collapsible Soils~~

~~The potential for collapsible soils within the ISEGS project area is uncertain, although the soils encountered in the boring in power plant site Ivanpah 2 were not susceptible to either dynamic compaction or hydrocompaction, due to their medium dense to very dense granular composition. There are no soil composition data for the other two (Ivanpah 1 and 3) power plant areas; a geotechnical investigation is proposed as part of the Condition of Certification (GEO-1) to further evaluate this potential hazard.~~

~~Mineral Resources~~

~~There are a variety of active mining operations in the general area near the ISEGS project location, but no active operations occur within the proposed ISEGS project boundaries. In addition, the general area is considered to have low potential for leasable minerals such as oil and gas. The applicant may need to move sand and gravel off site, or between different units of the facility, which would require compliance with BLM regulations (40 CFR Part 3600). Other adjacent claims along the western boundary, Limestone Hill, have two active locatable minerals claims with underground workings; the current extent is unknown, and there is no indication that these would become active economic commercial operations. The ISEGS project area is currently not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals.~~

~~Paleontological Resources~~

~~The ISEGS project area is underlain by two surficial geologic units (Quaternary alluvium and Quaternary older alluvium). These are alluvial fan deposits developed on the base of the Clark Mountain Range. Because of the coarseness and youth of Quaternary alluvium and Quaternary older alluvium, the ISEGS FSA/DEIS rates paleontological sensitivity of this rock unit as low. Because fossil resources were found in Quaternary older alluvium in adjacent areas, the EITP DEIS rated paleontological sensitivity of this rock unit high at the Ivanpah Substation. The ISEGS FSA/DEIS notes that there would be the potential to encounter geologic units with a higher paleontological sensitivity below the alluvium during construction and site grading. The Staff rates these units (Quaternary lacustrine sediments and Paleozoic carbonate rock) as having high paleontological sensitivity. The pre-Cambrian to Cambrian metamorphic rocks have been rated as having negligible paleontological sensitivity. No paleontological resources were identified by the paleontological record searches conducted for the ISEGS project area.~~

Geologic hazards were investigated for the ISEGS project. Several active and potentially active faults are present within 100 miles of the ISEGS project area, but no active faults are known to cross the boundary of proposed new ISEGS construction or to exist in the vicinity of the proposed gas pipeline, and the potential for surface rupture on a fault at the site is low. Ground acceleration related to the Stateline Fault 4.5 miles northeast of the site could be fairly high. The landslide potential in the ISEGS project area is negligible. The strong ground shaking potential in the ISEGS project area is expected to be similar to expectations for the EITP site. The potential for liquefaction at Ivanpah 2 is low, based on two exploratory soil borings there. Soil encountered in the borings at Ivanpah 2 was not expansive, and was not susceptible to either dynamic compaction or hydrocompaction. Subsidence may be caused by petroleum or groundwater withdrawal and can result in collapse of overlying soils; it has been observed along the northern edge of Ivanpah Dry Lake and elsewhere in the region, but coarse-grained soils such as those from the Ivanpah 2 boring are not highly sensitive to the surcharge loading that can lead to subsidence. The CEC's conditions of certification (below) propose a geotechnical investigation (GEO-1) to address uncertainty of the potential for liquefaction, expansive soils, collapsible soils, or subsidence at Ivanpah 1 and 3.

The ISEGS project area is currently not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals. Two active locatable minerals claims exist along the ISEGS project's western boundary (on Limestone Hill) and are explored sporadically, but commercial production is not apparent. No active mining operations occur within the ISEGS project boundaries. The general area does contain active mines, but has low potential for leasable minerals such as oil and gas and no active oil or gas operations exist in the immediate project vicinity. Sand and gravel (salable resources) are present at the site and elsewhere in the region.

No paleontological resources have been documented on the ISEGS plant sites or proposed laydown area. The BLM and CEC rated paleontological sensitivity of surficial Quaternary alluvium and Quaternary older alluvium rock units at the site as low. However, the EITP DEIS rated paleontological sensitivity of Quaternary older alluvium as high at the Ivanpah Substation, because fossil resources were found in this rock unit in adjacent areas. Quaternary lacustrine sediments and Paleozoic carbonate rock of high paleontological sensitivity could exist below the alluvium. Pre-Cambrian to Cambrian metamorphic rocks northeast of Ivanpah 2 were rated as having negligible paleontological sensitivity.

Applicable Laws, Regulations, and Standards

~~Due to the variation in~~ Because ISEGS and EITP project components and ~~location between EITP and ISEGS,~~ locations are different, some different laws, regulations, and standards would apply ~~to ISEGS than those listed in Section 3.6.2~~. Since ISEGS would be developed entirely within California on BLM land, the Nevada regulations associated with the EITP would not apply ~~Table 3.6.7 identifies the laws~~.

Laws, regulations, and standards ~~that are~~ applicable to the ISEGS project but not the EITP~~.~~ are:

- Federal
  - Natural Gas Pipeline Safety Act of 1968

- State
  - CEQA, PRC Sections 15000 et seq., Appendix G (mandates that public and private entities identify the potential impacts on the environment during proposed activities)
  - CPUC General Order 112-E (establishes requirements for design, construction, and other parameters related to safety and public welfare, and provides for maintenance of adequate gas utility service)
- Local
  - San Bernardino County Ordinance Code, Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal (regulates the new septic tank and leach field)
  - San Bernardino County Ordinance Code, Title 6, Division 3, Chapter 3, Uniform Plumbing Code (regulates the new septic tank and leach field)

~~Table 3.6-7 Laws, Regulations, and Standards Applicable to the ISEGS Project~~

~~Law, Regulation, or Standard~~	~~Description~~	~~Project Component~~
~~Federal~~		
~~The Natural Gas Pipeline Safety Act of 1968~~	~~The Natural Gas Pipeline Safety Act of 1968 as amended through March 2006 (Title 49 Section VIII USC Chapter 601) specifies, among others, the minimum safety standards for designing, installing, constructing, initially inspecting, and initially testing a new natural gas pipeline facility. These standards include the characteristics of the material used in constructing the facility, design factors for specific locations, and the public safety factors, particularly its ability to prevent and contain a natural gas spill. The design standards for specific locations reflect site-specific geological, topographical, seismic, and soils conditions.~~	~~Natural gas pipeline~~
~~State~~		
~~CEQA, PRC Sections 15000 et seq., Appendix G~~	~~CEQA mandates that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and defines significant impacts.~~	~~Geological, soil, mineral, and paleontological resources~~
~~CPUC General Order 112-E~~	~~CPUC General Order 112-E establishes minimum requirements for the design, construction, quality of materials, locations, testing, operations and maintenance of facilities to safeguard life or limb, health, property, and public welfare and to provide that adequate service will be maintained by gas utilities operating under the jurisdiction of the CPUC.~~	~~Natural gas pipeline~~
~~Local~~		
~~San Bernardino County Ordinance Code, Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal~~	~~This ordinance requires the following compliance for all liquid waste disposal systems: (1) compliance with applicable portions of the Uniform Plumbing Code and the San Bernardino County Department of Environmental Health (DEHS) standards; (2) approval by the DEHS and building authority with jurisdiction over the system; or (3) for alternative systems, approval by the DEHS, the appropriate building official of this jurisdiction, and the appropriate California Regional Water Quality Control Board.~~	~~New septic tank and leach field~~
~~San Bernardino County Ordinance Code, Title 6, Division 3, Chapter 3, Uniform Plumbing Code~~	~~This ordinance describes the installation and inspection requirements for locating disposal/leach fields and seepage pits.~~	~~New septic tank and leach field~~

3.6.5.2 ISEGS Methodology

~~In the ISEGS FSA/DEIS, BLM and CEC staff (Staff) reported on existing conditions and assessed impacts to geology, mineral, and paleontological resources in the same section. In addition, staff evaluated the potential of the ISEGS project to restrict or remove from access potential sources of salable mineral resources. Staff considered compliance with the laws, ordinances, regulations, and standards associated with the project components and location. Staff also considered whether there would be a significant impact under CEQA using the impact criteria described in Section 3.6.3.~~

CEC FSA Methodology

The CEC followed the 2006 CEQA guidelines to analyze potential impacts to the ISEGS project and resulting from the project. Guidelines specific to this section were those addressing whether the project would:

- Destroy a unique paleontological resource or site or a unique geological feature
- Expose people or structures to geologic hazards
- Affect mineral resources

The California Building Standards Code and the 2007 CBC guidelines related to geotechnical investigations were followed to evaluate the potential of each hazard to impact design or construction of the facility. Resource maps and site-specific information from the applicant were reviewed, with a focus on effects of groundwater extraction and grading; proposed operating procedures were also reviewed. The Potential Fossil Yield Classification (PYFC) system was used to assess impacts to paleontological resources.

BLM FEIS Methodology

The FEIS followed the CEQA guidelines that were used for the FSA analysis. Like the FSA, the FEIS used guidance from California building codes and consulted resource maps, reports, and related data as well as information provided by the applicant.

3.6.5.3 ISEGS Impacts

~~The Staff determined that construction, operation, and decommissioning of the ISEGS project could impact geologic, mineralogical, or paleontological resources. Where impacts were identified, the Staff proposed mitigation measures (Conditions of Certification) to reduce impacts to less than significant levels.~~

~~The CEC and BLM have published the following impacts related to geology, soils, minerals, and paleontological resources for the ISGES project:~~

The CEC FSA states that “the potential for significant adverse impacts to the project from geologic hazards, and to potential geologic, mineralogical, and paleontological resources from the proposed project, is low.” Similarly, the BLM FEIS indicates that, with mitigation, geologic conditions would not present hazards to the ISEGS project, and the project would not impact development of geologic or mineral resources.

CEC Impact Conclusions

The FSA states that the ISEGS project could be designed and built so that public safety and environmental quality would be protected. The CEC determined that impacts related to potential geologic hazards could be mitigated to a less than significant level through facility design based on the geotechnical report required by the 2007 CBC and Conditions of Certification GEO-1, GEN-1, GEN-5, and CIVIL-1. The FSA states that the ISEGS project “should not have significant NEPA or CEQA impact on” availability of sand and gravel and that impacts to any paleontological resources encountered could be mitigated by Conditions of Certification PAL-1 through PAL-7.

The FSA Addendum indicates that for geology, paleontology, and minerals, the project (1) complies with LORS, (2) fully mitigates direct and indirect impacts, and (3) fully mitigates cumulative impacts. The Final Decision states that "the parties did not dispute any matters related to this topic [these resources]."

BLM Impact Conclusions

Construction Impacts

~~Geologic hazards have been identified associated with the ISEGS project area and include strong ground shaking, liquefaction, settlement due to compressible soils, subsidence associated with shrinkage of clay soils, hydrocompaction (or dynamic compaction), and the presence of expansive clays.~~

~~The ISEGS project would directly remove approximately 4,072.5 acres from potential use for sand and gravel production under BLM's salable mineral program. The ISEGS FSA/DEIS states that this removal is not expected to have any significant impact since it represents a small fraction of the total sand and gravel resource available within the valley. In addition, the applicant may need or desire to move sand and gravel either off site or between the different units of the facility. Should this occur, the applicant would be required to comply with BLM regulations in 43 CFR Part 3600, which regulates the production and use of sand and gravel from public lands. Use of sand and gravel or other mineral materials within the boundaries of an authorized ROW is permitted; however, removal of these materials from an authorized ROW would require payment to the U.S. of the fair market value of those materials. The ISEGS project would not have any direct or indirect impact on the production of locatable or leasable minerals outside of the ISEGS project boundaries. The only potential conflict would occur if the claimant or another person located a new claim, for locatable minerals underneath the proposed project, within the project boundaries. This could occur, as the proposed project location has not been withdrawn from mineral entry. The potential for this scenario is expected to be low. If it did occur, conflicts between the surface use of the land for solar energy production and access to the subsurface minerals would be addressed in accordance with appropriate regulations. Therefore, the ISEGS FSA/DEIS states that the ISEGS project would not impact any current or reasonably foreseeable development of mineral resources.~~

~~The ISEGS FSA/DEIS states that paleontological resources are known to exist in the region but that no paleontological resources have been documented on the ISEGS site. If they were encountered, potential impacts to them from construction activities would be minimized through worker training and monitoring by qualified paleontologists. The ISEGS project would include grading, foundation excavation, utility trenching, and possibly drilled shafts. The ISEGS FSA/DEIS considers the probability of encountering paleontological resources to be generally high on portions of the site, particularly the west side of Ivanpah 3, based on the soils profile, SVP assessment criteria, and the near surface occurrence of the sensitive geologic units. The potential for encountering fossils hosted in Quaternary lake bed sediments will increase with the depth of cut. Excavations for ancillary facilities and new pipelines and onsite excavations deeper than 5 feet may have a higher probability of encountering potentially high sensitivity materials, although sensitive materials could occur nearer the surface.~~

~~Based on the literature and archives search, field surveys, and compliance documentation for the ISEGS, the applicant has proposed monitoring and mitigation measures (Conditions of Certification) to be followed during the construction of the ISEGS project. The ISEGS FSA/DEIS states that the facility can be designed and constructed to minimize the effect of geologic hazards at the site during project design life and that impacts to vertebrate fossils encountered during construction of the power plant and associated linear projects would be mitigated to a level of insignificance.~~

The FEIS states that the required geotechnical investigation and GEO-1 should mitigate potential geologic hazards through design considerations. Locatable or leasable minerals outside project boundaries would not be impacted. Although project land would be unavailable for sand and gravel production, no adverse impact should result because sand and gravel are widely available in the region. The ISEGS project would not impact any current or reasonably foreseeable development of mineral resources.

The FEIS concluded that a high potential exists to encounter sensitive paleontological resources, especially during excavation in the western portion of Ivanpah 3, but this impact could be mitigated by worker training and monitoring (PAL-1 through PAL-7). The FEIS indicated a potential net gain to paleontology from the project because fossils might be discovered that otherwise would not have been. Paleontologically sensitive sediments are unlikely to exist at depths that would be affected by grading and trenching. Removal of 433 acres for the Mitigated Ivanpah 3 Alternative would eliminate the most intense disturbance and thus reduce disturbance impact by more than the 12.5% acreage reduction.

Operational Impacts

~~The ISEGS FSA/DEIS states that operation of the ISEGS project facilities would not have any adverse impact on geologic, mineralogical, or paleontological resources. The ISEGS FSA/DEIS also states that the potential geologic hazards, including strong ground shaking; liquefaction; settlement due to compressible soils, subsidence associated with shrinkage of clay soils, hydrocompaction, or dynamic compaction; and the presence of expansive clay soils could be effectively mitigated through facility design such that these potential hazards should not affect operation of the facility.~~

Geologic conditions including seismicity, subsidence, and landslides could impact ISEGS operations, but impacts would be mitigated through compliance with building codes, and low occupancy would result in low risk to human life and safety. The ISEGS project would not impact the two active locatable minerals claims on Limestone Hill. As for construction, sand and gravel availability in the region should not be affected by operations. Overall, the FEIS stated that ISEGS plant operation "should not have any adverse impact on geologic, mineralogical, or paleontological resources considering GEO-1 and CEC's GEN-1, GEN-5, and CIVIL-1."

Decommissioning Impacts

~~The ISEGS project would be decommissioned at the end of its 50-year life by removing all facilities to 3 feet below grade, restoring original contours, and revegetating the site. The ISEGS FSA/DEIS states that this removal should not negatively affect geologic, mineralogical, or paleontological resources since the majority of the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the project. Facility closure would make land occupied by the proposed project once again available for potential future development of geologic or mineralogical resources within the former project borders.~~

The FEIS states that adverse impacts from decommissioning would not occur because ground disturbance would have already occurred during construction.

3.6.5.4 ISEGS Mitigation Measures / Conditions of Certification

~~The ISEGS FSA/DEIS recommends that the following Conditions of Certification be required by the CEC and the BLM to lessen impacts to related to geology, paleontology, and mineral resources if the project is approved. This document presents a summary for the ISEGS Conditions of Certification. For the complete language of the Conditions of Certification, refer to the ISEGS FSA/DEIS. Since the ISEGS document presented geology, mineral, and paleontological resources in one section, the Conditions of Certification listed below apply to these resource areas. The ISEGS documents presented soil and water resources in one chapter. The applicable Conditions of Certification for soil resources are presented in Section 3.8, "Hydrology and Water Quality."~~

CEC Conditions of Certification

CEC Conditions of Certification GEO-1 and PAL-1 through PAL-7 (designed to mitigate potential impacts to paleontological resource to less than significant levels) are summarized as BLM Mitigation Measures in the BLM section below. Conditions of Certification GEN-1, GEN-5, and CIVIL-1 (provided in full in the Facility Design section of the FSA and also in Appendix C of the FEIS), proposed to mitigate geologic hazard impacts to a less than significant level, are summarized below.

GEN-1 requires the project owner to design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC). The project owner must ensure that all contracts clearly specify that all work performed and materials supplied must comply with the applicable codes.

GEN-5 requires the project owner to assign California-registered engineers from specific disciplines to the project, and stipulates their responsibilities and the notification/approval requirements if an engineer is replaced.

CIVIL-1 requires the project owner to submit to the CBO for review and approval (1) a drainage design and a grading plan, (2) an erosion and sedimentation control plan, (3) related calculations and specifications, and (4) soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

BLM Mitigation Measures

~~**GEO-1** requires the ISEGS project applicant to prepare a Soils Engineering Report required that meets Section 1802A of the 2007 CBC to specifically include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of the potential for liquefaction; settlement due to compressible soils, subsidence associated with shrinkage of clay soils, hydrocompaction, or dynamic compaction; and the presence of expansive clay soils. The report would also include recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present.~~

~~**PAL-1** requires the project applicant to provide BLM's Authorized Officer and the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. Any changes to the PRS will be approved by the BLM's Authorized Officer and CPM.~~

~~**PAL-2** requires the project applicant to provide to the PRS, BLM's Authorized Officer, and the CPM, for approval, maps and drawings showing the footprint of the power plants, construction lay down areas, and all related facilities identifying all areas of the project where ground disturbance is anticipated. Any changes must be approved by the PRS, BLM's Authorized Officer and CPM. A letter identifying the proposed schedule of each project power plant shall be provided to the PRS, BLM's Authorized Officer and CPM. At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s)~~

~~**PAL-3** requires, if after review of the plans provided pursuant to **PAL-2**, the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted, the project applicant to ensure that the PRS prepares, and the project owner submits to BLM's Authorized Officer and the CPM for review and approval, a PRMMP to identify general and specific measures to minimize potential impacts to paleontological resources. Approval of the PRMMP by BLM's Authorized Officer and the CPM shall occur prior to any ground disturbance.~~

~~**PAL-4** requires, if after review of the plans provided pursuant to **PAL-2**, the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted then, prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project applicant and the PRS shall prepare and conduct weekly BLM Authorized Officer- and CPM-approved training for the following workers: project managers, construction supervisors, foremen and general workers involved with or who operate ground-disturbing equipment or tools.~~

~~**PAL-5** requires the project applicant to ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of BLM's Authorized Officer and the CPM.~~

~~**PAL-6** requires the project applicant, through the designated PRS, to ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of~~

~~fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all paleontological resource materials encountered and collected during project construction.~~

~~**PAL-7** requires the project applicant to ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information, and submit it to the CPM for review and approval.~~

GEO-1 requires the ISEGS project applicant to prepare a Soils Engineering Report that meets Section 1802A of the 2007 CBC. The report must include laboratory test data, geotechnical engineering analyses, and a thorough discussion of the potential for geological hazards, as well as recommendations for ground improvement and/or foundation systems necessary to mitigate the hazards, if present.

PAL-1 requires the project applicant to provide BLM's Authorized Officer and the CEC's Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. Any changes to the PRS require BLM and CEC approval.

PAL-2 requires the applicant to provide maps and drawings showing ground disturbance and the footprint of construction areas to the PRS, BLM's Authorized Officer, and the CPM for approval. These officials must be provided with proposed schedules and notified of any schedule changes. The project owner must ensure that the PRS or PRM consults weekly (until ground disturbance is completed) with the project superintendent or construction field manager to confirm area(s) to be worked the following week.

PAL-3 requires preparation and submission of a paleontological resources monitoring and mitigation plan (PRMMP) to minimize impacts if the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted. The PRMMP must be approved before ground disturbance commences and consulted when on-site changes are proposed.

PAL-4 specifies required weekly training for relevant workers and prohibits excavation before training, if the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted.

PAL-5 requires monitoring consistent with the PRMMP for all construction-related ground disturbance where potential fossil-bearing materials have been identified. Proposed changes in monitoring levels require the project owner to notify and seek the concurrence of BLM's Authorized Officer and the CPM. The project owner must ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. A summary of the monitoring must be provided in monthly reports.

PAL-6 requires the project owner, through the designated PRS, to ensure that all components of the PRMMP are adequately performed.

PAL-7 requires that a Paleontological Resources Report (PRR) analyzing the collected fossil materials and related information be submitted to the CPM for review and approval after completion of ground-disturbing activities.

3.6.6 Combined Impact of EITP and ISEGS

The CEQA and NEPA EITP and ISEGS impact analyses related to geology, soils, minerals, and paleontology were based on similar significance criteria that evaluated the extent to which the proposed projects would impact these resources in the project area and the potential impact on project components and public safety related to geologic hazards.

For EITP, the CPUC/BLM concluded that the risk related to geologic hazards would be less than significant with the incorporation of APM GEO-1, APM GEO-2, MM GEO-1, MM GEO-3, and MM GEO-4. The CEC concluded that impacts related to potential geologic hazards could be mitigated to less than significant levels through facility design based on the geotechnical report required by the 2007 CBC and Conditions of Certification GEO-1, GEN-1, GEN-5, and CIVIL-1. For ISEGS, the BLM similarly concluded that the required geotechnical investigation and GEO-1 should mitigate potential geologic hazards through design considerations.

Soil erosion for both projects would be mitigated by best management practices outlined in the each project's SWPPP.

Locatable or leasable minerals were not identified on either project site. The CPUC/BLM concluded that EITP would have less than significant impacts with the incorporation of the findings in the geotechnical report in APM GEO-1. The CEC concluded that ISEGS should not have a significant NEPA or CEQA impact on the availability of sand and gravel resources. The BLM concluded that ISEGS would have no adverse impact on the availability of sand and gravel resources because they are abundant in the region. Additionally, the BLM's FEIS concludes that the ISEGS project would not impact any current or reasonably foreseeable development of mineral resources.

The CPUC/BLM concluded that EITP construction would have less than significant impacts on paleontological resources with the incorporation of APMs PALEO 1 through 8, including preconstruction surveys, worker training, and construction monitoring. The CEC concluded that potential impacts to paleontological resources could be successfully mitigated by Conditions of Certification PAL-1 through PAL-7. The BLM found that there was a high potential to encounter sensitive paleontological resources, especially during excavation in the western portion of Ivanpah 3, but this impact could be mitigated to less than significant levels by worker training and monitoring, as outlined in mitigation measures PAL-1 through PAL-7. The BLM noted that there is a potential for beneficial impacts to paleontology if fossils were located that would have been undiscovered without project development.

With mitigation, impacts from the two projects together would be less than significant on geology, soils, mineral resources, and paleontological resources. Additionally, the two projects would have less than significant impacts due to geologic hazards. See Section 5.3.8.6 for a discussion of cumulative impacts.