Appendix E

Primm Project Technical Description

3.0 PROJECT DESCRIPTION

First Solar Inc. (First Solar) applied to the California Independent System Operator (CAISO) for interconnection of a new 250 MW solar generation project currently referred to as the Silver State Solar South Project ("SSSP"). First Solar requested and paid for Interconnection Studies in accordance with the CAISO Large Generation Interconnect Procedures (LGIP) Tariff. The CAISO assigned Queue Positions to the SSSP are No. 467 for 230 MW and No. 502 for 20 MW. All applicable interconnection studies have been completed for the SSSP. A Generator Interconnection Agreement (GIA) effective October 19, 2011 has been executed which would enable the project to interconnect to the CAISO grid with Full Deliverability Status.

Southern California Edison (SCE) proposes to construct the new Primm Substation and associated facilities to interconnect the 250 MW SSSP to SCE's Eldorado-Ivanpah No. 2 220 kilovolt (kV) Transmission Line. This project description is prepared for the Bureau of Land Management (BLM) for use in BLM's Environmental Impact Statement (EIS). The major components of the proposed Primm Project are summarized below:

- *Primm Substation*: Construction of a new 220 kV substation (no power transformation). Primm Substation would be unstaffed, automated, and contain a switchrack with three positions. The substation could be expanded up to eight positions at the final build out.

- Install and/or reset Special Protection Scheme (SPS) relays in the Mechanical and Electrical Equipment Room (MEER) at Ivanpah Substation.

- Install and/or reset SPS relays in the existing 220 kV relay room at Eldorado Substation as well as reset protection line relays at outlying substations as defined during detailed engineering.

- *Transmission Lines*: Loop the Eldorado-Ivanpah No. 2 220 kV Transmission Line into the new Primm Substation. The Eldorado-Ivanpah No. 1 220 kV line would be routed along with the Eldorado-Ivanpah No. 2 line on the same set of structures, but would not looped into Primm Substation. The Eldorado-Ivanpah No. 1 line would be jumper structures right outside the substation for future access. The Eldorado-Ivanpah No. 2 Line loop-in would require construction of approximately 1, 500 feet of new transmission line segments (comprised of two line segments of approximately 750 feet each) forming the new Eldorado-Primm 220 kV Transmission Line and Ivanpah-Primm 220 kV Transmission Line. The Eldorado-Ivanpah No. 1 220 kV Transmission Line would run adjacent to the Primm Substation facility using 1,200 feet of the same transmission line path. New access and spur roads would also be constructed. (Figure 3.1-A)

- *Generation Tie Line Connection*: Connect the one SSSP-built gen-tie into the SCE-owned Primm Substation. This work involves construction of at least one structure and SCE-owned span of conductor between the Primm Substation switchrack and the SCE property boundary line. Total number of structures and spans required to facilitate this scope will be finalized during detailed engineering.

- *Telecommunications Facilities*: Install fiber optic communication cables, conduits, underground structures, and other telecommunication facilities to provide diverse path routing of communications required for the SSSP interconnection, and to provide communications redundancy at the SSSP power block. Install the new Primm Microwave Communication Site. Facilities would include construction of a telecommunications room at Primm Substation. Work would also include installing communication paths between Primm Substation, Eldorado Substation, and Ivanpah Substation, as well as installation of Remote Terminal Units (RTU) at the SSSP power block.

- *Distribution Facilities*: Install distribution facilities including any necessary poles, down guys, anchors, conduits, underground structures, cables, transformers, and metering equipment to serve the Primm Microwave Communication Site, temporary construction power, and/or a source of Primm Substation station light and power.

This project description is based on planning level assumptions. Further details will be made available upon completion of preliminary and final engineering, incorporation of SCE standards, identification of field conditions, verification of materials and equipment availability, and compliance with applicable environmental and permitting requirements. As for construction work activities, SCE anticipates working typical construction schedules; however, the actual construction hours may vary.

3.1 Proposed Project Components

The components of the Proposed Project are described in more detail below:

3.1.1 Substation Description

Primm Substation would be a 220 kV substation with internal measurements of approximately 600’ x 310’. Primm Substation would be an unattended, automated, switchrack with three positions equipped and an ultimate build out of eight positions. The substation would be surrounded by a wall with four gates.

Primm Substation would provide the SSSP with the physical facility to interconnect to SCE’s 220 kV transmission system. This substation is a part of the SSSP as provided in the project description in the Supplemental Draft Environmental Impact Statement (SEIS). As further described below, the footprint of the substation is expected to be placed on an area of approximately 800 feet by 510 feet (which includes setbacks for generation tie lines). At this time, the extent of the SCE facilities would be approximately 28 to 30 acres including Primm Substation, transmission, distribution, and telecommunication facilities. To accommodate the proposed Primm Substation and to allow for access to the substation, 1) a 24 foot wide internal aggregate base road through SSSP property would be needed to access the proposed Primm Substation property, and 2) Temporary construction yards/staging areas, approximately 13 acres combined, necessary for substation, distribution, and telecommunication facilities to construct the Primm Substation.

3.1.2 Substation Design and Equipment

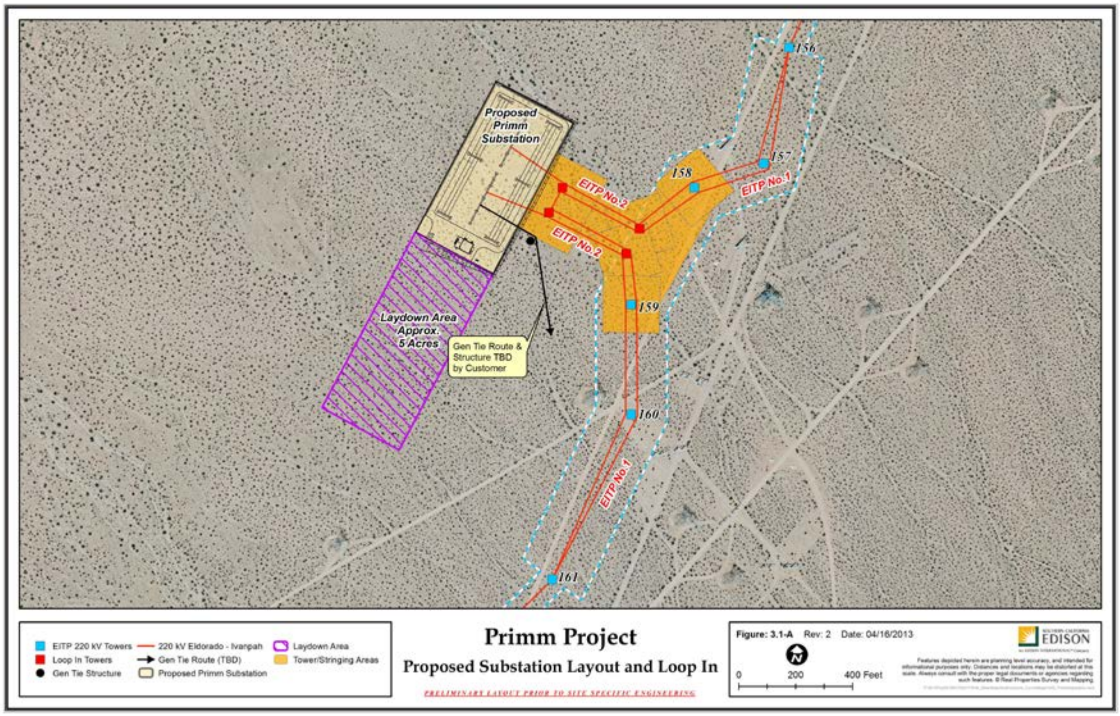
The substation components are described below. Figure 3.1-A, Proposed Substation Layout, shows the approximate dimensions of the substation parcel and the placement and orientation of the major components that would be included in the construction of the Primm Substation.

SCE would engineer, design, construct, and test the proposed Primm Substation. The substation would consist of a three double breaker position 220 kV switchrack (with ultimate build out to eight positions). Two positions would be utilized to loop the SCE Eldorado-Ivanpah No. 2 220 kV Transmission Line and a third position would be utilized to terminate the SSSP gen-tie. Primm Substation would be initially equipped with:

- Two (2) overhead 220 kV buses
- Six (6) 220 kV circuit breakers
- Twelve (12) 220 kV disconnect switches
- One (1) Mechanical Electrical Equipment Room (MEER)
- Station, Light and Power transformers and panels
- Station lighting
- Self-Contained Restroom
- Three (3) manual gates and one (1) motorized gate
- Station Security System
- Pre-fabricated concrete perimeter wall

SCE considers the California Building Code and the Institute of Electrical and Electronic Engineers (IEEE) 693, Recommended Practices for Seismic Design of substations when designing substation structures and equipment.

Figure 3.1-A: Proposed Project Substation Layout



3.1.2.1 220 kV Switchrack

The proposed 220 kV steel switchrack would be approximately 65’ x 240’ x 460’. The switchrack would consist of a maximum of three equipped positions with expansion up to eight positions total.

All three positions (two utilized to loop the SCE Eldorado – Ivanpah No. 2 220 kV Transmission Line and one utilized to terminate the SSSP gen-tie) would have two circuit breakers and four disconnect switches.

3.1.2.2 Substation Electrical Power

The new substation would have independent sources of 120/240 volt electrical power. The first source of power would be the connection to the 220 kV of the substation’s switchrack. A second source would be a nearby distribution line that would be connected to the substation site, or from a connection to the 220 kV of the substation’s switchrack.

3.1.2.3 Mechanical and Electrical Equipment Room

A MEER is a prefabricated structure that is typically made of steel. Control cable trenches would be installed to connect the MEER to the 220 kV switchracks. The MEER dimensions would be approximately 12’ x 60’ x 40’.

3.1.2.4 Self-Contained Restroom Facilities

The restroom facility and adjoining septic tank would be located within a chain link fenced enclosure in the near proximity to the substation driveway gate. A separate walk-in gate would allow a contracted service provider to access the restroom without entering the substation operating areas.

The restroom would consist of a manufactured prefabricated concrete structure measuring approximately 8’ x 10’ x 10’, placed on a 12-inch thick reinforced concrete foundation slab. The restroom enclosure would contain an Americans with Disabilities Act (ADA) compliant toilet area which would include a toilet and wall mounted sink and an equipment/service room. Due to the absence of a water supply a holding tank would be incorporated into the facility for the purpose of hand washing and flushing. Water would be resupplied by the outside service company on a regular basis.

Waste storage would be managed by the installation of a separate 5’ x 8’ subsurface reinforced concrete septic tank approximately 7 feet deep with approximately 12 inches of soil cover and would be immediately inside the walk-in gate. All external and internal surfaces of the tank would be sealed to prevent seepage through the walls. Two top surface access ports allow for servicing. The location would prevent any vehicle traffic from driving over the tank. Periodic maintenance of the tank would be conducted by the contracted service company and the frequency of service would be determined based on the frequency of use by substation operating personnel.

Exterior wall surface texturing of the facility would be either a “Barn-wood” simulation of rustic siding or a stucco appearance and would be determined with the manufacturer during the design and procurement phase of the facility. The roof texture options would include a cedar shake or tile simulation and be determined during the design and procurement phase. All exterior colors would be determined during the design and procurement phase and would match as close as possible the substation’s external concrete wall. Note: All colors would be coordinated with and approved by the BLM.

Exterior lighting would consist of a manually operated wall mounted dual lamp fixture located over the toilet area door. There would be no automatic lighting required, either infrared or by a timer. Trash would be collected in a standard steel wastebasket and periodically disposed of along with the normal substation trash.

This facility would use standard plumbing fixtures (toilet and sink) therefore no chemicals or filters are required. There would be no leaching lines installed either inside or outside the Primm Substation facility and property. Storage of expendable supplies, i.e. paper towels, toilet paper, soap would be in a cabinet located within the toilet area.

3.1.2.5 Substation Access

Access to the substation site for both construction and operation would be gained on an access road adjacent to the First Solar facilities from East Primm Boulevard. Sections of the new access roads would be aggregate base as identified in the SSSP facility application.

3.1.2.6 Substation Grading and Drainage

The development of the Primm Substation site would be dependent on the wide-ranging improvements of the entire SSSP. To that end a comprehensive site development plan including the Primm Substation would be required to ensure that aspects of the overall project area. It would provide the maximum efficiencies of design and the maximum protection of improvements. To accomplish this task, the preparation of the Primm Substation site would be included within the SSSP site development design, permitting and construction.

The raised graded substation pad would slope at a minimum of 1% and measure approximately 630’ x 330’ and would be constructed on a parcel of land under grant to SCE from the BLM. Up to four substation entry roads would also be included within the design. The grading would comprise of all surface preparation including the stripping and disposal from the site of vegetation and deleterious materials; the importing of soil to grade the site to meet SCE’s requirements; providing the improvements to protect the substation pad from up-slope surface water run-off and also to prevent down slope erosion or other damage due to uncontrolled water flow from the substation site. The site grading plan would be carried out in accordance with the agency approved plans and permits.

Within the enclosed substation there would be small concrete swales installed along the inside of the perimeter to convey surface run-off to designated openings where the water would be dispersed upon the exterior surface by means of rock rip-rap or similar systems. There would be no new ground disturbances associated with these improvements and the volume of concrete would be limited to approximately 20 cubic yards.

Rock rip-rap may be required at the two down-slope external corners of the substation pad to disperse any concentration of surface flow from around the substation sides. The rip-rap would create water energy dissipation fields to decrease the flow intensity and spread the run-off over a wider area thereby mitigating the impacts on down-slope properties. These improvements would be within areas previously disturbed during site grading.

Access to the substation site for both construction and operation would be gained through the solar facilities internal road network from its main access on East Primm Boulevard.

3.1.2.7 Ground Disturbance

Ground disturbance areas and earth moving quantities, including vehicle emissions for the site preparation at the substation location are included within the SSSP facilities application. Temporary construction fencing including desert tortoise fencing would be installed.

Upon completion of the site preparation, SCE would construct a prefabricated concrete panel wall enclosing the Primm Substation. The wall would be designed to prevent desert tortoise from burrowing under the panels. The wall would include the installation of a loop of visible razor wire around the entire perimeter. Up to four gates would provide entry into the substation on paved driveways. Surface drainage improvements would be required as part of SCEs below grade construction.

Table 3.1-A below provides the approximate area of land disturbance at the Primm Substation site within the substation perimeter wall and approximate volume and type of materials that would be used or disposed by SCE during Substation construction.

Table 3.1-A: Substation Cut and Fill Grading Summary

Element	Material	Approximate Surface Area (Square Feet)	Approximate Volume (Cubic Yards)
Internal Driveways, Net (Cut)	Soil	28,000	1,000
External Roads, Net (Cut)	Soil	20,000	700
Substation Equipment Foundations, (Cut)	Soil	5000	700
Cable Trench, (Cut)	Soil	4000	400
Wall Foundation, (Cut)	Soil	1,700	100

Note: Approximately 2,900 cubic yards of soil would be permanently retained within the overall project site.

Table 3.1-B: Substation Ground Surface Improvement Materials

Element	Material	Approximate Surface Area (Square Feet)	Approximate Volume (Cubic Yards)
Access Road Surface Area	Aggregate Base	20,000	800
Internal Road Surface Area	Asphalt Concrete Aggregate Base	28,000	450 550
Gravel Surfacing	Rock	150,000	1,800
Slope Erosion Protection	Gunite	2,500	20
Wall Foundation	Concrete	1,700	100

Element	Material	Approximate Surface Area (Square Feet)	Approximate Volume (Cubic Yards)
Equipment Foundations	Concrete	4800	615

3.1.2.8 Substation Lighting

Lighting at the proposed Primm Substation would consist of high-pressure sodium, low intensity lights located in the switchracks and in areas of the yard where operating and maintenance activities may take place during evening hours for emergency/scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The maintenance lights would be directed downward to reduce glare outside the facility. A light, indicating the operation of the rolling gate, would automatically turn on once the gate begins to open and would turn off shortly after the gate is closed.

3.1.2.9 Substation Perimeter

The proposed substation would be enclosed on all sides by an eight-foot high prefabricated concrete wall with a visible 18 to 24-inch diameter coil of razor wire attached to barbed wire.

3.1.3 Modifications to Existing Substation Description

Modifications to existing SCE substations would consist of but may not be limited to the following work: 1) Install and/or reset SPS and protection relays in the existing MEER at Ivanpah Substation, 2) Install and/or reset SPS and protection relays in the existing 220 kV relay room at Eldorado Substation, 3) Install telecommunications channel equipment for the RTU circuits at Lugo Substation 220 kV, and 4) Reset protection relays at outlying substations.

3.1.4 220 kV Transmission Line Description

The Proposed Project would include the following 220 kV transmission line elements:

3.1.4.1 Transmission Line and Related Structures

SCE's transmission line requirements for the Primm Substation interconnection to the Eldorado-Ivanpah No. 2 220 kV Transmission Line would consist of the following components: 1) 220 kV transmission line loop-in and transmission line re-route, 2) 220 kV Transmission Line structure modification/replacement/removal, and 3) 220 kV gen-tie termination into Primm Substation. Each of these components is described below.

3.1.4.2 220 kV Transmission Line Loop-In Design

The Proposed Project would connect Primm Substation to the Eldorado-Ivanpah No. 2 220 kV Transmission Line via loop-in transmission segments forming the Eldorado-Primm 220 kV Transmission Line and the Ivanpah-Primm 220 kV Transmission Line. This work would include modifying a segment of the Eldorado-Ivanpah 220 kV transmission lines in the vicinity of the construction site as noted in Figure 3.1-A. Each leg of the transmission line modification would be approximately 750 feet long into the substation on each end via new Right of Way (ROW) and transmission structures (see Figure 3.1-C). The transmission line would require a minimum of 100 feet wide ROW. The proposed loop-in of the Eldorado-Ivanpah No. 2 220 kV Transmission Line would require approximately four double circuit transmission lattice steel tower (LST) structures to enter Primm Substation.

These 220 kV structures would be constructed outside of the Primm Substation wall. Existing 220 kV H-frame structures would be used to re-route the Eldorado-Ivanpah No. 1 and No. 2 220 kV Transmission Lines toward the Primm Substation with the No. 2 line making a physical connection to the 220 kV switchrack. Eldorado-Ivanpah No. 1 would jumper between the two structures outside the fence with no connection to the substation switchrack. The conductor utilized would be a 2-bundle 1590 kcmil "Lapwing" Aluminum Conductor Steel Reinforced (ACSR) conductor per phase and ½ inch extra high strength steel (EHS) cable and/or optical ground wire (OPGW).

3.1.4.3 Existing 220 kV Transmission Line Structure Modification/Replacement Design

To support the loop-in, existing double circuit transmission structures may be modified, replaced, or removed. However, the exact number of towers to be modified would be determined during detailed engineering.

3.1.4.4 220 kV Generation Tie Line Extension Design

The proposed Primm Substation design would involve interconnecting a 220 kV gen-tie line segment into a 220 kV position. There would be one structure outside the SCE-owned Primm Substation facilities to support connection of the customer gen-tie. SCE would connect the gen-tie from the dead end structure to the appropriate 220 kV position inside Primm Substation. The span needed for this connection is estimated to be up to 300 feet depending on the location of the transmission line tower relative to Primm Substation and SCE property boundary line. Additional spans and structures may be required. The conductor utilized would be a 2-bundle 1590 kcmil "Lapwing" ACSR per phase or approved equal per SCE standard and in agreement with the developer.

3.1.4.5 Transmission Structure Types

The 220 kV transmission route of the proposed project would utilize LSTs.

Table 3.1-C: Typical Transmission Structure Dimensions

Type of Structure	Approximate Number of Structures	Approximate Height Above Ground	Approximate Auger Hole Depth	Approximate Auger Diameter
Double-Circuit LSTs	5	110 to 150 feet	30 to 40 feet	3 to 5 feet

Note 1: Specific tower height and spacing would be determined upon final engineering and would be constructed in compliance with National Electrical Safety Code (NESC) requirements.
Note 2: The specific number of structures and tower types would be determined upon detailed engineering.

On dead-end structures, the insulators would be arranged in a horizontal "parallel" configuration consisting of two polymer insulators.

The proposed new reconfigured Eldorado-Primm 220 kV Transmission Line and the proposed new reconfigured Ivanpah- Primm 220 kV Transmission Line would be strung with two-bundled 1590 kcmil ACSR "Lapwing" with non-specular finish.

An overhead ground wire would be located on the peak of each transmission structure. The 220 kV LSTs would utilize one overhead ground wire. The majority of the line would use Optical Ground Wire (OPGW) approximately 0.7 inch in diameter. A 0.5 inch diameter high strength steel cable would be used or a combination of fiber optic cable and conduit may be installed in trenches for continuity of OPGW cables.

The approximate dimensions of the proposed structure types are shown in Figure 3.1-C, Transmission Structures, and summarized in Table 3.1-C, Typical Transmission Structure Dimensions.

Approximately five LSTs would be used for the proposed Project. The LSTs would have an approximately 20' x 20' to 40' x 40' footprint and extend approximately 110' to 150' above ground. Each LST would be attached to four concrete foundations that would be approximately three to five feet in diameter and would extend underground approximately 30' to 40' with approximately one to four feet of concrete visible above ground. The LSTs would be steel structures with a dulled galvanized finish.

Transmission facilities 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 (Avian Power Line Interaction Committee, 2006).

Figure 3.1-B: Reference Eldorado-Ivanpah No. 1 and No. 2 220 kV Transmission Lines

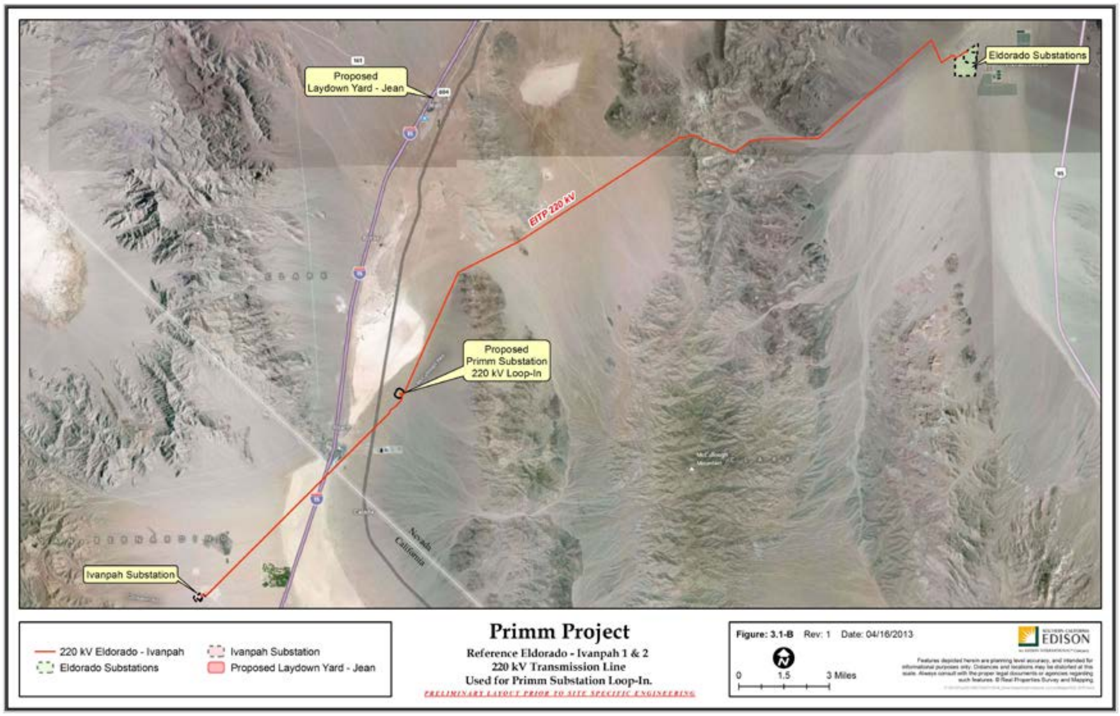
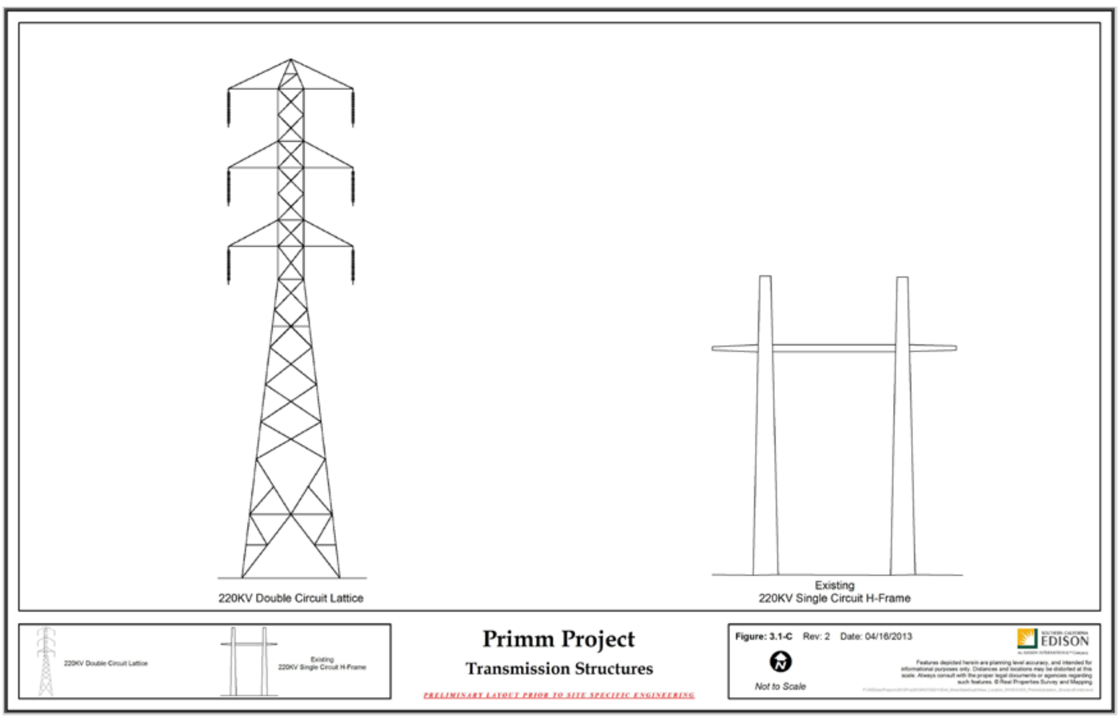


Figure 3.1-C: Transmission Structures



3.1.5 Telecommunications Description

Telecommunications infrastructure would be added to connect the Proposed Project to SCE's telecommunications system and would provide Supervisory Control and Data Acquisition (SCADA), protective relaying, data transmission, and telephone services for the Proposed Project and associated facilities.

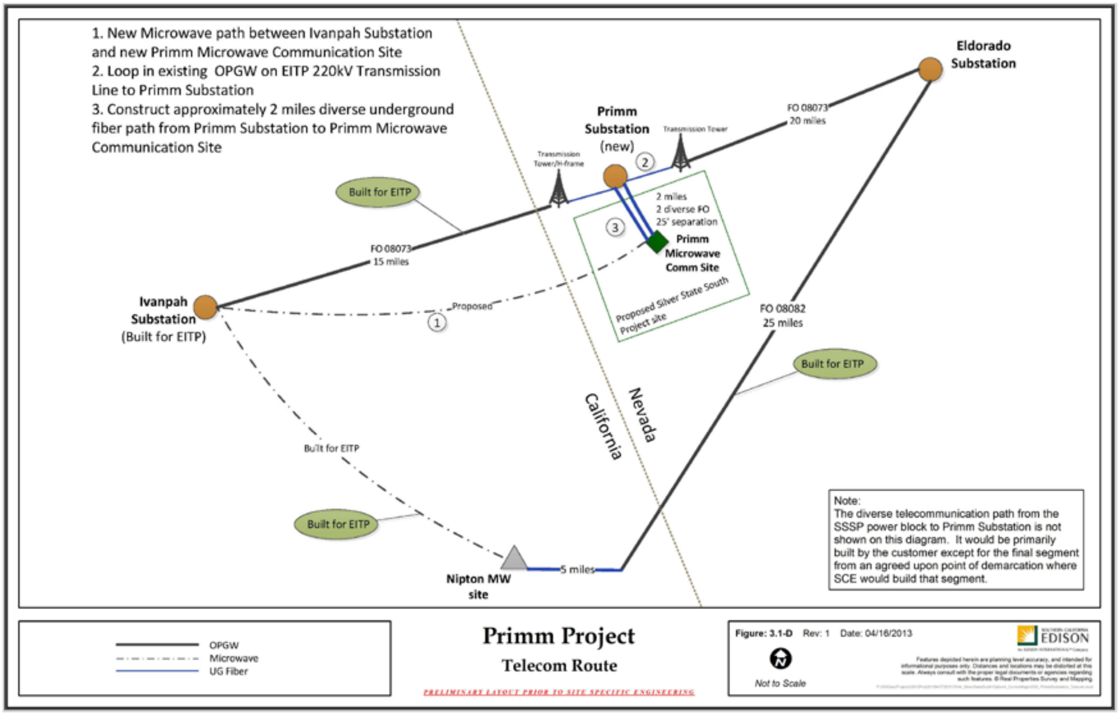
The new substation would include a MEER as described in Section 3.1.2.3, Mechanical and Electrical Equipment Room which would house project related telecommunications equipment.

A microwave antenna would be installed on a 185-foot, 4-legged, steel tower at a site within the boundary of the SSSP. A typical microwave tower site would require approximately 350 cubic yards to 450 cubic yards of concrete for the Primm Microwave Communication Site foundation.

The proposed Project would require installation of fiber optic communication cables, conduit, underground structures, and other telecommunications facilities. This equipment is required to provide diverse path routing of communication paths for the SSSP interconnection, and to provide communication equipment redundancy at the SSSP power block.

As described above, a new microwave tower site, to facilitate the diverse communication path requirements would be installed. Other facilities would include construction of a telecommunications room at Primm Substation. The scope of work would also incorporate the installation of communication paths and equipment between Primm Substation, the Primm Microwave Communication Site, Eldorado Substation, Ivanpah Substation, Lugo Substation, and the SSSP power block. The installation of Remote Terminal Units (RTU) at the SSSP power block would be required.

Figure 3.1-D: Proposed Telecommunications Route



3.1.6 Distribution

3.1.6.1 Distribution System Facilities

The scope of work related to the extension and construction of distribution facilities outside of Primm Substation and the Primm Microwave Communication Site would not be performed by SCE. NV Energy would provide the distribution facilities needed for electrical service for the Primm Substation station light and power (SL&P) service, and to the Primm Microwave Communication Site. Construction power for the Primm Substation site would be provided by NV Energy as well as by SCE provided temporary generators. Temporary generators would also be used for construction power required for the Primm Microwave Communication Site. It is anticipated that SCE would receive service at an SCE owned metering pedestal and would provide the downstream electric facilities within Primm Substation and within the Primm Microwave Communication Site. Described in the sections below are scopes of work that would be performed for the following:

3.1.6.2 Distribution Facilities for the Primm Substation Temporary Power Requirement

NV Energy and/or SCE would provide electrical facilities that would include risers, poles, down guys, anchors, panels, pedestals, metering enclosures, conduit, cable, underground structures, etc. to facilitate temporary electrical service(s) for constructing Primm Substation. NV Energy would construct an overhead 12 kV distribution line to the proposed Primm Substation Site and install an overhead transformer bank to provide temporary service to a SCE owned metering pedestal. The SCE owned temporary electrical facilities would be within the area where substation grading would be performed. Temporary power requirements for construction of Primm Substation would be a 200 amp, 120/240 volt, 3-phase, 4-wire panel. However, if it is more economical, all or part of the temporary power required to construct Primm Substation would be provided by a temporary generator. This service point from NV Energy would also likely act as the same Primm Substation SL&P service described below.

3.1.6.3 Distribution Facilities for the Primm Substation Station Light and Power Service

NV Energy and/or SCE would provide the electric facilities which may include poles, down guys, anchors, conduit, wires, man holes, pull boxes, risers, panels, pedestals, transformers, metering enclosures, etc. to facilitate electric service for the Primm Substation SL&P service. The associated land disturbance for the above SCE scope of work would likely be accounted for within the area where substation grading would be performed.

3.1.6.4 Distribution Facilities for the Primm Microwave Communication Site

NV Energy and/or SCE would provide the electrical facilities that would include risers, poles, down guys, anchors, panels, pedestals, metering enclosures, etc. to facilitate temporary and/or permanent electrical service for the Primm Microwave Communication Site. NV Energy would provide the 12 kV distribution line and transformer as well as service to the site. SCE would receive service at a metering pedestal. The SCE owned facilities would be within the area of the Primm Microwave Communication Site. The service would be a 200 amp, 120/240 volt, single phase, 3-wire meter panel.

3.1.6.5 Proposed Distribution System Facilities provided by NV Energy

Distribution facilities to provide service for Primm Substation and the Primm Microwave Communication Site would be constructed and served by NV Energy. However, in order to provide a project description for the purpose of this document, SCE describes the proposed distribution facilities in accordance with SCE construction standards and guidelines for the proposed scope of work that includes electrical service to SCE's proposed Primm Substation and SCE's proposed Primm Microwave Communication Site.

Note: NV Energy's construction methods and practices are subject to change based upon final engineering.

Distribution Facilities for Primm Substation and the Primm Microwave Communication Site

NV Energy would install a 12 kV distribution line extension to serve SCE's proposed Primm Substation. It is assumed that the 12 kV distribution line would be extended from an existing pole just north on the west side of the bridge on East Primm Boulevard. The bridge along East Primm Boulevard is located approximately 1,500 feet west of the Big Horn Power Plant in Primm, Nevada.

From the existing 12 kV distribution pole located approximately 240 feet north of the bridge on the west side, the overhead 12 kV distribution line is assumed to be extended south, to East Primm Blvd., and would then be constructed for approximately 7,000 feet east along East Primm Boulevard, past the existing Big Horn Power Plant. From this point a tap line would be extended south for approximately 1,500 feet, to feed SCE's proposed Primm Microwave Communication Site. The tap line would transition underground and terminate on a service panel pedestal that serves SCE's Primm Microwave Communication Site.

The 12 kV distribution line running on the north side of the Big Horn Plant would then make a ninety degree turn and travel due north along an access road for approximately 8,500 feet. The 12 kV distribution line would then veer to the northwest and then travel west for an approximately additional 1,500 feet. At this location outside of Primm Substation a transformer bank, riser, conduit, and cable would be installed to provide service to the SCE metering pedestal.

Note: NV Energy's construction methods and practices, as well as preliminary construction equipment and workforce estimates, are subject to change based upon final engineering.

Overhead Construction

Approximately 125 new distribution poles are anticipated to be needed to construct the overhead 12 kV distribution line. Structural components and distribution equipment would be shipped by truck to the construction site. The new poles and associated equipment would then be erected in the required location. The proposed line extension would be located on previously disturbed area. The permanent ground disturbance for each pole installation would typically be approximately 5 sq. ft. per pole and 0.1 sq. ft. per pole anchor.

The installation of a typical new electrical distribution pole line section would be done before the conductor is energized. Isolation switches where available would be used to de-energize existing circuitry before the newly constructed distribution circuitry is attached to the existing distribution infrastructure. For each new pole, a hole would typically be dug using a digger truck or possibly hand-dug if inaccessible by truck. The new pole would then be set in the hole and backfilled with soil which would be tamped for compaction. Appropriate components such as cross arms, insulators, down guys and anchors, transformers, fuse holders, lightening arresters, conductor, and other associated materials and equipment as necessary, would be installed on the new pole to accommodate the distribution circuit conductor. Additional distribution facilities such as transformers, capacitors, regulators, risers, and other associated materials and equipment may be installed on individual poles as necessary along the route.

Underground Construction

It is anticipated that the proposed NV Energy overhead 12 kV distribution line extensions would terminate in proximity to SCE's Primm Microwave Communication site and SCE's Primm Substation on a pole containing overhead distribution transformer(s), fuse holders, lightning arresters, down guy(s) and anchor(s). Downsteam of the transformer(s) at each location, a riser and underground service conduit and cable would be installed to connect the service pedestal to the overhead distribution transformer(s). A trench approximately 150 feet long and roughly 3 feet deep and 1 foot wide would be dug along the underground distribution service route, to facilitate installing conduit for cable from structure to structure, and /or structure to pole. A handhole may be required for pulling or splicing purposes. For this line section, a 3-4-inch conduit would be placed inside the trench from the last overhead pole to the SCE owned metering pedestal. A small concrete pad would be installed for the SCE metering pedestal to be anchored to. Either the original spoils or a layer of slurry would be poured over the conduit, and the trench would be backfilled. Once the underground conduit and/or structures are installed, a process of pulling the cable through these conduits would be used. The distribution power cables would then be terminated as required at the service pedestals.

3.1.6.6 Distribution System Installation

The electric service facilities within Primm Substation and within the Primm Microwave Communication Site would be provided by SCE. The proposed man power requirements are included within the applicable substation construction section and telecommunications sections of this technical description.

3.2 Proposed Project Construction Plan

The following subsections describe the construction activities associated with the Proposed Project.

3.2.1 General Construction

3.2.1.1 Staging Yards

Construction of the proposed Project would require the establishment of temporary staging yards. Staging yards would be used as a reporting location for workers, vehicle and equipment parking, and material storage. The yard may also have construction trailers for supervisory and clerical personnel. Staging yards may be lit for staging and security. Normal maintenance and refueling of construction equipment would also be conducted at these yards. All refueling and storage of fuels would be in accordance with the Storm Water Pollution Prevention Plan (SWPPP).

SCE anticipates using one or more of the possible locations listed in Table 3.2-A, Potential Staging Yard Locations, as the staging yard(s) for the proposed Project. Typically, each yard would be approximately 2 to 5 acres in size, depending on land availability and intended use. Preparation of the staging yard would include temporary perimeter fencing and depending on existing ground conditions at the site, include the application of gravel or crushed rock. Any land that may be disturbed at the staging yard would be restored to preconstruction conditions or to the agreed upon requirements of the landowner following the completion of construction for the proposed Project.

Materials commonly stored at the substation construction staging area would include, but not be limited to portable sanitation facilities, electrical equipment (e.g. circuit breakers, disconnect switches, lightning arresters, transformers, vacuum switches, steel beams), rebar, foundation cages, conduit, insulators, conductor and cable reels, pull boxes, and line hardware.

Materials commonly stored at the transmission, and/or telecommunications construction staging yards would include, but not be limited to, construction trailers, construction equipment, portable sanitation facilities, steel bundles, steel/wood poles, rebar for footing cages, conductor and overhead optical ground wire (OPGW) reels, hardware, insulators, cross arms, signage, consumables (such as fuel and filler compound), waste materials for salvaging, recycling, or disposal, and Best Management Practice (BMP) materials (straw wattles, gravel, and silt fences).

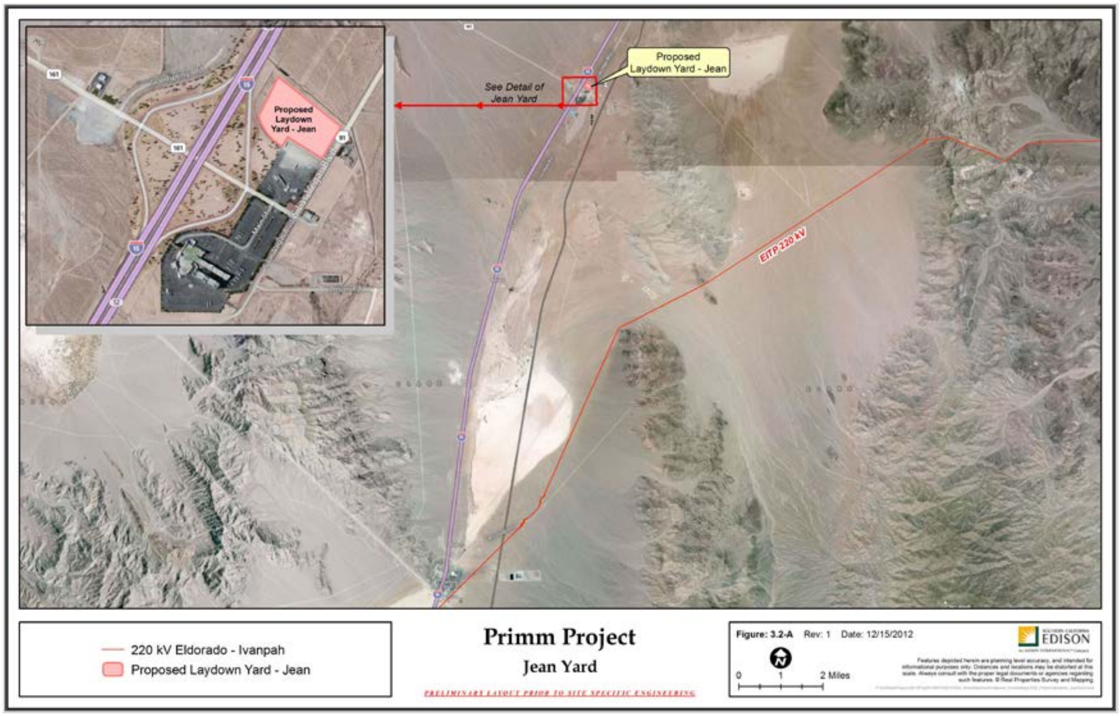
A majority of materials associated with the construction efforts would be delivered by truck to designated staging yards, while some materials may be delivered directly to the temporary transmission construction areas.

Transmission construction areas serve as temporary working areas for crews and where project related equipment and/or materials are placed at or near each structure location, within SCE ROW. Table 3.2-D, Land Disturbance Table identifies the approximate land disturbance for these construction area dimensions for the proposed Project.

Table 3.2-A: Potential Staging Yard Locations

Yard Name	Location	Condition	Approximate Surface Area	Project Component
Primm Substation South Yard	Adjacent to Primm Substation	Undisturbed	5 acres	Substation, Transmission, and Telecommunications
Jean Yard	Jean, Nevada	Disturbed	5 acres	Substation, Transmission, and Telecommunications
Ivanpah Yard	100302 North Yates Well Road, CA 92366	Disturbed	2 acres	Substation, Transmission, and Telecommunications

Figure 3.2-A : Jean Yard



3.2.1.2 Storm Water Pollution Prevention Plan

The proposed Project would be covered by the Construction Storm Water General Permit (NVR 100000), which is regulated by the Nevada Division of Environmental Protection, Bureau of Water Pollution Control. As required by NVR 100000, a SWPPP would be developed, which would encompass specific Best Management Practices for material delivery/storage, material use, spill prevention controls, solid waste management, and hazardous waste management. The SWPPP would be based on detailed engineering design and would include project components.

3.2.1.3 Dust Control

During construction, migration of fugitive dust from the construction sites would be limited by control measures set forth by the Clark County Department of Air Quality, Section 41 and Sections 90 through 94. These measures may include the use of water trucks and other dust control measures.

3.2.1.4 Traffic Control

Construction activities within public street ROW would require the use of a traffic control service and all lane closures would be conducted in accordance with local ordinances and city permit conditions.

3.2.1.5 Survey

Construction activities would begin with the survey of existing underground utilities. SCE would notify all applicable utilities via underground service alert to locate and mark existing utilities and conducting exploratory excavations (potholing) as necessary to verify the location of existing utilities. SCE would secure encroachment permits for trenching in public streets, as required.

3.2.1.6 Desert Tortoise Fencing

Temporary desert tortoise exclusion fence would be installed prior to construction along the boundaries of construction areas in accordance with specifications and guidelines of Bureau of Land Management and U.S. Fish and Wildlife Service. Regular inspections and maintenance will be required to ensure exclusion integrity.

3.2.2 Primm Substation Construction

The following section describes the construction activities associated with installing the components of Primm Substation for the proposed Project.

3.2.2.1 Site Preparation and Grading

The substation site would be prepared by clearing existing vegetation within the boundaries of the Primm Substation site. Once vegetation clearance is completed, the site would be graded in accordance with approved grading plans and a temporary chain link fence would be installed beyond the substation perimeter.

3.2.2.2 Below-Grade Construction

After the substation site is graded, below-grade facilities would be installed. Below-grade facilities include, for example, a ground grid, cable trenches, equipment foundations, substation perimeter foundations, conduits, duct banks, vaults, and basements. The design of the ground grid would be based on soil resistivity measurements collected during a geotechnical investigation prior to these construction activities.

3.2.2.3 Above-Grade Construction

Above-grade installation of substation facilities such as buses, switchracks, disconnect switches, circuit breakers, steel support structures, perimeter wall, self-contained restroom facility, and the MEER would commence after the below-grade structures are in place.

3.2.2.4 Substation Land Disturbance Table

Table 3.2-B Substation Estimated Land Disturbance

Project Feature	Quantity	Disturbance Area Calculation	Acres Disturbed During	Acres to be Restored	Acres Permanently

		(Acres)	Construction		Disturbed
Substation Graded Pad	1	6	7	0	7
Access Driveways and Buffers	2	1	Note 1	0	Note 1

Note 1: Substation access driveways and buffers would be within the 7-acre permanent disturbance area.

3.2.2.5 Substation Construction Equipment and Workforce Estimates Table

Table 3.2-C Substation Construction Equipment and Workforce Estimates

Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs./Days)
Backhoe,	90	Diesel	2	2	120	8 / 5
Skid Steer	80	Diesel	2	2	120	8 / 5
Forklift	90	Diesel	1	1	320	8 / 5
Water truck	200	Diesel	1	1	320	8 / 5
Boom truck	300	Diesel	1	1	300	8 / 5
Drill Rig	300	Diesel	1	1	100	8 / 5
Dump Truck	300	Diesel	2	2	300	8 / 5
Flat Bed Truck	300	Diesel	1	1	320	8 / 5
Cement Mixer Truck	300	Diesel	5	5	45	8 / 5
Generator	49	Diesel	2	N/A	320	8 / 5

Office trailers	0	N/A	3	N/A	320	8 / 5
Tool Trailer	N/A	Electric	2	N/A	320	8 / 5
Crew Truck	250	Diesel or Gasoline	3	3	320	8 / 5
Structural Crew	N/A	N/A	N/A	15	150	8 / 5
Electrical Crew	N/A	N/A	N/A	30	200	8/ 5

Note: For substation construction the schedule durations includes a standard 8:00 a.m. to 5:00 p.m. work schedule. However, based on project objective requirements, a longer work shift or modified work days and hours may be required as well as additional crews to meet the project schedule.

3.2.2.6 Modifications at Other Facilities

Modifications to existing SCE substations would consist of, but may not be limited to, the following work: 1) Install and/or reset SPS and protection relays in the existing MEER at Ivanpah Substation, 2) Install and/or reset SPS and protection relays in the existing 220 kV relay room at Eldorado Substation, 3) Install telecommunications channel equipment for the RTU circuits at Lugo Substation, and 4) Reset protection relays at outlying substations.

3.2.3 Transmission Line Installation

The following sections describe the construction activities associated with installing the transmission line segments for the proposed Project. Construction activities would consist of the receiving and handling of construction materials, existing access road rehabilitation, creation of new access roads, site preparation, assembly and erection of structures, removal of existing facilities, stringing of conductors, and site cleanup.

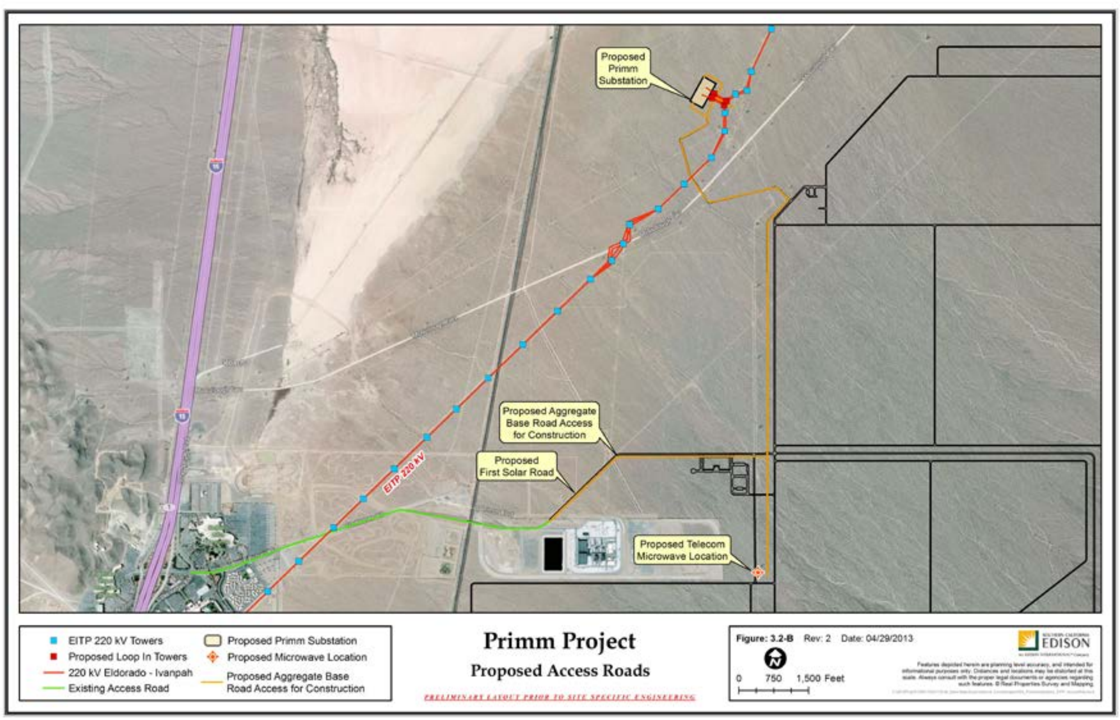
3.2.3.1 Access and Spur Roads

This portion of the SSSP would involve construction within existing and new ROWs. Existing public roads, as well as existing transmission line roads would be used as much as possible during construction of the proposed Project. However, the proposed Project would require new transmission line roads to access the new transmission line segments and structure locations. Transmission line roads are classified into two groups; access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line ROWs. Spur roads are roads that lead from access roads and terminate at one or more structure sites.

Rehabilitation work may be necessary in some locations along the existing transmission line roads to accommodate construction activities. This work may include the re-grading, widening, and repair of existing access roads, spur roads, and associated drainage features. These roads would be cleared of vegetation; blade-graded to remove potholes, ruts, and other surface irregularities; and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet with 2 feet of shoulder on each side (depending upon field conditions).

Similar to rehabilitation of existing roads, all new road alignments would first be cleared and grubbed of vegetation; roads would be blade-graded to remove potholes, ruts, and other surface irregularities; fill material would be deposited where necessary; and roads would be compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet with 2 feet of shoulder on each side, but may be wider depending on detailed engineering requirements and field conditions. New road gradients would be leveled so that any sustained grade would not exceed 14 percent or as otherwise defined during detailed engineering. Drainage features would be installed where necessary to ensure adequate drainage of the road to reduce erosion and rutting. All curves would have a radius of curvature of not less than 50 feet measured at the center line of the usable road surface. The new roads would typically have turnaround areas near the structure locations.

Figure 3.2-B : Proposed Access Roads



3.2.3.2 Structure Site Preparation

The new structure pad locations and laydown/work areas would first be graded and/or cleared of vegetation as required to provide a reasonably level and vegetation-free surface for structure installation. Sites would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the structure footings. The graded area would be compacted to at least 90 percent relative density, and would be capable of supporting heavy vehicular traffic.

Structure foundations for each lattice steel tower (LST) would consist of four poured-in-place concrete footings. Actual footing diameters and depths for each of the structure foundations would depend on the soil conditions and topography at each site and would be determined during final engineering.

The foundation process begins with the drilling of the holes for each type of structure. The holes would be drilled using truck or track mounted excavators with various diameter augers to match the diameter requirements of the structure type. LSTs typically require an excavated hole approximately three feet to five feet in diameter at approximately 30 feet to 40 feet deep. The excavated material would be distributed at each structure site, used to backfill excavations from the removal of nearby structures (if any), or used in the rehabilitation of existing access roads. Alternatively, the excavated soil may be disposed of at an off-site disposal facility in accordance with all applicable laws. It is anticipated that approximately 465 cubic yards of soils could be disposed of off-site.

Following excavation of the foundation footings, steel reinforced rebar cages would be set, positioned, and survey verified before concrete could be placed. Steel reinforced rebar cages and stub angles may be assembled at staging yards and delivered to each structure location by flatbed truck or assembled at the job site. Depending upon the type of structure being constructed, soil conditions, and topography at each site, LSTs would require approximately 25 to 140 cubic yards of concrete delivered to each structure location.

Slight to severe ground caving is anticipated along the preferred route during the drilling of the LST foundations due to the presence of loose soils. The use of water, fluid stabilizers, drilling mud and/or casings would be made available to control ground caving and to stabilize the sidewalls from sloughing. If fluid stabilizers are utilized, mud slurry would be added in conjunction with the drilling. The concrete for the foundation footing would be pumped from the bottom of the hole upwards displacing the mud slurry as the concrete is poured. Mud slurry brought to the surface is typically collected in a pit adjacent to the foundation and/or vacuumed directly into a truck to be reused or discarded at an off-site disposal facility in accordance with all applicable laws.

SCE approved concrete supply facilities would be used during construction. Concrete samples would be drawn at time of pour and tested to ensure required strengths were achieved. A normally specified SCE concrete mix typically takes approximately 28 calendar days to cure to a required strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erection of the structure.

3.2.3.3 Temporary Bypass Facilities

SCE may temporarily transfer the Eldorado-Ivanpah No. 2 220 kV conductor to temporary structures during the removal and replacement of the Eldorado-Ivanpah No. 1 220 kV structures. Upon completion of the construction of the 220 kV replacement structures and dismantling of the existing 220 kV structure to a level below the conductor attachment height, the existing conductor would be transferred over from the temporary structures and attached to the new 220 kV structures. The exact number of temporary transmission structures and the related ground disturbance will not be known until detailed engineering is performed.

3.2.3.4 Lattice Steel Tower Installation

Lattice Steel Towers (LST) would be assembled within the construction areas at each tower site. See Table 3.2-D for approximate laydown disturbance dimensions. Structure assembly begins with the hauling and stacking of steel bundles, per engineering drawing requirements, from a staging yard to each structure location.

This activity requires use of trucks with flatbed trailers and a rough terrain forklift. After steel is delivered and stacked, crews would proceed with assembly of the leg extensions, body panels, boxed sections, and cages. Assembled sections would be lifted into place with a crane and secured by a combined erection and torquing crew.

3.2.3.5 Counterpoise

Transmission structures located within the substation boundary would be grounded to the substation ground grid. Foundations for 220 kV structures located more than 700 feet outside a substation would have adequate grounding.

If adequate foundation to ground resistance criteria cannot be met with ground rods, a counterpoise system would be installed. Counterpoise are additional ground wires installed below ground adjacent to and attached to the structure to increase conductivity between the structure and the ground so that adequate grounding can be achieved.

3.2.3.6 Wire Stringing

Wire stringing activities would be in accordance with SCE common practices and similar to process methods detailed in the IEEE Standard 524-2003 (Guide to the Installation of Overhead Transmission Line Conductors).

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire stringing activities. Advanced planning by supervision is required to determine circuit outages, pulling times, and safety protocols for ensuring that the safe installation of wire is accomplished.

Wire stringing includes all activities associated with the installation of the primary conductors onto transmission line structures. These activities include the installation of conductor, ground wire (OHGW/OPGW), insulators, stringing sheaves (rollers or travelers), vibration dampeners, weights, suspension and dead-end hardware assemblies for the entire length of the route.

The following five steps describe typical wire stringing activities:

- Step 1: Planning: Develop a wire stringing plan to determine the sequence of wire pulls and the set-up locations for the wire pulling and tensioning equipment
- Step 2: Sock Line Threading: Typically a helicopter would fly a lightweight sock line from structure to structure, which would be threaded through rollers in order to engage a camlock device that would secure the pulling sock in the roller. However for the SSSP, a bucket truck may be utilized for this task in lieu of the helicopter. This threading process would continue between all structures through the rollers of a particular set of spans selected for a wire pull.
- Step 3: Pulling: The sock line would be used to pull in the conductor pulling rope and/or cable. The pulling rope or cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.
- Step 4: Sagging, and Dead-Ending: Once the conductor is pulled in, the conductor would be sagged to proper tension and dead-ended to structures.
- Step 5: Clipping-In: After the conductor is dead-ended, the conductors would be secured to all tangent structures; a process called clipping in. Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

3.2.3.7 Transmission Wire Pulling Locations

The wire stringing set-up locations associated with the Primm Project would be temporary and the land would be restored to its previous condition following completion of wire stringing activities. The set-up locations require level areas to allow for maneuvering of the equipment and, when possible, these locations would be located on existing roads and level areas to minimize the need for grading and cleanup. The number and location of these sites would be determined during detailed engineering. The approximate area needed for stringing set-ups associated with wire installation is variable and depends upon terrain. See Table 3.2-D for approximate size of pulling and tensioning equipment set-up areas. Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected based on availability of dead-end structures, conductor size, geometry of the line as affected by points of inflection, terrain, and suitability of stringing equipment set-up locations. Generally, pulling locations and equipment set-ups would be in direct line with the direction of the overhead conductors and established approximately a distance of three times the height away from the adjacent structure.

Each stringing operation consists of a puller equipment set-up positioned at one end and a tensioner equipment set-up with a wire reel stand truck positioned at the other end of the wire pull.

3.2.3.8 Transfer/Removal of Existing Structures/Facilities

The project would involve removing structures, conductor and associated hardware.

The following is proposed to be removed in the sequence below:

- Road work – Existing access roads would be used to reach structures, but some rehabilitation and grading may be necessary before removal activities would begin to establish temporary crane pads for structure removal.
- Wire-pulling locations - Wire pulling sites would be located along the existing utility corridor, and would include locations at dead-end structures and turning points.
- Conductor removal – The old conductor wire would be transported to a construction yard where it would be prepared for recycling.

Any existing transmission lines and telecommunication lines (where applicable) would be transferred to the new structures prior to removal of existing structures. Any remaining facilities that are not reused by SCE would be removed and delivered to a facility for recycling.

3.2.3.9 Transmission Land Disturbance Table

Table 3.2-D Transmission Approximate Land Disturbance Table

Project Feature	Project Quantity	Disturbed Acreage Calculation	Construction Disturbance Acreage	Temporary Disturbance Acreage	Permanent Disturbance Acreage
Construct New Lattice Steel Tower (1)	5	200' x 200'	4.6	3.7	0.9
Modify Ex. Structure (2)	2	200' x 200'	1.8	1.8	0
Structure Work Area Overlap	3	varies	-0.9	-0.9	-
220kV Conductor & OPGW Stringing Setup Areas (3)	2	varies	0.9	0.9	0
New Access Roads (4)	34,088	sqft	0.8	0	0.8
Road Construction Buffers	23,513	sqft	0.5	0.5	0.0
Material & Equipment Staging Area - Jean (5)	1	approx. 5 acres	5	5	0
Material & Equipment Staging Area - Ivanpah (5)	1	approx. 2 acres	2	2	0

Total Estimated (6)	**15**	**13**	**2**
Notes:			
1. Includes foundation installation, structure assembly & erection, conductor & OPGW installation; area to be restored after construction, portion of R/W within 25' of the Lattice Steel Tower to remain cleared of vegetation, would be permanently disturbed for each Lattice Steel Tower.			
2. Includes structure modification & assembly; conductor & OPGW installation; Area previously disturbed. Temporary disturbance area outside the 25' permanent tower clearance area to be restored after construction.			
3. Based on 7,500’ conductor reel lengths, number of circuits, and route design. Temporary disturbance in stringing areas to be restored after construction.			
4. Based on length of road in feet x road width of 14’-22' with 2' of berm on each side of road.			
5. Jean Yard is currently disturbed and graded. For restoration, any fencing and gravel installed will be removed from the site upon completion of the project.			
6. Disturbed acreage calculations are estimates based upon SCE’s preferred area of use for the described project feature, width of the existing right-of-way, and/or the width of the proposed right-of-way; they are subject to revision based upon detailed engineering and review of the project by SCE's Construction Manager and/or Contractor awarded to project.			
Footing / Base Volume and Area Calculations (approximate):			
LST: Depth - 40 ft, Diameter - 5 ft, Qty per tower - 4. Soil removed for footings (per tower) = 29 CYs x 4 = 116 CYs; Surface area (per tower) = 19.6 Sqft x 4 = 78.5 Sqft.			

3.2.3.10 Transmission Workforce and Construction Equipment Table

Table 3.2-E Transmission Construction Equipment and Workforce Estimates

CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY CONSTRUCT DOUBLE-CIRCUIT 220KV T/L LOOP-IN INTO NEW PRIMM SUB							
WORK ACTIVITY				**ACTIVITY PRODUCTION**			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Quantity
Survey (1)				**4**	**2**		**2 Miles**
1-Ton Truck, 4x4	300	Gas	2		2	8	
Staging Yard (2)				**4**			
1-Ton Truck, 4x4	300	Gas	1		Duration of Project	8	
Boom/Crane Truck	350	Diesel	1			4	
R/T Forklift	125	Diesel	1			4	
Water Truck	300	Diesel	1			8	
Roads & Landing Work (3)				**5**	**5**		**1 Mile & 5 Pads**
1-Ton Truck, 4x4	300	Gas	2		5	8	
Motor Grader	250	Diesel	1		5	6	
Track Type Dozer	150	Diesel	1		5	6	
Drum Type Compactor	100	Diesel	1		5	6	
Water Truck	300	Diesel	2		5	8	

CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY
CONSTRUCT DOUBLE-CIRCUIT 220KV T/L LOOP-IN INTO NEW PRIMM SUB

WORK ACTIVITY				ACTIVITY PRODUCTION			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Quantity
Backhoe/Front Loader	125	Diesel	1		5	6	
Lowboy Truck/Trailer	450	Diesel	1		2	8	
Remove Existing Conductor (4)				**14**	**4**		**2400 Circuit Feet**
1-Ton Truck, 4x4	300	Gas	3		4	8	
Manlift/Bucket Truck	250	Diesel	2		4	8	
Boom/Crane Truck	350	Diesel	2		4	8	
Static Truck/ Tensioner	350	Diesel	1		4	8	
Puller	350	Diesel	1		4	8	
Dump Truck	350	Diesel	1		4	8	
Lowboy Truck/Trailer	450	Diesel	1		4	4	
Install LST Foundations (5)				**7**	**10**		**5 LSTs**
1-Ton Truck, 4x4	300	Gas	3		10	4	
Boom/Crane Truck	350	Diesel	1		10	4	
Backhoe/Front Loader	125	Diesel	1		10	8	
Auger Truck	210	Diesel	1		10	8	
Dump Truck	350	Diesel	1		10	8	
Water Truck	300	Diesel	1		10	8	
Concrete Mixer Truck	350	Diesel	3		7	4	
LST Steel Haul (6)				**4**	**5**		**5 LSTs**
1-Ton Truck, 4x4	300	Gas	1		5	4	
R/T Forklift	125	Diesel	1		5	8	
Flat Bed Truck/ Trailer	400	Diesel	1		5	8	
LST Steel Assembly (7)				**8**	**10**		**5 LSTs**
1-Ton Truck, 4x4	300	Gas	3		10	4	
R/T Forklift	125	Diesel	1		10	8	
Boom/Crane Truck	350	Diesel	1		10	8	
Compressor Trailer	60	Diesel	1		10	8	
LST Erection (8)				**8**	**10**		**10 LSTs**
1-Ton Truck, 4x4	300	Gas	3		10	4	
Boom/Crane Truck	350	Diesel	1		10	8	
R/T Crane (L)	275	Diesel	1		10	8	
Compressor Trailer	60	Diesel	1		10	8	

CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY CONSTRUCT DOUBLE-CIRCUIT 220KV T/L LOOP-IN INTO NEW PRIMM SUB

WORK ACTIVITY				ACTIVITY PRODUCTION			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Quantity
Modify Existing Tubular Steel H-Frame (9)				**6**	**4**		**2 H-Frames**
1-Ton Truck, 4x4	300	Gas	2		4	4	
Boom/Crane Truck	350	Diesel	1		4	8	
R/T Crane (L)	275	Diesel	1		4	8	
Compressor Trailer	60	Diesel	1		4	8	
Install Conductor & OPGW (10)				**20**	**5**		**3000 Circuit Feet**
1-Ton Truck, 4x4	300	Gas	4		5	8	
Manlift/Bucket Truck	250	Diesel	2		5	8	
Boom/Crane Truck	350	Diesel	2		5	8	
R/T Crane (M)	215	Diesel	1		5	8	
Wire Truck/Trailer	350	Diesel	2		5	6	
Static Truck/ Tensioner	350	Diesel	1		5	8	
Sock Line Puller	300	Diesel	1		3	8	
Bull Wheel Puller	350	Diesel	1		3	8	
Sag Cat w/ winches	350	Diesel	2		5	4	
Spacing Cart	10	Gas	6		2	8	
Backhoe/Front Loader	125	Diesel	1		5	6	
Dump Truck	350	Diesel	1		5	8	
Lowboy Truck/Trailer	450	Diesel	1		3	4	
Hughes 500 E Helicopter		Jet A	1		2	8	
Fuel, Helicopter Support Truck	300	Diesel	1		2	8	
Restoration (11)				**7**	**3**		**1 Mile**
1-Ton Truck, 4x4	300	Gas	2		3	8	
Backhoe/Front Loader	125	Diesel	1		3	8	
Drum Type Compactor	100	Diesel	1		3	8	
Water Truck	300	Diesel	1		3	8	
Lowboy Truck/Trailer	450	Diesel	1		3	4	

Note: For transmission construction the schedule durations includes a standard 8 hour work schedule. However, based on project objective requirements, a longer work shift or modified work days and hours may be required as well as additional crews to meet the project schedule.

Crew Size Assumptions:

#1 Survey = one 4-man crew
#2 Staging Yards = one 4-man crew
#3 Roads & Landing Work = one 5-man crew
#4 Remove Existing Conductor = one 14-man crew
#5 Install Foundations for LSTs = one 7-man crew
#6 LST Steel Haul = one 4-man crew
#7 LST Steel Assembly = one 8-man crew
#8 LST Erection = one 8-man crew
#9 Tubular Steel H-Frame Modification = one 8-man crew
#10 Conductor & OPGW Installation = one 16-man crew
#11 Restoration = one 7-man crew

3.2.3.11 Energizing Transmission Lines

Energizing the new lines is the final step in completing the transmission construction. The Eldorado-Ivanpah No. 1 and No. 2 220 kV Transmission Lines would be de-energized in order to connect the new line segments to the existing system. To reduce the need for electric service interruption, de-energizing and re-energizing the existing lines may occur at night or during a time of year when electrical demands are low.

3.2.4 Telecommunications Construction

The following sections describe the construction activities associated with installing the telecommunications for the Proposed Project.

The Project would require the construction of two diverse, underground conduit systems and fiber optic cables from the Primm Substation MEER to Primm Microwave Communication Site. The project would also require the construction of one underground conduit system and fiber optic cable from the existing Telecom manhole to Primm Substation to provide protective relay circuits, Supervisory Control and Data Acquisition (SCADA) circuits, data, and telecommunication services.

***Underground Construction Activities*:** To accommodate the installation of fiber optic cable, the proposed routes would require the installation of approximately 22,996' of - 2- Schedule 40 PVC conduits and approximately twenty-six 4' x 4' x 6' communications-type manholes. Typically conduits are installed using the conventional trenching method. This method utilizes a backhoe fitted with an 18" bucket to excavate a 36" x 18" trench between structures, risers, and termination points. Conduit rests on a 1" sand cushion at the bottom of the trench. Conduit rests on a 1" sand cushion at the bottom of the trench. Where required, a layer of slurry is poured over the conduit for additional protection. A Fiber optic warning tape is installed 12" to 18" above the conduit. Excavated, native soil is replaced and compacted per industry specifications. Where required, 4' x 4' x 6' communications-type manholes are installed to provide pull and or splice points for the fiber optic cable. These structures can be installed up to 1200' apart. Manholes are installed in 5' x 7' excavation and have a final, surface dimension of, 5' x 5'. Conduit is terminated at factory installed termination points located on manhole walls. Final assembly of manhole requires installation of ceiling and lid. Where required, a 10' x 10' concrete apron is installed to prevent damage to lid. A 3/8" poly rope is installed by using a truck or trailer mounted air compressor to blow a parachute-type device through the conduit.

Conduit may be also installed via directional boring (trenchless) in lieu of trenching if required by SCE. This method requires 4’ x 4’ x 6’ deep excavations (bore pit) at each end of a bore-path. These excavations may be used to install communications manholes where required. Bore pits are used to launch or receive an operator-controlled drill head. During this process, a product called Bore-Gel (a mixture of water and bentonite) is pumped to the drill head via-hydraulic hose to control temperature and friction. Upon completion of bore, this fluid mix is pumped from the receive pit and transported off-site for filtration and re-use. Upon receipt of drill head, two 5” conduits are pulled back through the bore path. Unused excavations are backfilled with native soil and restored to original condition to the extent practicable.

Primm Substation-Primm Microwave Communication Site- Fiber Optic Cable Route No.1: Installation of approximately 11,198’ of fiber-optic cable throughout the proposed conduit system as follows; At the east wall of Primm Substation MEER; Install approximately 80’ new conduit southeast to a new 4’x4’x6’ communications structure (1). Continue approximately 612’ southeast to a new 4’x4’x6’ communications structure (2). Continue approximately 193’ south and 192’ southeast to a new 4’x4’x6’ communications structure (3). Continue approximately 898’ southeast to a new 4’x4’x6’ communications structure (4). Continue approximately 878’ southeast to a new 4’x4’x6’ communications structure (5). Continue approximately 621’ south to a new 4’x4’x6’ communications structure (6). Continue approximately 1,240’ south to new 4’x4’x6’ communications structure (7). Continue approximately 2,225’ south to new 4’x4’x6’ communications structure (8). Continue approximately 1,240’ south to new 4’x4’x6’ communications structure (9). Continue approximately 1,250’ south to new 4’x4’x6’ communications structure (10). Continue approximately 1,275’ south to new 4’x4’x6’ communications structure (11). Continue approximately 1,050’ south to new 4’x4’x6’ communications structure (12). Continue approximately 368’ south to new 4’x4’x6’ communications structure (13). Install approximately 75’ new conduit west to Primm Microwave Communication Site.

Primm Substation-Primm Microwave Communication Site- Fiber Optice Cable Route No.2: Installation of approximately 11,248’ fiber-optic cable throughout proposed conduit system as follows; at the east wall of Primm Substation MEER; Install approximately 70’ new conduit southeast to a new 4’x4’x6’ communication structure (14). Continue approximately 240’ southeast to a new 4’x4’x6’ communication structure (15). Continue approximately 211’ south and 140’ southeast to a new 4’x4’x6’ communication structure (16). Continue approximately 937’ southeast to a new 4’x4’x6’ communication structure (17). Continue approximately 927’ southeast to a new 4’x4’x6’ communication structure (18). Continue approximately 597’ south to a new 4’x4’x6’ communication structure (19). Continue approximately 1,340’ south to a new 4’x4’x6’ communication structure (20). Continue approximately 1,217’ south to a new 4’x4’x6’ communication structure (21). Continue approximately 1,292’ south to a new 4’x4’x6’ communication structure (22). Continue approximately 1,241’ south to a new 4’x4’x6’ communication structure (23). Continue approximately 1,255’ south to a new 4’x4’x6’ communication structure (24). Continue approximately 878’ south to a new 4’x4’x6’ communication structure (25). Continue approximately 427’ south to a new 4’x4’x6’ communication structure (26). Install approximately 75’ of new conduit west to Primm Microwave Communication Site.

Fiber Optic Cable: The communications and protection system would utilize two fiber optic cables.

Eldorado-Ivanpah 220 kV OPGW Reroute: Installation of approximately 550’ fiber-optic cable throughout the proposed conduit system as follows; at the existing Telecommunication structure M9301817 adjacent to Structure 158, install approximately 550’ of new conduit southwest to proposed structure within Silver State Substation boundary. (Figure 3.2-C).

Underground Fiber Optic Cable Installation: The fiber optic cable installation requires the installation of a 1” high density, poly-ethylene inner-duct throughout the conduit system. The fiber optic cable is installed in the inner-duct, using a factory-installed pull tape. For inner-duct and fiber installation, standard, truck-mounted, hydraulic pulling equipment is used.

Splicing Operations: SCE would use its standard equipment to access sites and perform splicing operations. At splice locations, ends of fiber optic cable are prepped by hand, and fusion-spliced in a climate-controlled truck-mounted enclosure. Splice locations would be determined prior to construction.

Project Access: Construction of SCE communications conduit system and fiber optic cable would utilize existing and project assigned access roads.

Lay-Down Areas: Construction of SCE communications conduit system and fiber optic cable would utilize the Primm Substation, Ivanpah Substation and Jean staging yards.

Labor Force and Construction Equipment: Conduit construction would be completed by an approved SCE contractor. Fiber optic cable installation and splicing would be completed by SCE personnel.

Figure 3.2-C : Eldorado – Ivanpah Re-Route

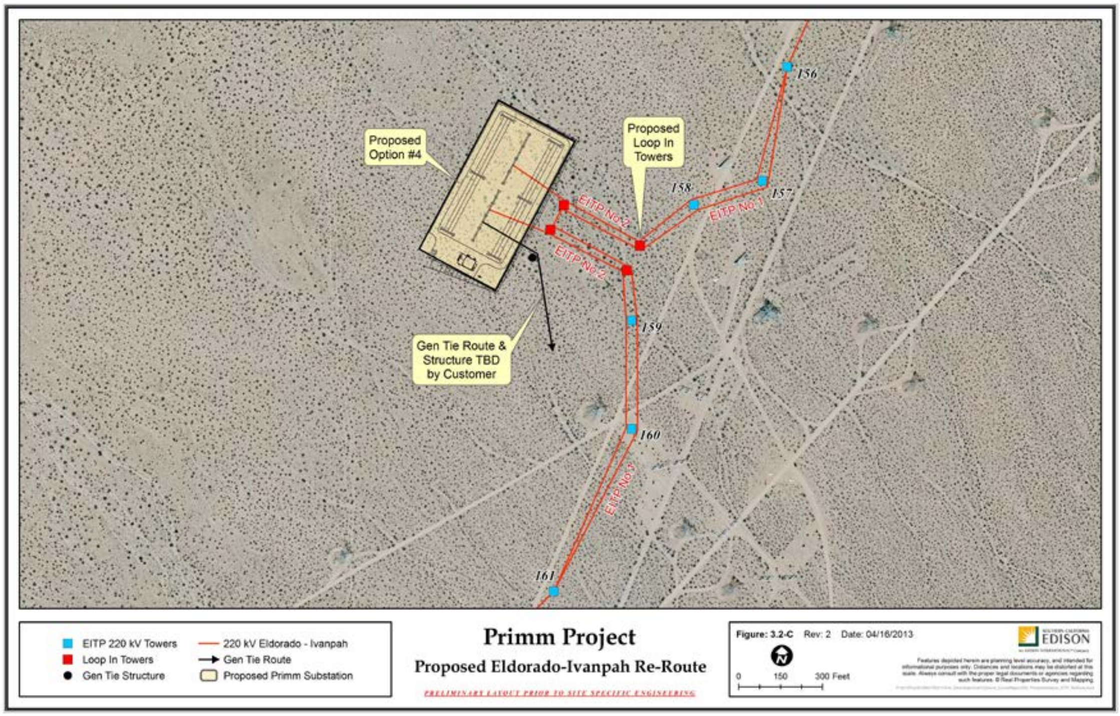


Figure 3.2-D : Primm Substation – Primm Microwave Communication Site Routes A & B

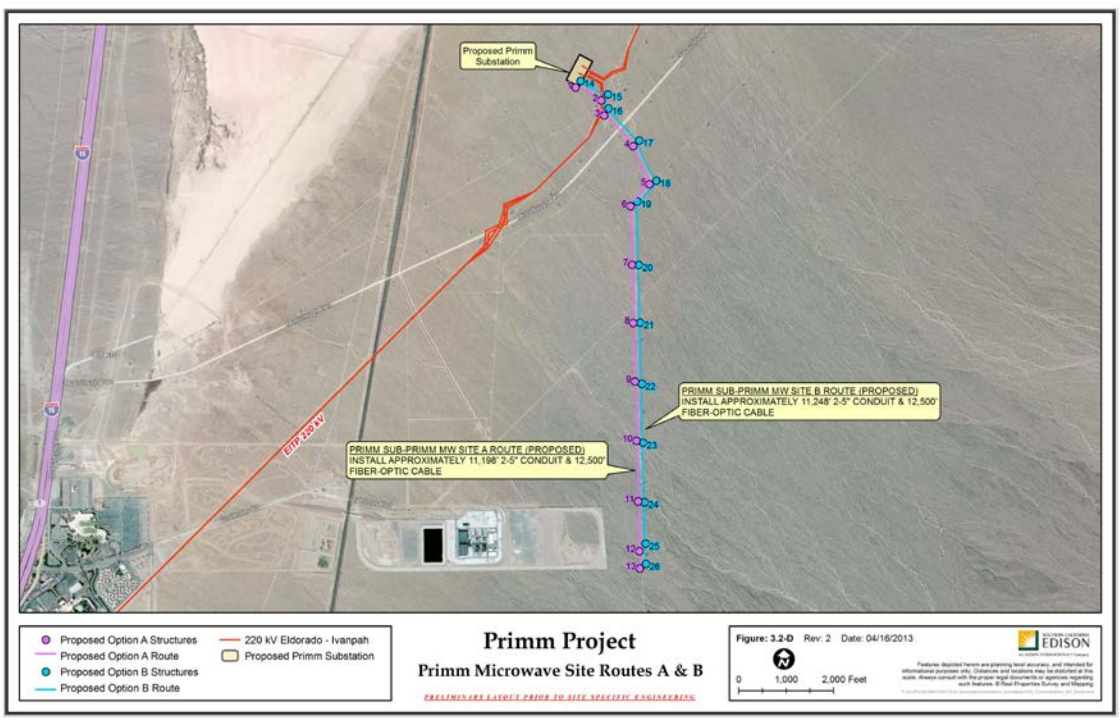


Table 3.2-F Telecommunication Construction Equipment and Workforce Estimates

Construction Element	Number of Personnel	Equipment Requirements	
Conduit Construction	6-8	2–Back-hoe(Diesel) 2 –Dump(Diesel) 1-Foreman Vehicle	1–Trailer Mounted Compressor 1-Water Truck
Receive and Load Out Materials	2	1 – 5-Ton Forklift (Diesel) 1 – Pick-up (Diesel)	
Fiber Install/splice	8	2-Altec T-40 Platform/boom 2-Altec Splicing (Diesel) 1–Foreman Vehicle	
Cleanup	4	2 – Bucket Trucks (Diesel) 1 – Pick-up (Diesel)	Cleanup

Table 3.2-G Telecommunication Substructure Construction Disturbance Table

ECS ACTIVITY	Site Quantity	Disturbed Acreage Calculation (L' x W')	Acres Disturbed During Construction	Acres to be restored	Estimated spoils (CF)
18 " x 36" Trench for conduit-(NO SLURRY)	1	25000 x 18	10.3	10.3	118750.0
5' x 5' excavation at structure	26	25 x 25	0.4	0.2	2496.0
Pull / feed location for fiber cable-Install riser conduit	10	40 x 60	0.6	0.6	0.0
Splice location fiber cable	8	40 x 40	0.3	0.3	0.0
Access structure(rack/tag)	26	20 x 20	0.2	0.2	0.0
Bore / Feed / Pit	0	25 x 25	0.0	0.0	0.0
Lay down area for material & equipment	2	150 x 150	1.0	1.0	0.0
TOTAL			12.8	12.6	121246.0

Notes:
1. Trench 18' wide x 36" deep-Area of 2-5" & 1" sand bed=57"-Area of slurry based amount. To Be Determined (TBD)
2. Width of calculated area based on use of back hoe, cement slurry truck, personnel, and soil spoils
3. The disturbed acreage calculation are estimates based on preferred area of use from the described project feature.

3.2.4.1 Telecommunications equipment installation

Primm Substation Communication Room:

A dedicated communications room would be included within the larger Primm Substation MEER to house the communication equipment. The communication room would be equipped with AC power, batteries and a battery charger, an overhead cable tray, redundant air conditioners, and diverse fiber entry conduits for connection to outside plant fiber optic cables. Fiber terminating shelves, fiber optic transport terminals, channel equipment, communications alarm/switch equipment, and a DC power system would be installed for the communication room. Approximately 60 feet height steel pole would be installed near communication room for temporary microwave path connection to nearby SCE Primm Microwave Communication Site for temporary communication connection to Primm Substation.

Eldorado Substation:

Channel equipment and fiber optic transmission equipment would be installed in the communication room for protection and control circuitry.

Ivanpah Substation:

A microwave antenna would be installed on the existing microwave tower at Ivanpah Substation to provide a communication path between Primm Substation and Ivanpah Substation. Radio Frequency cables would be installed from the microwave antenna on the existing tower to the new microwave equipment in the Ivanpah Communication Room. Channel equipment, microwave transmission equipment, and fiber optic transmission equipment would be installed for protection and control circuitry.
All work will take place within the Ivanpah Substation perimeter fence.

Lugo Substation:

Additional equipment will be installed in the existing telecommunication racks to configure communication circuits at Lugo Substation.

Primm Microwave Communication Site

A microwave communication site would be located on or near the SSSP development site, and would need to be constructed to provide the required diverse communication paths for the Primm Project. The communication site would be approximately 125’ x 125’. During construction, an overall disturbance area of approximately 150’ x 150’ would be required to include the tower/equipment staging area, construction vehicle parking/access area, and delivery vehicle turning area. Area of disturbance associated with the Primm Microwave Communication Site is included in the Supplemental Draft EIS solar field and ancillary facilities section of the acreage disturbance table. The final location and area of the access road to the microwave site would depend on ROW access to the site and separation distance requirements from the existing LADWP Marketplace-Adelanto 500 kV Transmission Line. The communication site would consist of a communication room, microwave tower, generator/fuel tanks, and a fiber optic cable entry facility. Diversely routed underground fiber optic cables would be terminated in the communication room for connection to Primm Substation. Power service to the microwave site would be provided by the local utility service provider, NV Energy. NV Energy would require right of way access to the site to provide the service. SCE would work with NV Energy to define required distribution facilities. Microwave equipment, fiber terminating shelves, fiber optic transport terminals, channel equipment, communications alarm/switch equipment, and a DC power system would be installed in the communication room.

3.2.4.2 Microwave Installation

Installation of Primm Microwave Communication Site:
An approximate 125’ x 125’ area would be required for constructing the new Primm Microwave Communication Site. During construction, an overall disturbance area of 150’ x 150’ would be required to include the tower/equipment staging area, construction vehicle parking/access area, and delivery vehicle turning area.

Chain link fencing would be installed around the communication site perimeter. A concrete barrier wall would be constructed on three sides of the perimeter fencing to prevent flooding, as required. A typical communication site consists of a communication building, microwave tower, an emergency generator, and an above ground 499 gallon capacity propane fuel tank. A typical communication building would either be 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’ x 12’; 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. The final dimension of the communication building would be determined during detailed engineering.

Microwave equipment, DC power equipment, and other telecommunication equipment would be installed in the communication room. A separate concrete pad with a 10 feet 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 35’ x 35’. The tower height would be approximately 185 feet. For the Primm Project, the tower would be built outside the communication room. Concrete footings would be installed to support the tower. Heavy equipment needed for construction would include ready-mixed concrete trucks for the foundation/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 would be on site at any given time for tower construction and antenna installation. Construction of the new communication site would consist of the following steps:

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

All tower, antenna and waveguide material would be delivered by truck and would be staged within a lay down area at the site. The foundation process would start with drilling the holes in the ground using an excavator with the appropriate diameter auger. The spoils produced from drilling would be used on-site or discarded at an off-site disposal facility in accordance with all applicable laws and regulations. Following excavation for the foundation, reinforcing steel, and anchor bolts would be installed in the hole and the concrete would then be placed. Once the concrete is sufficiently cured crews would commence erection of the tower. Sections of the tower would be assembled on the ground and lifted into place by means of a crane. If the tower is to be built higher than the crane can reach, then a gin-pole would be used. Once the tower is complete, antenna and waveguide would be installed on the tower using a crane or gin-pole as appropriate.

3.2.4.3 Road Access for Telecommunications Installation

At the intersection of the existing dirt road and the new access road northeast of Bighorn Switchyard, delivery vehicles will need to make a 90 degree turn towards the Microwave Communication Site. At this intersection, a 50' turning radius will be required for the delivery of the prefabricated shelter. The prefabricated shelter will be delivered on an approximately 70' long truck/ trailer. A triangular shaped area (65' base x 65' high and approximately 2,112 sq feet) on the southwest corner of the intersection would be disturbed to accommodate for the new 50' turning radius

3.2.4.4 Telecommunication System Land Disturbance

Table 3.2-I Telecommunication System Microwave Communication Site Approximate Land Disturbance

Project Feature	Site Quantity	Approximate Disturbed Acreage Calculation (L x W)	Approximate Acres Disturbed During Construction
Microwave site	1	150' x 150'	0.5165
Delivery truck/trailer road off track area at dirt road, access road 90 degree turn to microwave site	1	65' x 65' /2	0.0485

Note: Area of disturbance associated with the Microwave Communication Site is included in the Supplemental Draft EIS solar field and ancillary facilities section of the acreage disturbance table.

3.2.4.5 Telecommunication System Workforce and Construction Equipment Table

Table 3.2-I Telecommunication System Construction Equipment and Workforce Estimates

Work Activity	Estimated Horse power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Schedule (days)	Duration of Use (Hrs/ Day)	Estimated Production per day

MW site tower/shelter installation				**8**	**80**		**N/A**
1 Ton Crew Cab 4X4	200	Diesel	1		15	4	
Crane	500	Diesel	1		9	4	
Flat Bed Truck	300	Diesel	1		3	2	
Drill Rig	500	Diesel	1		7	6	
Dump Truck	250	Diesel	1		7	6	
2 Ton Truck	300	Diesel	1		15	4	
Concrete Truck	300	Diesel	1		2	6	
Concrete Pump	350	Diesel	1		2	6	
Fork lift	200	Diesel	1		10	4	
Backhoe/front loader	350	Diesel	1		10	6	

Note: Up to approximately 50 loads of concrete truck runs would be required during Microwave site foundation construction

3.2.5 Distribution Construction

Distribution facilities would be provided by NV Energy. NV Energy would use standard practice and specifications as defined by NV Energy to install electric services for SCE's Primm Substation site and the SCE Primm Microwave Communication site. NV Energy would also provide temporary power for construction of these sites as required.

3.3 Land Use Rights

SCE would acquire property rights to support the project as required. The Primm Substation would be constructed on land granted by the BLM. The transmission loop-in, telecommunications, distribution and substation access would be constructed on right-of-way granted by the BLM.

3.4 Land Disturbance

Land disturbance would include all areas affected by construction of the Proposed Project. It is estimated that the total permanent land disturbance for the Proposed Project would be 10 acres. It is estimated that the Proposed Project would temporarily disturb 32 acres. The estimated amount of land disturbance for each project component is summarized in Table 3.4-A: Land Disturbance Summary Table.

3.4.1 Land Disturbance Summary Table

Table 3.4-A Primm Project Approximate Land Disturbance Summary

Project Element	Acres Disturbed During Construction	Acres Temporarily Disturbed	Acres Restored *	Acres Permanently Disturbed
Substation and access	7	0	0	7

driveways				
Staging Yards	13	13	13	0
Transmission Line	8	6	6	2
Distribution (See note 1)				
Telecommunications	14	13	13	1

*If known at time of filing
Note: The total land disturbance contributed by distribution components external to the Primm Substation and Primm Microwave sites would be provided by the local electrical distribution service provider, NV Energy.

3.5 Post-Construction Activities

SCE would cleanup areas that would be temporarily disturbed by construction of the Primm Project (which may include the material staging yard, construction setup areas, pull and tension sites, and splicing sites) to as close to pre-construction conditions as feasible, or to the conditions agreed upon between the landowner and SCE following the completion of construction of the Primm Project.

Any damage to existing roads as a result of construction would be repaired, to the extent possible, once construction is completed in accordance with local agency requirements. Following completion of construction activities, SCE would also restore areas that were temporarily disturbed by construction of Primm Project to as close to preconstruction conditions as possible, or where applicable, to the conditions agreed upon between the landowner and SCE. In addition, construction materials and debris would be removed from the area and recycled or properly disposed of off-site. SCE would conduct a final inspection to ensure that cleanup activities were successfully completed.

3.6 Hazardous Materials

Construction of the Proposed Project would require the limited use of hazardous materials, such as fuels, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations. Material Safety Data Sheets would be made available at the construction site for all crew workers.

Phase I Environmental Site Assessment (ESA) evaluation would be completed for the Proposed Project substation site. Phase I ESAs are conducted in accordance with ASTM International (ASTM) Practice E 1527-05 and 40 CFR Part 312 covering AAI. Phase I ESAs include comprehensive and detailed record review, which include site reconnaissance but exclude any intrusive sampling activities.

Project areas would additionally be examined for obvious signs of chemical contamination, such as oil slicks and petroleum odors.

3.7 Reusable, Recyclable, and Waste Material Management

Construction of the Proposed Project would result in the generation of various waste materials, including wood, metal, soil, vegetation, and sanitation waste (portable toilets). Sanitation waste (i.e., human generated waste) would be disposed of in accordance with sanitation waste management practices. Material from existing infrastructure that would be removed as part of the Proposed Project such as conductor, steel, concrete, and debris, would be temporarily stored in the staging yard as the material awaits salvage, recycling, or disposal.

Material excavated for the Proposed Project would either be used as fill, backfill for new LSTs installed for the project, made available for use by the landowner, or disposed of off-site at an appropriately licensed waste facility. If contaminated material is encountered during excavation, work would stop at that location and SCE's Spill Response Coordinator would be called to the site to make an assessment and notify the proper authorities.

3.8 Geotechnical Studies

SCE conducted geotechnical studies for the Eldorado-Ivanpah 220 kV Transmission Project, and has reviewed the Geotechnical Investigation Report prepared for the Eldorado-Ivanpah 220 kV Transmission Project as a preliminary geotechnical evaluation for the Primm Project. Further geotechnical site assessment and field investigation would be conducted at The Primm Substation site, microwave telecommunications site, and the transmission line segments (structures and access roads) prior to the start of construction. The geotechnical studies would include evaluation of depth to the water table, liquefaction potential, physical properties of subsurface soils, soil resistivity, and the presence of hazardous materials and common contaminants. The information obtained would be used to provide site grading and design recommendations for the project.

3.9 Worker Environmental Awareness Training

Prior to construction, a Worker Environmental Awareness Program (WEAP) would be developed. A presentation would be prepared by SCE and used to train all site personnel prior to the commencement of work. A record of all trained personnel would be kept.

In addition to instruction on compliance with any additional applicant proposed measures and project mitigation measures developed after the pre-construction surveys, all construction personnel would also receive the following:

- A list of phone numbers of SCE environmental specialist personnel associated with the Primm Project (archaeologist, biologist, environmental compliance coordinator, and regional spill response coordinator)
- Instruction on the Clark County Department of air Quality fugitive dust rules/Dust Control Permit requirements

- A review of applicable local, state and federal ordinances, laws and regulations pertaining to historic preservation, a discussion of disciplinary and other actions that could be taken against persons violating historic preservation laws and SCE policies, a review of archaeology, history, prehistory and Native American cultures associated with historical resources in the project vicinity inclusive of instruction on what typical cultural resources look like, and instruction that if discovered during construction, work is to be suspended in the vicinity of any find and the site foreman and archaeologist or environmental compliance coordinator is to be contacted for further direction
- Instruction on the importance of maintaining the construction site inclusive of ensuring all food scraps, wrappers, food containers, cans, bottles, and other trash from the Project area would be deposited in closed trash containers. Trash containers would be removed from the Project as required and would not be permitted to overfill
- Instruction on the individual responsibilities under the Clean Water Act, the project SWPPP, site-specific BMPs, and the location of Material Safety Data Sheets for the project
- Instructions to notify the foreman and regional spill response coordinator in case of a hazardous materials spill or leak from equipment, or upon the discovery of soil or groundwater contamination
- A copy of the truck routes to be used for material delivery
- Instruction that noncompliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the Primm Project

3.10 Construction Equipment and Personnel

The estimated elements, materials, and number of personnel and equipment required for construction of the Primm Project are summarized for each project component in their respective Construction Equipment and Workforce Estimates Table detailed in above sections.

Construction would be performed by either SCE construction crews or contractors. If SCE construction crews are used they typically would be based at SCE's local facilities, (e.g., service centers, substation, transmission ROW, etc.) or a temporary material staging yard set up for the project. Contractor construction personnel would be managed by SCE construction management personnel and based out of the contractor's existing yard or temporary material staging yard set up for the project. SCE anticipates that crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, and construction scheduling.

In general, construction efforts would occur in accordance with accepted construction industry standards. To the extent possible, SCE would comply with local ordinances for construction activity. Should the need arise to work outside the local ordinances, SCE would request a variance from the local jurisdictions. For example, it may be necessary to work during nighttime or outside normal work hours when loads on the lines are reduced.

3.11 Construction Schedule

Construction would commence following CPUC exemption, and requires PUCN approval BLM approval, final engineering, procurement activities, and receipt of all applicable permits.

3.12 Project Operation (and Maintenance)

Ongoing operation and maintenance activities are necessary to ensure reliable service, as well as the safety of the utility worker and the general public, as mandated by the CPUC. SCE facilities are subject to Federal Energy Regulatory Commission jurisdiction. SCE transmission facilities are under operational control of the California Independent System Operator.

Primm Substation would be unstaffed and would function as a remotely controlled substation. The Grid Control Center (GCC), Alternate Grid Control Center (AGCC) and all Switching Centers are equipped with Energy Management System (EMS) workstations allowing them to monitor and respond to alarms as the system status changes. All workstation users have the ability to perform supervisory control of remote station equipment within their jurisdictional area.

Remote substations with Supervisory control are equipped with a Programmable Logic Controller (PLC) integrated with Substation Automation System (SAS). All automatic functions and data acquisition is performed by the SAS. When a station is supervisory controlled, controllable points can be initiated from the switching center with operational jurisdiction.

Substation Operators (SO) perform station inspections in unmanned substation when there is an indication of trouble. Routine circuit breaker and disconnect switching operations at remotely controlled stations would normally be performed by remote control on orders by the responsible switching center. The System Operators are responsible for maintaining the correct status of all lines and equipment under their jurisdiction.

The transmission lines would be maintained in a manner consistent with CPUC General Order 95 and General Order 128 as applicable, and the National Electrical Safety Code (NESC) for those circuits that are located outside of California. Normal operation of the lines would be controlled remotely through SCE control systems, and manually in the field as required. SCE inspects the transmission overhead facilities in a manner consistent with CPUC General Order 165 a minimum of once per year via ground and/or aerial observation, but usually occurs more frequently based on system reliability. Maintenance would occur as needed and could include activities such as repairing conductors, washing or replacing insulators, repairing or replacing other hardware components, replacing structures, tree trimming, brush and weed control, and access road maintenance. Most routine O&M activities of overhead facilities are performed from existing access roads. Repairs done to existing facilities, such as repairing or replacing existing structures, could occur in undisturbed areas. Existing conductors could require re-stringing to repair damages. Some pulling site locations could be in previously undisturbed areas and at times, conductors could be passed through existing vegetation on route to their destination.

Routine access road maintenance is conducted on an annual and/or as-needed basis. Road maintenance includes maintaining a vegetation-free corridor (to facilitate access and for fire prevention) and blading to smooth over washouts, eroded areas, and washboard surfaces as needed. Access road maintenance could include brushing (i.e., trimming or removal of shrubs) approximately 2-5 feet beyond berms or road's edge when necessary to keep vegetation from intruding into the roadway. Road maintenance would also include cleaning ditches, moving and establishing berms, clearing and making functional drain inlets to culverts, culvert repair, clearing and establishing water bars, and cleaning and repairing over-side drains. Access road maintenance includes the repair, replacement and installation of storm water diversion devices on an as-needed basis.

Insulators could require periodic washing with water to prevent the buildup of contaminants (dust, salts, droppings, smog, condensation, etc.) and reduce the possibility of electrical arcing which can result in circuit outages and potential fire. Frequency of insulator washing is region specific and based on local conditions and build-up of contaminants. Replacement of insulators, hardware, and other components is performed as needed to maintain circuit reliability.

Some structure locations and/or lay down areas could be in previously undisturbed areas and could result in ground and/or vegetation disturbance, though attempts would be made to utilize previously disturbed areas to the greatest extent possible. In some cases new access is created to remove and replace an existing structure.
Existing conductors could require re-stringing to repair damages. Some pulling site locations could be in previously undisturbed areas and at times, conductors could be passed through existing vegetation on route to their destination.

In addition to regular O&M activities, SCE conducts a wide variety of emergency repairs in response to emergency situations such as damage resulting from high winds, storms, fires, and other natural disasters, and accidents. Such repairs could include replacement of downed structures, or lines or re-stringing conductors. Emergency repairs could be needed at any time. SCE would notify the BLM as soon as feasible of any emergency repairs. The notice would include a description of the work, location of the transmission facilities, and cause of the emergency, if known. The BLM and SCE would work together to agree upon habitat restoration needs after the emergency.

The Telecommunications Equipment would be subject to maintenance and repair activities on an as needed or emergency basis. Activities would include replacing defective circuit boards, damaged radio antennas or feedlines and testing the equipment. Telecommunication Equipment would also be subject to routine inspection and preventative maintenance such as filter change-outs or software and hardware upgrades. Most regular O&M activities of Telecommunications Equipment are performed at Substation or Communication Sites and inside the equipment rooms and are accessed from existing access roads with no surface disturbance; helicopter transportation may be required to access remote Communications Sites for routine or emergency maintenance activities. Access road maintenance is performed as mentioned in the Project Operations Transmission and Subtransmission section above.

The Telecommunications Cables would be maintained on an as needed or emergency basis. Maintenance activities would include patrolling, testing, repairing and replacing damaged cable and hardware. Most regular maintenance activities of overhead facilities are performed from existing access roads with no surface disturbance. Repairs done to existing facilities, such as repairing or replacing existing cables and re-stringing cables, could occur in undisturbed areas. Access and habitat restoration, as mentioned in the Project Operations Transmission and Subtransmission section above may be required for routine or emergency maintenance activities.

3.13 Decommissioning

Prior to removal or abandonment of the facilities that would be permitted to be constructed within a reasonable time following termination of the BLM ROW Grant, SCE would prepare a removal and restoration plan. The removal and restoration plan would address removal of SCE's facilities from the permitted area, and any requirements for habitat restoration and re-vegetation, the removal and restoration plan would then be approved by the permitting agency before implementation.