3. Project Description

SCE proposes to construct the Proposed Project in Kern County, with 115 kV subtransmission lines and fiber optic telecommunication cable extending through San Bernardino County. The Proposed Project would consist of the following major components:

- Upgrading and expanding the existing Downs 33/12 kV Substation to a 115/12 kV substation containing a 33 kV switchrack.
- Routing an existing 115 kV subtransmission line into and out of the proposed substation.
- Installing a fiber optic telecommunication system to provide communication circuits for the protection, monitoring, and control of 115 kV subtransmission lines and substation equipment.

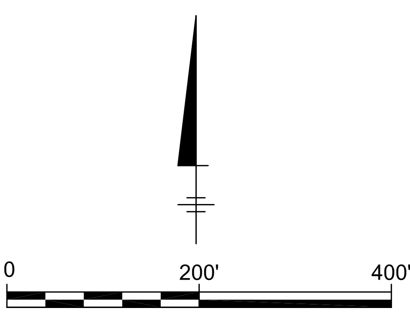
The Proposed Project components listed above are described in more detail below. The project description is based on planning level assumptions. Exact details would be determined following completion of final engineering, identification of field conditions, availability of labor, materials and equipment, and compliance with applicable environmental and permitting requirements.

3.1 Proposed Project Components

3.1.1 Downs Substation Description

The improvements at Downs Substation would include the addition of a new 115/12 kV unattended, automated 56 MVA low-profile substation (with a 28 MVA N-1 reserve bank). The proposed Downs Substation capacity would have the potential to expand to 112 MVA as necessary. The existing Downs Substation encompasses approximately one acre of land within the City of Ridgecrest. The proposed expansion of Downs Substation would require an additional 2.5 acres of a 4.6-acre parcel of SCE-owned land adjacent to the existing Downs Substation (see Figures 3.1-1 and 3.1-2). Components of Downs Substation improvements are provided below; the switchracks, transformers, capacitor banks, Mechanical and Electrical Equipment Room (MEER), and substation access are shown on Figure 3.1-3.

MAP SOURCE: Google Earth Pro™ 2009, 35°37'18.17"N, 117°41'20.75"W



SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

EXISTING DOWNS SUBSTATION AREA

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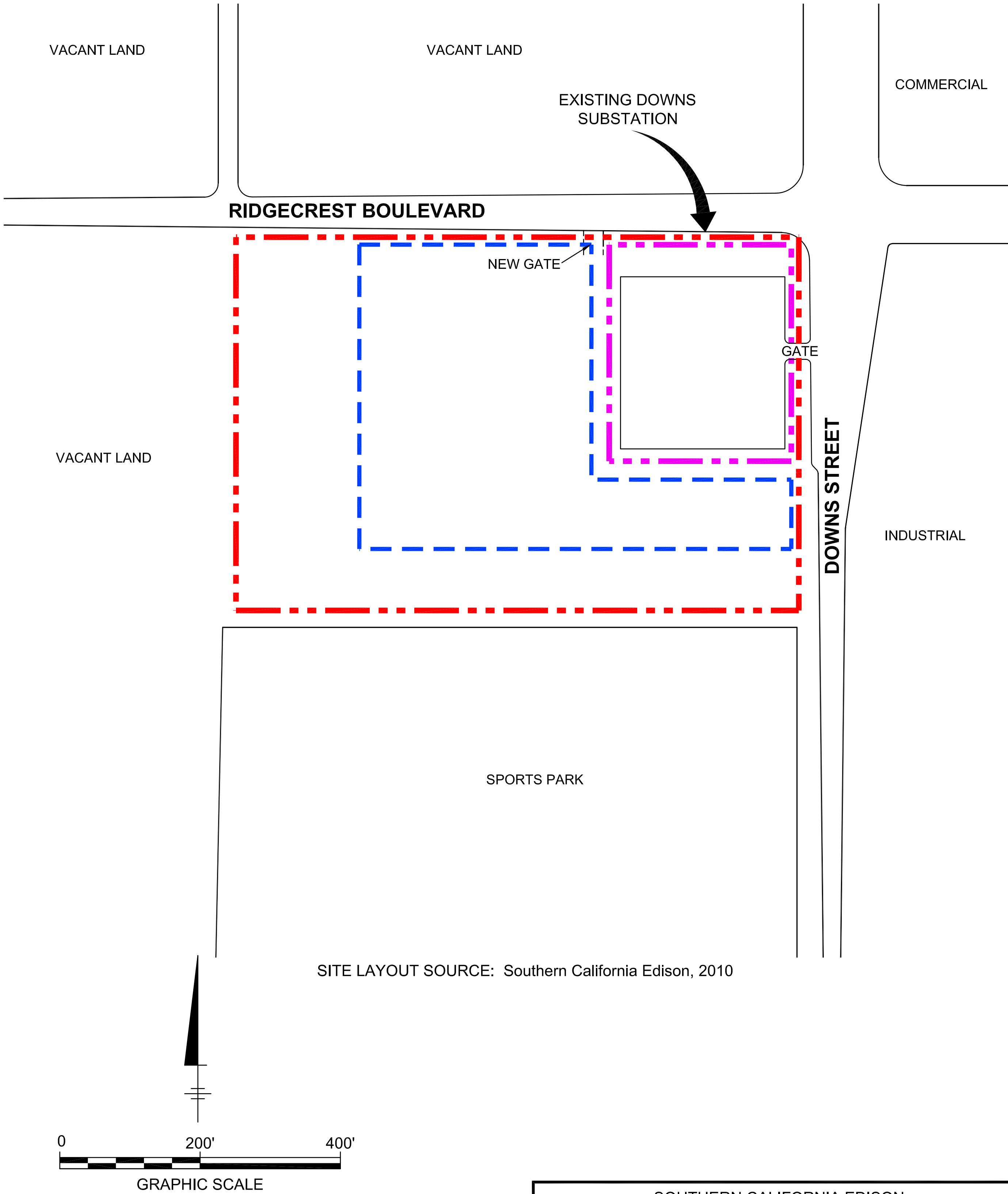
FIGURE
3.1-1



LEGEND

PROPOSED SUBSTATION EXPANSION AREA

EXISTING SUBSTATION AREA

DOWNS SUBSTATION PROJECT AREA/
SCE-OWNED PROPERTY

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DOWNS SUBSTATION AREA

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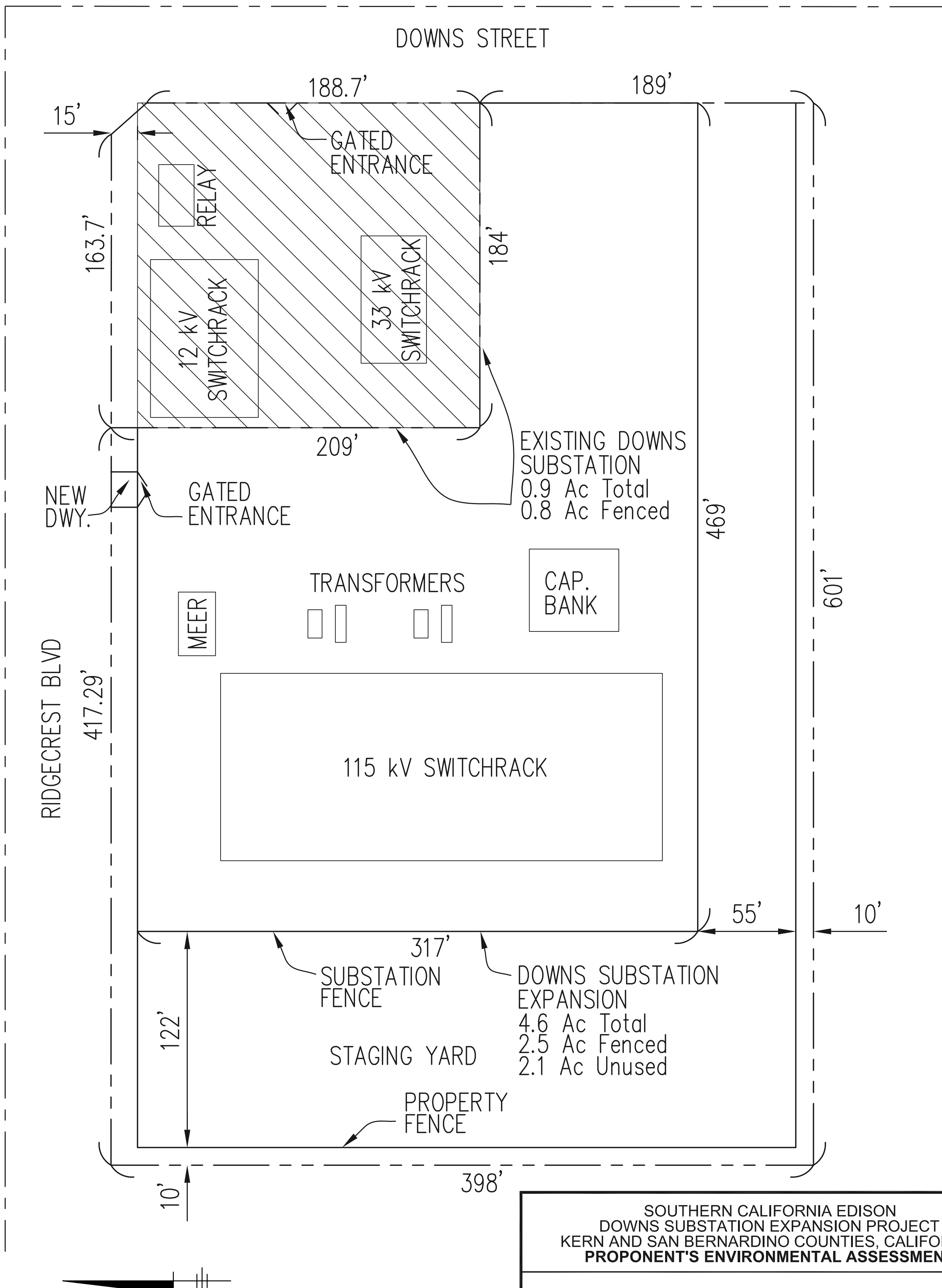
FIGURE
3.1-2



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DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED DOWNS SUBSTATION LAYOUT

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FIGURE
3.1-3

115 kV Switchrack

The proposed 115 kV low-profile steel switchrack would be up to 35 feet high, 106 feet wide, and 250 feet long. The 115 kV switchrack would consist of eight 30-foot-wide positions: one switchrack position would be used for the Downs-McGen-Searles 115 kV subtransmission line, a second switchrack position would be used for the Downs-Inyokern 115 kV subtransmission line, two switchrack positions would be used for the 115/12 kV transformer banks (Bank No. 1 and Bank No. 2), an additional switchrack position would be used for the 115 kV bus tie position, and three switchrack positions would be reserved as vacant positions for future expansion of the substation.

The operating and transfer buses would each be 240 feet long and consist of two 1590 thousand circular mils (kcmil) Aluminum Conductor Steel Reinforced (ACSR) for each of the three electrical phases.

The two 115 kV subtransmission line positions and the two 115 kV transformer bank positions would each be equipped with a circuit breaker and three group-operated disconnect switches. The 115 kV bus tie position would be equipped with a circuit breaker and two group-operated disconnect switches.

115/12 kV Transformers

Three 28 MVA, 115/12 kV transformers would be installed, each equipped with group-operated isolating disconnect switches on the high voltage and low voltage sides, surge arresters, and neutral current transformers. The transformer structures would occupy an area approximately 74 feet long and 120 feet wide. The transformer equipment would be approximately 34 feet in height. Two 12 kV underground power circuits would connect the transformers to the existing 12 kV switchrack positions 5A and 11A via power cable trench.

33/12 kV Transformers

Remove the existing two 33/12 kV, 22.4 MVA transformers and one spare 33/12 kV, 14 MVA transformer.

12 kV Switchrack

The existing 12 kV operating and transfer buses would be extended one position. Two 12 kV bank positions in the 12 kV switchrack would be equipped with 3,500 ampere rated circuit breakers and disconnect switches.

12 kV Capacitor Banks

A total of two 12 kV 4.8 megavolt-amperes reactive (MVAR) capacitor banks would be installed within Downs Substation. Each of these capacitor banks would be approximately 15 feet high, 17 feet long, and 13 feet wide.

Substation Control Power

The existing 48 volt direct current (VDC) control power would be upgraded to 125 VDC control power at the existing 33/12 kV Downs Substation. In addition, the 125 VDC control power would be integrated into the proposed 115 kV Downs Substation expansion. The work would require the removal of the existing three 33 kV circuit breakers and ten 12 kV circuit breakers; two 33 kV line relays and ten 12 kV line relays; and one 33 kV bus relay and one 12 kV vacuum switch. In addition, the above relays would be replaced with three 33 kV circuit breakers and ten 12 kV circuit breakers; two 33 kV line relays and ten 12 kV line relays located in the proposed Downs Substation MEER; and one 33 kV bus relay and one 12 kV vacuum switch.

Mechanical and Electrical Equipment Room (MEER)

A MEER is a prefabricated structure that is typically made of galvanized steel. The MEER typically has a grey or beige color roof and side walls. The roofline, wall joints, and doorway may have brown trim. A MEER would be erected and equipped with two heating, ventilation, air conditioning (HVAC) units, a temperature and humidity sensor, a direct current (DC) paralleling box and distribution panel, single-phase alternating current (AC) and DC distribution panels, two telecommunication racks and equipment, a battery charger and associated batteries, Station Automation 2 System (SA-2) Human Machine Interface/Programmable Logic Controller (HMI/PLC), and a telephone. Control cable trenches would be installed to connect the MEER to various pieces of equipment within the 115 kV and the 12 kV switchracks. An alarm system would be installed to alert SCE personnel when an unauthorized entry into the MEER is detected. Underground conduit would be used to connect the MEER to outside fiber optic telecommunication cable splice locations. Telecommunication equipment would be installed in equipment racks located in the MEER. Fiber optic telecommunication cable would attach to the telecommunication equipment, exit the Downs Substation MEER, and splice to an existing fiber optic telecommunication cable located outside of the Downs Substation expansion property. The MEER dimensions would be approximately 11 feet tall, 36 feet long, and 15 feet wide.

Restroom Facility

If water and sewer connections are available, Downs Substation would be equipped with a permanent restroom facility. The approximate dimensions of the restroom facility would be 10 feet high, 14 feet long, and 14 feet wide. If water and sewer connections are not available and there is no public restroom or another SCE facility within 1.5 miles, then a portable chemical restroom would be located within the Downs Substation perimeter enclosure. The portable restroom would be maintained by a qualified service company.

3.1.1.1 Substation Access

The Downs Substation currently has access from Downs Street. An additional access driveway would be constructed from Ridgecrest Boulevard. The proposed new Downs Substation entrance would have a 24-foot wide asphalt cement paved driveway that would extend approximately 55 feet from Ridgecrest Boulevard to the Downs Substation entry gate. The automated entry gate would be approximately 8 feet high and 24 feet wide. In addition to the entry gate, a 4-foot-wide personnel gate would be installed within the proposed Downs Substation fence for personnel access into the substation. SCE would secure all necessary permits required by the City of Ridgecrest for the construction of the driveway.

3.1.1.2 Substation Drainage

Presently, the real property where the proposed Downs Substation expansion would occur drains naturally to the east into a topographic low point adjacent to Downs Street. The expanded portion of the Downs Substation would be graded to a slope between 1 and 2 percent and compacted to 90 percent of the maximum dry density; preliminary data indicate that existing compaction ranges from 80 to 85 percent, and therefore 90 percent compaction would not significantly increase runoff. Construction of the proposed Downs Substation would interrupt the existing drainage patterns throughout the location, and would be modified to divert drainage around the proposed Downs Substation to the existing discharge point adjacent to Downs Street along the east side of the property. The construction drainage would be designed to maintain or reduce discharge of stormwater runoff from the location through the use of an engineered detention basin, and would be in compliance with a construction Storm Water Pollution Prevention Plan (SWPPP). SCE would consult with the City of Ridgecrest prior to finalizing the drainage design.

The proposed Downs Substation grading design would incorporate Spill Prevention Control and Countermeasure (SPCC) Plan requirements due to the planned operation of oil-filled transformers at the proposed Downs Substation (in accordance with 40 Code of Federal Regulations [CFR] Part 112.1 through Part 112.7).[15] Typical SPCC features include curbs and berms designed and installed to contain spills should they occur. These features would be part of SCE's final engineering design for the Proposed Project.

The ground surface of the proposed Downs Substation would be finished with materials imported to the location and materials excavated from and used at the location. These materials, and their approximate square footages and volumes, are listed in Table 3.1-1.

Table 3.1-1 Surface Improvement Materials and Volumes

Element		Material	Approximate Surface Area (square feet)	Approximate Volume (cubic yards)
Fill	Gross Net	Soil	50,444	4,470 500
Substation Equipment		Concrete	2,000	180
Cable Trenches		Concrete	1,900	15
115 kV Bus Enclosures				
Internal Driveway		Asphalt Concrete Class II Aggregate Base	5,600 5,600	70 1,054
External Driveway		NA		
Substation	Rock Surfacing	Crushed rock or gravel	199,940	1,850

Notes:
kV = kilovolt
NA = Not applicable

Based on preliminary design, approximately 3,970 cubic yards of soil would be cut from and 4,470 cubic yards of soil would be filled at the proposed Downs Substation expansion area. Approximately 500 cubic yards of soil would need to be imported for fill. In order to construct foundations and footings for the proposed Downs Substation equipment, approximately 180 cubic

15 CFR Title 40 Protection of Environment. Part 112 Oil Pollution Prevention. § 112.1 to § 112.7. See http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr112_main_02.tpl

yards of soil would be excavated from the proposed Downs Substation location. In addition, approximately 15 cubic yards of soil would be excavated for the cable trenches. The excavated soil would be stockpiled at the proposed Downs Substation during excavation. Ultimately, the stockpiled soil would be graded and compacted at the proposed Downs Substation location.

3.1.1.3 Substation Lighting

Lighting at the proposed Downs Substation would consist of high-pressure sodium, low intensity lights located in switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours for emergency and/or scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The lights would be directed downward to reduce glare outside the facility. One light would indicate the operation of the rolling gate; this light would automatically turn on when the gate is opened and turn off when the gate is closed.

3.1.1.4 Substation Perimeter

The proposed Downs Substation would be enclosed on all sides by an eight-foot-high chain-link fence. Five strands of barbed wire would be affixed to the top of the fence. Additionally, the remaining parcel would be enclosed on all sides by an eight-foot-high chain-link fence without barbed wire. Landscaping around the proposed Downs Substation property would be designed to filter views for the surrounding community and other potential sensitive receptors. Landscaping and irrigation would be installed following construction of the proposed Downs Substation fence. Water service from the Indian Wells Valley Water District has been established at the Downs Substation. Prior to the start of construction, SCE would develop an appropriate landscaping plan that would be submitted to the City of Ridgecrest for review and comment.

3.1.1.5 Substation Dimensions

The expanded portion of the Downs Substation would encompass approximately 2.5 acres of a 4.6-acre parcel located within the City of Ridgecrest, as shown on Figure 3.1-2. The dimensions of the enclosed upgraded Downs Substation would be approximately 469 feet by 317 feet. The dimensions of the SCE-owned property would be approximately 601 feet by 398 feet. The property limits of the existing Downs Substation are approximately 209 feet by 184 feet. Figure 3.1-3 provides a layout for the proposed Downs Substation.

3.1.1.6 Upgraded Relay Protection at Inyokern, McGen and Searles Substations

To protect the newly created 115 kV subtransmission lines from abnormal electrical conditions, SCE would install appropriate protective relays within the MEERs of Inyokern Substation, McGen Substation, and Searles Substation. SCE would also install telecommunication equipment to provide communication channels for the protective relay equipment at these substations. All of the work described above would occur within the interior perimeter of these substations. No grading or ground disturbance would occur as a result of this work.

3.1.2 115 kV Subtransmission Line Description

3.1.2.1 Modifications to the Inyokern-McGen-Searles No. 2 115 kV Substransmission Line

The existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line currently runs in a northerly direction along Downs Street to the intersection of Downs Street and Ridgecrest Boulevard, then in a westerly direction along Ridgecrest Boulevard (see Figure 3.1-4). This line would be rerouted by intercepting the existing 115 kV subtransmission line at the southeast and northwest corners of the proposed Downs Substation expansion area and terminating it into Downs Substation to form the Downs-McGen-Searles and Downs-Inyokern 115 kV subtransmission lines. At the intercept points, SCE would construct two new 115 kV subtransmission line segments to connect the proposed Downs-McGen-Searles and the proposed Downs-Inyokern 115 kV subtransmission lines to the proposed Downs Substation (shown in Figure 3.1-4).

To loop the proposed Downs-McGen-Searles 115 kV subtransmission line, SCE would intercept the existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line at the southeast corner of the proposed expanded Downs Substation on Downs Street. Under the initial design, the following poles would be installed to create the new 115 kV subtransmission line: 1) along Downs Street, two wood stub poles, one Light Weight Steel (LWS) pole, and one Tubular Steel Pole (TSP); and 2) on the expanded Downs Substation property, two TSPs and one LWS pole. In addition, along Downs Street, two existing wood poles would be topped, and the 115 kV conductor and related line hardware would be removed. One existing wood pole would be removed along Downs Street (Figure 3.1-4). Finally, a Fault Return Conductor (FRC) would be installed at the getaway[16] TSP located at Downs Substation.

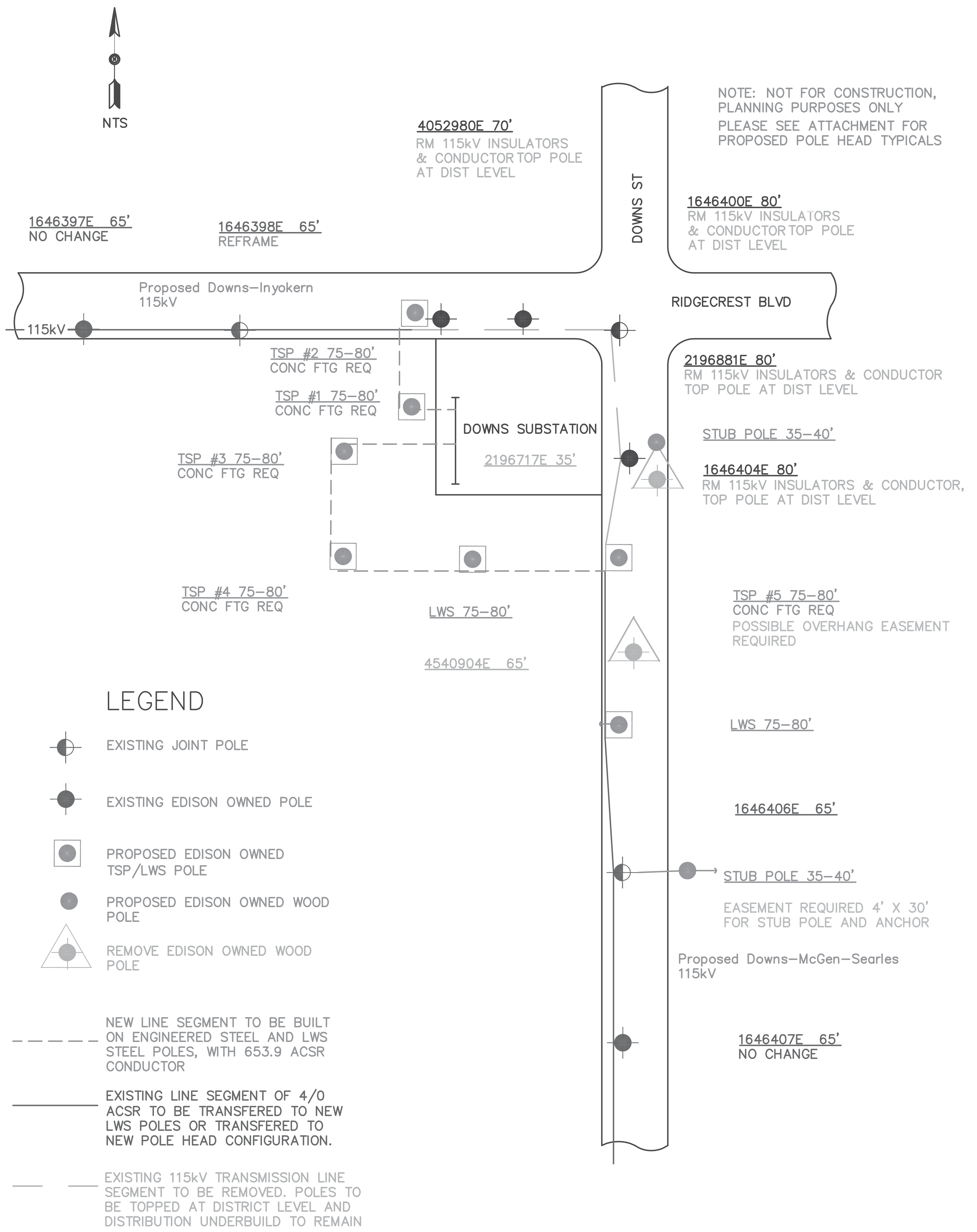
[16] A getaway is the first structure to which a line or cable is routed after the line or cable leaves a substation.

To loop the proposed Downs-Inyokern 115 kV subtransmission line, SCE would intercept the existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line at the northwest corner of proposed Downs Substation expansion on Ridgecrest Boulevard. Under the preliminary design, the following poles would be installed to create the new 115 kV subtransmission line: 1) along Ridgecrest Boulevard, one TSP; and 2) on the expanded Downs Substation property, one TSP. In addition, along Ridgecrest Boulevard, two existing wood poles would be topped, and the 115 kV conductor and related line hardware would be removed. One existing wood pole would be reframed (Figure 3.1-4). Finally, an FRC would be installed at the getaway TSP located at Downs Substation.

The installation of the FRCs would require two trenches to be excavated approximately 30 inches deep, 18 inches wide, and backfilled with native soil. The trench from TSP #3 on the proposed Downs-McGen-Searles 115 kV subtransmission line would be approximately 100 to 150 feet in length, and the trench from TSP #1 on the proposed Downs-Inyokern 115 kV subtransmission line would be approximately 50 to 100 feet in length. The FRC for the proposed Downs-Inyokern 115 kV subtransmission line would be located on TSP #1, and the FRC for the proposed Downs-McGen-Searles 115 kV subtransmission line would be located on TSP #3 (see Figure 3.2-1). Each trench would be constructed at the TSP footings and would be routed and connected to the proposed Downs Substation ground grid. A two-inch diameter conduit would be located within each trench. A 4/0 copper wire would be installed in the conduits to connect the FRCs to the Downs Substation ground grid.

The added segment to the southerly portion of the Inyokern-McGen-Searles No. 2 115 kV subtransmission line, which forms the proposed Downs-McGen-Searles 115 kV subtransmission line, would be approximately 800 circuit feet in length. The added segment to the westerly portion of the Inyokern-McGen-Searles No. 2 115 kV subtransmission line, which forms the proposed Downs-Inyokern 115 kV subtransmission line, would be approximately 200 circuit feet in length. The overall route of the 115 kV subtransmission lines associated with the Proposed Project (existing and proposed) is shown on Figures 3.1-6 and 3.1-7.

PROPOSED DOWNS–INYOKERN 115kV AND DOWNS–McGEN–SEARLES 115kV LINES



SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED SUBTRANSMISSION LINE ROUTE

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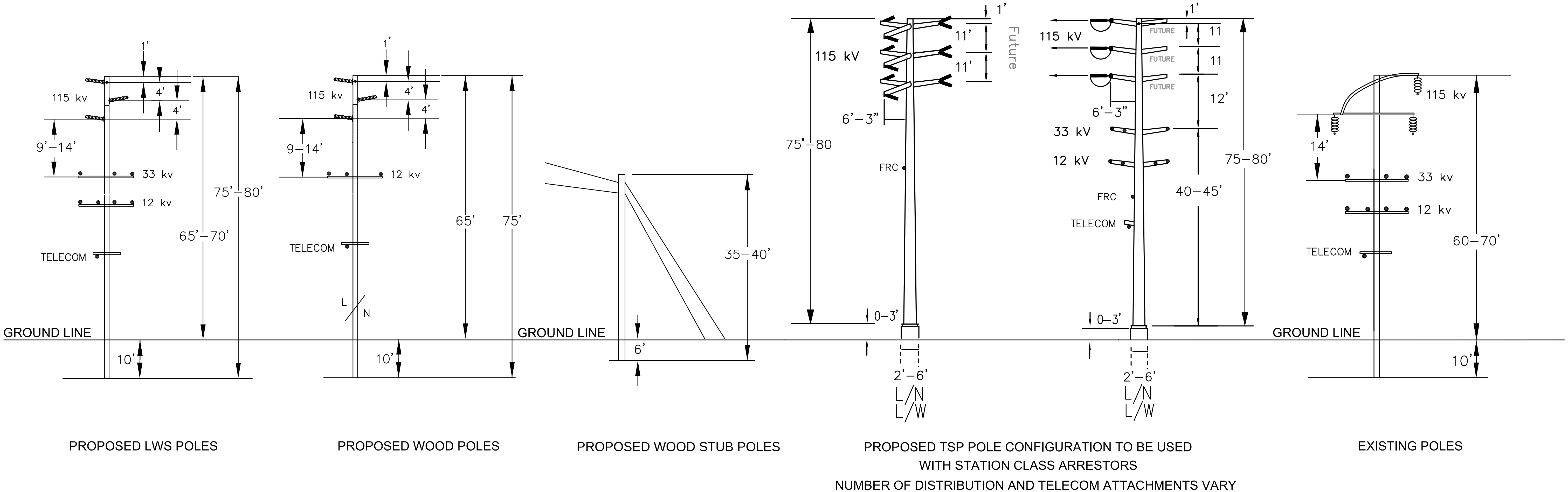
FIGURE
3.1-4



NOTE:

Pole Configurations assume Station Class Arrestors to be used at Downs Substation. Number and elevation of Distribution and Telecom attachments may vary

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SUBTRANSMISSION STRUCTURE DIMENSIONS

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FIGURE
3.1-5

The 115 kV subtransmission line components that would be used to complete the reroute would include wood stub poles, LWS poles and TSPs, 653.9 Aluminum ACSR conductor, insulators, line hardware, guying, and anchors. Based on initial engineering design, the approximate height above ground of the wood stub poles would be no higher than 40 feet, the approximate height above ground of the LWS poles would range between 65 to 70 feet, and the approximate height of the TSPs would range between 75 to 80 feet. See Table 3.2-1 for a comparison of the pole types planned for the Proposed Project.

Table 3.2-1 Typical Subtransmission Structure Dimensions

Pole Type	Approximate Diameter	Approximate Height Above Ground	Approximate Auger Hole Depth	Approximate Auger Diameter
Wood Stub Pole	2 to 3 feet	35 to 40 feet	4 to 6 feet	2 to 4 feet
Wood Pole	2 to 3 feet	60 to 70 feet	8 to 10 feet	2 to 4 feet
Light Weight Steel Pole	2 to 3 feet	65 to 70 feet	8 to 10 feet	2 to 4 feet
Tubular Steel Pole	2 to 4 feet	75 to 80 feet	Not Applicable	Not Applicable
Tubular Steel Pole Concrete Foundation	2 to 6 feet	0 to 3 feet	20 to 30 feet	2 to 6 feet

Approximate dimensions of the LWS subtransmission poles and TSPs are shown in Figure 3.1-5. The 115 kV subtransmission poles would be designed consistent with the Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 2006. [17]

TSPs utilized for the Proposed Project would be approximately 2 to 4 feet in diameter and extend 75 feet to 80 feet above grade. The TSPs would be attached to the concrete foundations that extend underground approximately 20 to 30 feet, with approximately 0 to 3 feet of concrete visible above grade. In some instances, some TSPs may be installed in direct-buried concrete. TSPs are typically used:

- Where location limitations or restrictions prohibit guy and anchor installation;

[17] Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 published by the Edison Electric Institute and the Avian Power Line Interaction Committee in collaboration with the Raptor Research Foundation. This document can be found at: http://www.aplic.org/suggestedpractices2006(LR),pdf.

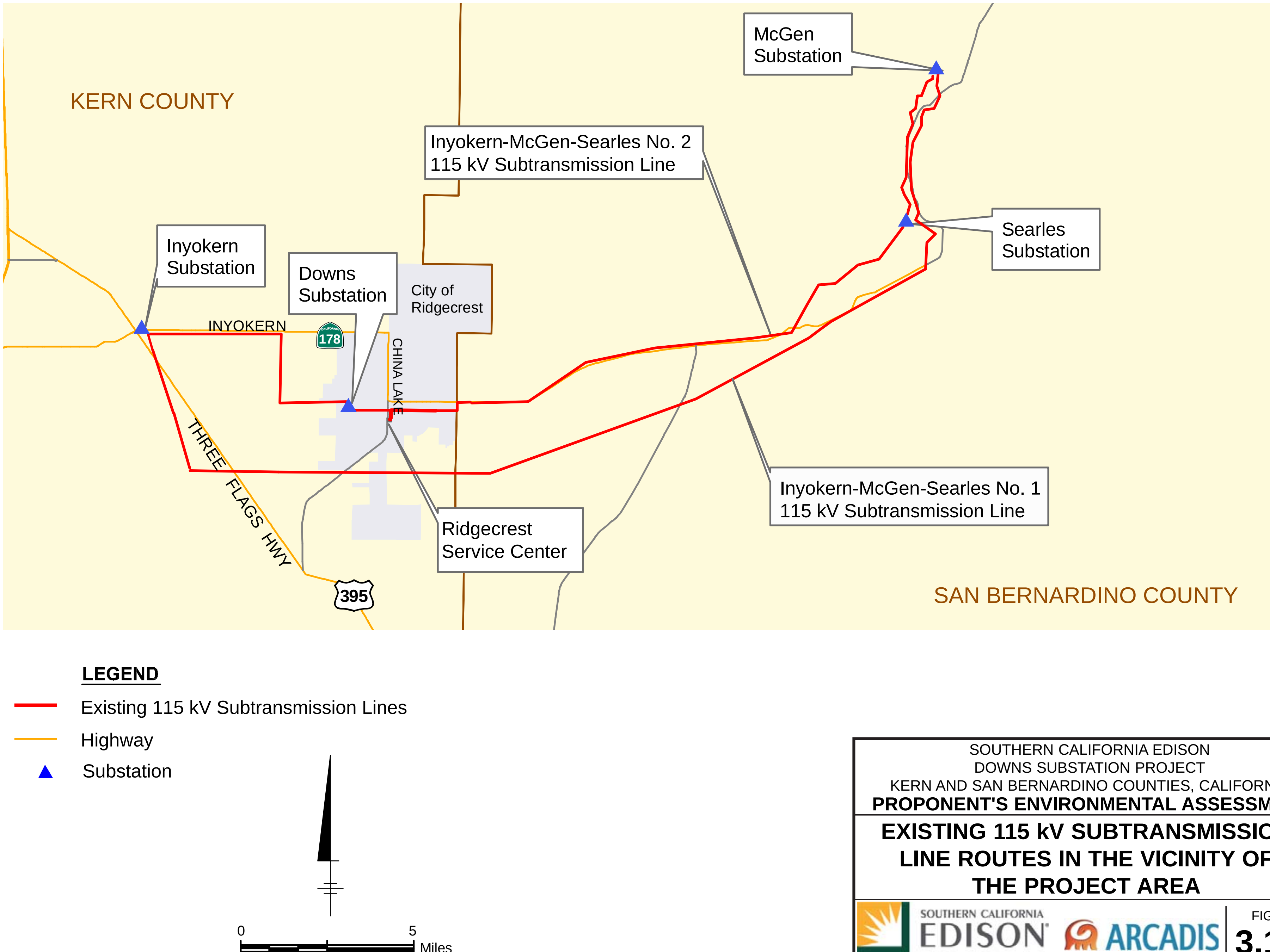
- Where strength or height of a wood or LWS pole is exceeded;
- Where TSPs are a condition of the easement; or
- Where the location is subject to extreme or severe environmental conditions such as damage from fire, birds, insects, or weather.

LWS poles utilized for the Proposed Project would be direct buried to a depth of approximately 8 to 10 feet below grade and extend approximately 65 to 70 feet above grade. The diameter of LWS poles would be approximately 2 to 3 feet.

It is anticipated that the 115 kV subtransmission structures would be installed within the franchise right-of-way of Downs Street and Ridgecrest Boulevard. Acquisition of new right-of-way or easement rights, however, may be required in order to install the wood stub pole and the associated guying. Access to the new 115 kV subtransmission facilities would be from the existing public streets.

3.1.2.2 Modifications to the Existing Inyokern-McGen-Searles No. 1 115 kV Subtransmission Line

SCE would need to replace approximately six existing Inyokern-McGen-Searles No. 1 115 kV subtransmission line wood poles as required to support the new fiber optic telecommunications facilities where the existing wood poles do not meet CPUC G.O. 95 wind loading requirements and/or SCE design standards. The existing wood poles range between 58 to 70 feet above grade. SCE would replace the existing wood poles with approximately six new wood poles of various head configurations that range between 65 to 70 feet above grade on the existing Inyokern-McGen-Searles No. 1 115 kV subtransmission line. The diameter of the wood poles would be approximately 2 to 3 feet and direct-buried to a depth of approximately 8 to 10 feet below grade. See Figure 3.1-5 for an illustration of wood pole structures; wood pole dimensions are also included in Table 3.2-1. The construction methodology is further described below in Section 3.2.4, Fiber Optic Telecommunication System Construction.



SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

EXISTING 115 kV SUBTRANSMISSION LINE ROUTES IN THE VICINITY OF THE PROJECT AREA

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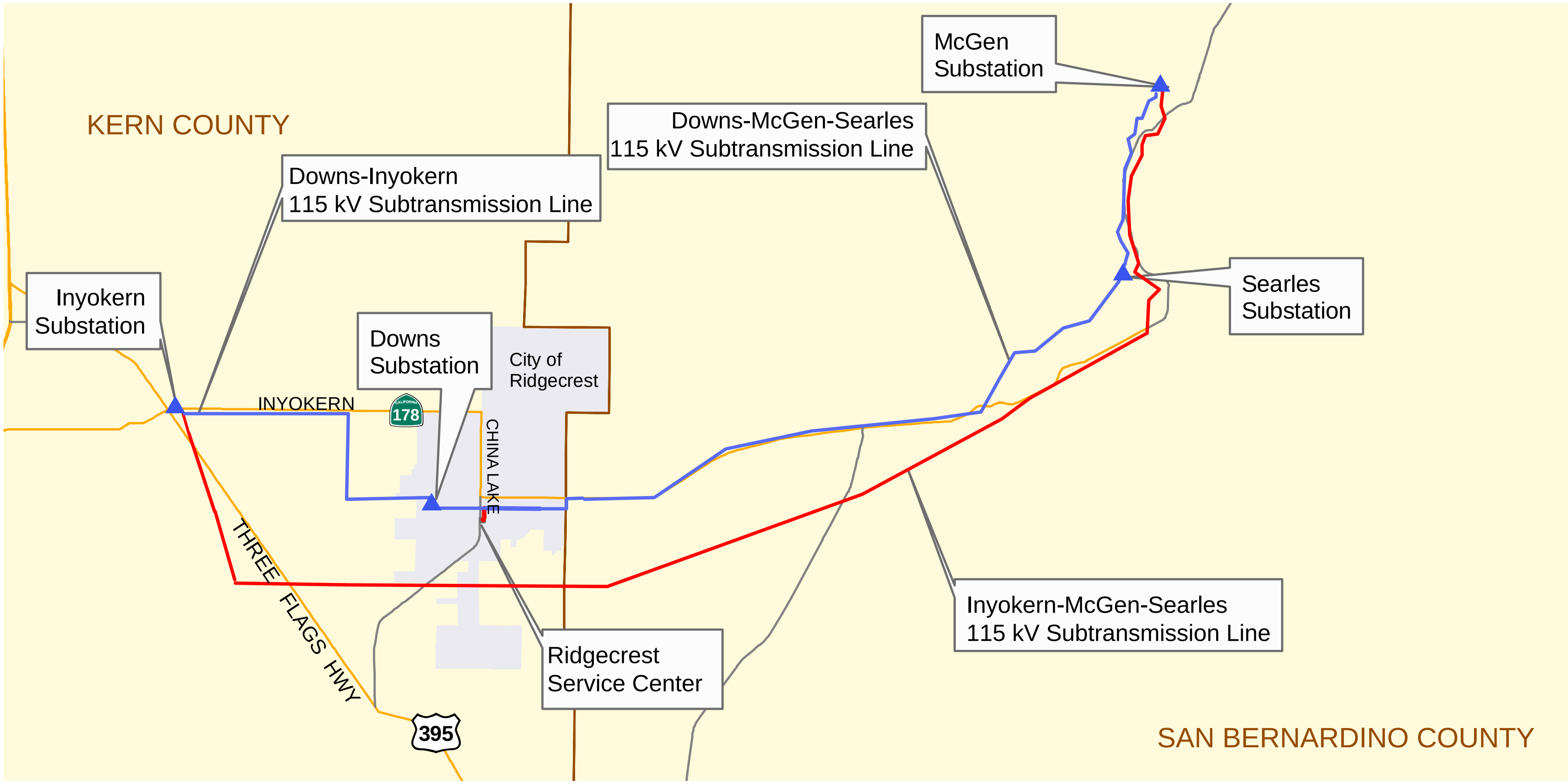
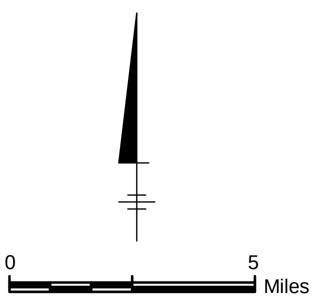
FIGURE
3.1-6



LEGEND

- New 115 kV Subtransmission Lines
- Renamed 115 kV Subtransmission Lines
- Highway
- Substation



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DOWNS SUBSTATION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED 115 kV SUBTRANSMISSION LINE ROUTES IN THE VICINITY OF THE PROJECT AREA

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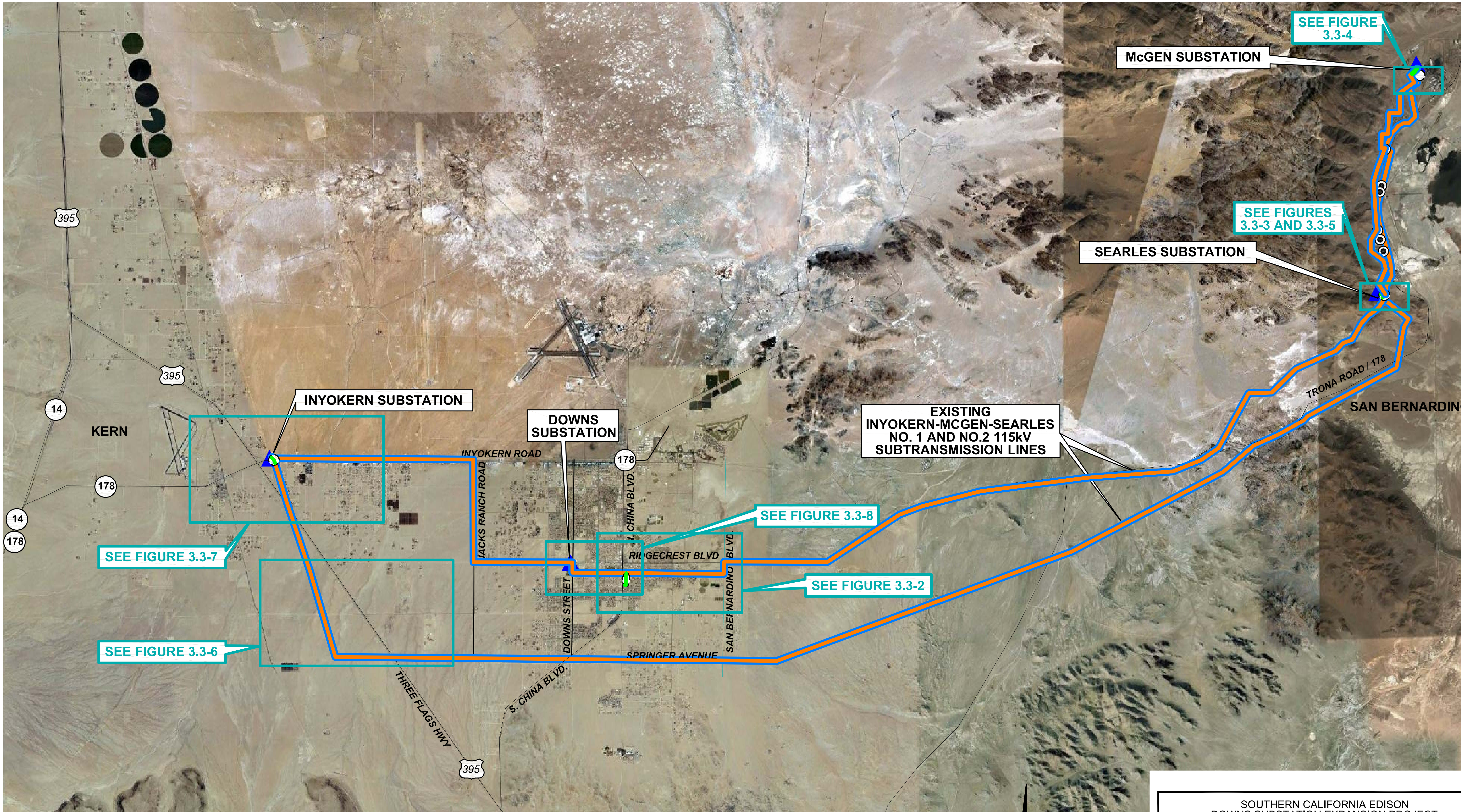
FIGURE **3.1-7**

3.1.3 Fiber Optic Telecommunication System Description

3.1.3.1 General Description

The Proposed Project requires the installation of a new fiber optic telecommunication system to provide proper protection, control, and monitoring of the transmission/subtransmission lines and major equipment. This new fiber optic telecommunication system would also provide voice and data communications between the expanded Downs Substation and other SCE facilities. The proposed new fiber optic telecommunication system, as described further below, would provide redundant routing of the communication circuits to reliably support the Proposed Project.

The telecommunications work would include installing approximately 58 miles of new fiber optic telecommunication cable primarily on existing wood poles located between Downs, Searles, McGen, and Inyokern Substations. Based on preliminary engineering, approximately six of the existing wood poles would need to be replaced in order to support the new fiber optic telecommunication cable. An overview of the fiber optic telecommunication route and the locations of the six poles that need to be replaced are shown on Figure 3.1-8.



LEGEND

REPLACEMENT POLES

SUBSTATION

EXISTING INYOKERN-MCGEN-SEARLES NO. 1 AND NO. 2 115 kV SUBTRANSMISSION LINES

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (UNDERGROUND)

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (OVERHEAD)

0 10,000' 20,000'

GRAPHIC SCALE

SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

OVERVIEW OF PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE

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FIGURE
3.1-8

To provide fiber optic telecommunication cable connectivity to the proposed Downs 115 kV Substation, an existing fiber optic telecommunication cable that runs between Inyokern Substation and Ridgecrest Service Center (ISRSC cable) would be utilized by installing two new fiber optic telecommunication cable taps from the ISRSC cable into the proposed Downs Substation MEER, as described below.

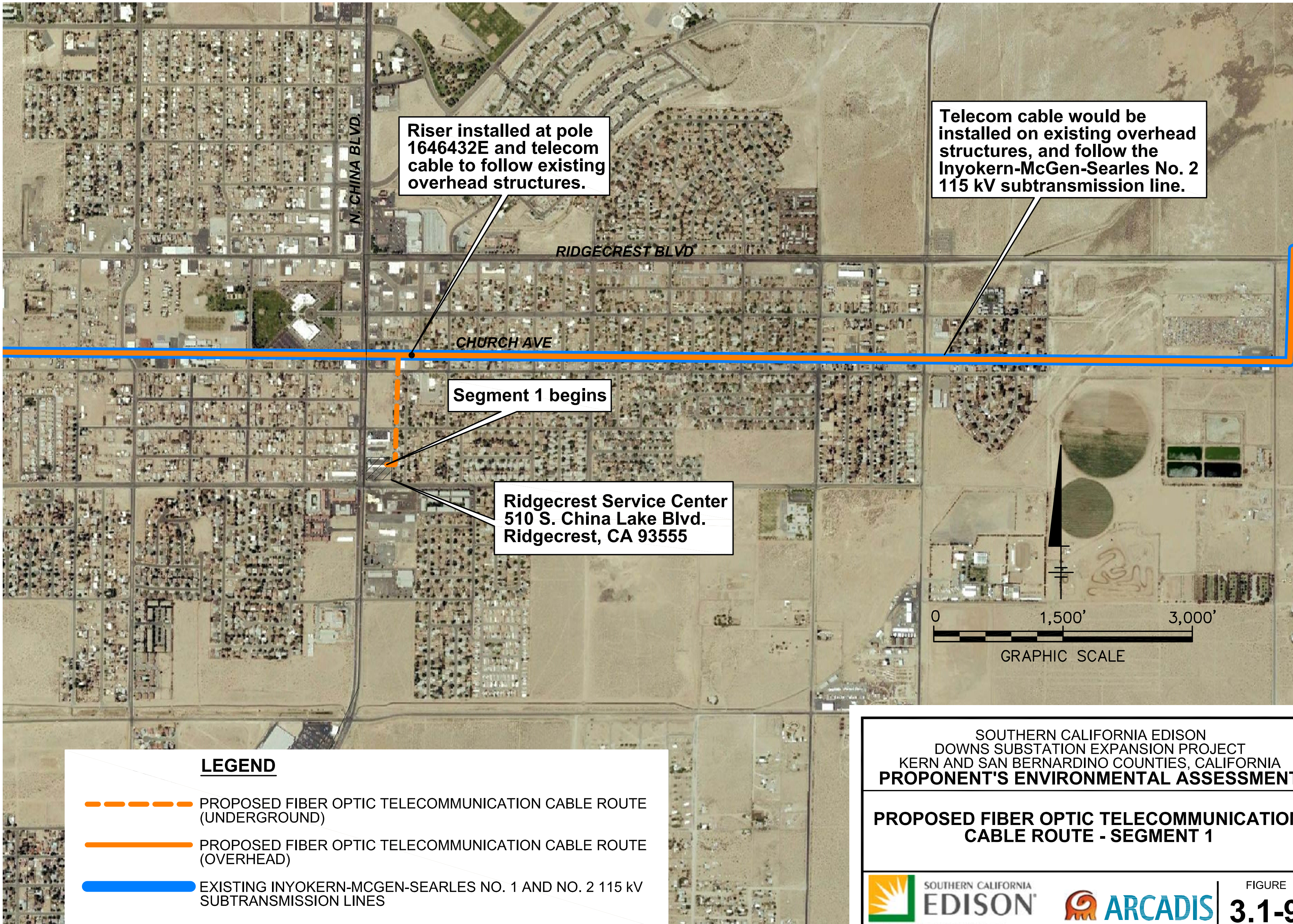
Installation of new telecommunication equipment would consist of fiber optic terminals, multiplexers, and other telecommunication equipment devices installed at each of the above substations. Fiber optic telecommunication equipment located at Ridgecrest Service Center would be fitted with additional equipment capacity to provide the necessary gain to allow the telecommunications to travel the increased distance created by the new fiber optic telecommunication cable.

3.1.3.2 Fiber Optic Telecommunication Cable Route

The proposed fiber optic telecommunication cable route would consist of approximately 58 miles of new fiber optic telecommunication cable and approximately 10 miles of existing fiber optic telecommunication cable. The fiber optic telecommunication cable would interconnect Ridgecrest Service Center, Searles Substation, McGen Substation, and Inyokern Substation. See Figure 3.1-8 for an overview of the proposed fiber optic telecommunication cable route.

The approximately 58 miles of proposed new fiber optic telecommunication cable would consist of the following four main segments, as shown on Figures 3.1-9 through 3.1-15:

- Approximately 18 miles of new fiber optic telecommunication cable between Ridgecrest Service Center and Searles Substation. Portions of this cable would attach to the Inyokern-McGen-Searles No. 2 115 kV subtransmission pole line.
- Approximately 6 miles of new fiber optic telecommunication cable between Searles Substation and McGen Substation. Portions of this cable would attach to the Inyokern-McGen-Searles No. 2 115 kV subtransmission pole line.
- Approximately 5 miles of new fiber optic telecommunication cable between McGen Substation and Searles Substation. Portions of this cable would attach to the Inyokern-McGen-Searles No. 1 115 kV subtransmission pole line.
- Approximately 29 miles of new fiber optic telecommunication cable between Searles Substation and Inyokern Substation. Portions of this cable would attach to the Inyokern-McGen-Searles No. 1 115 kV subtransmission pole line.



SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENT 1

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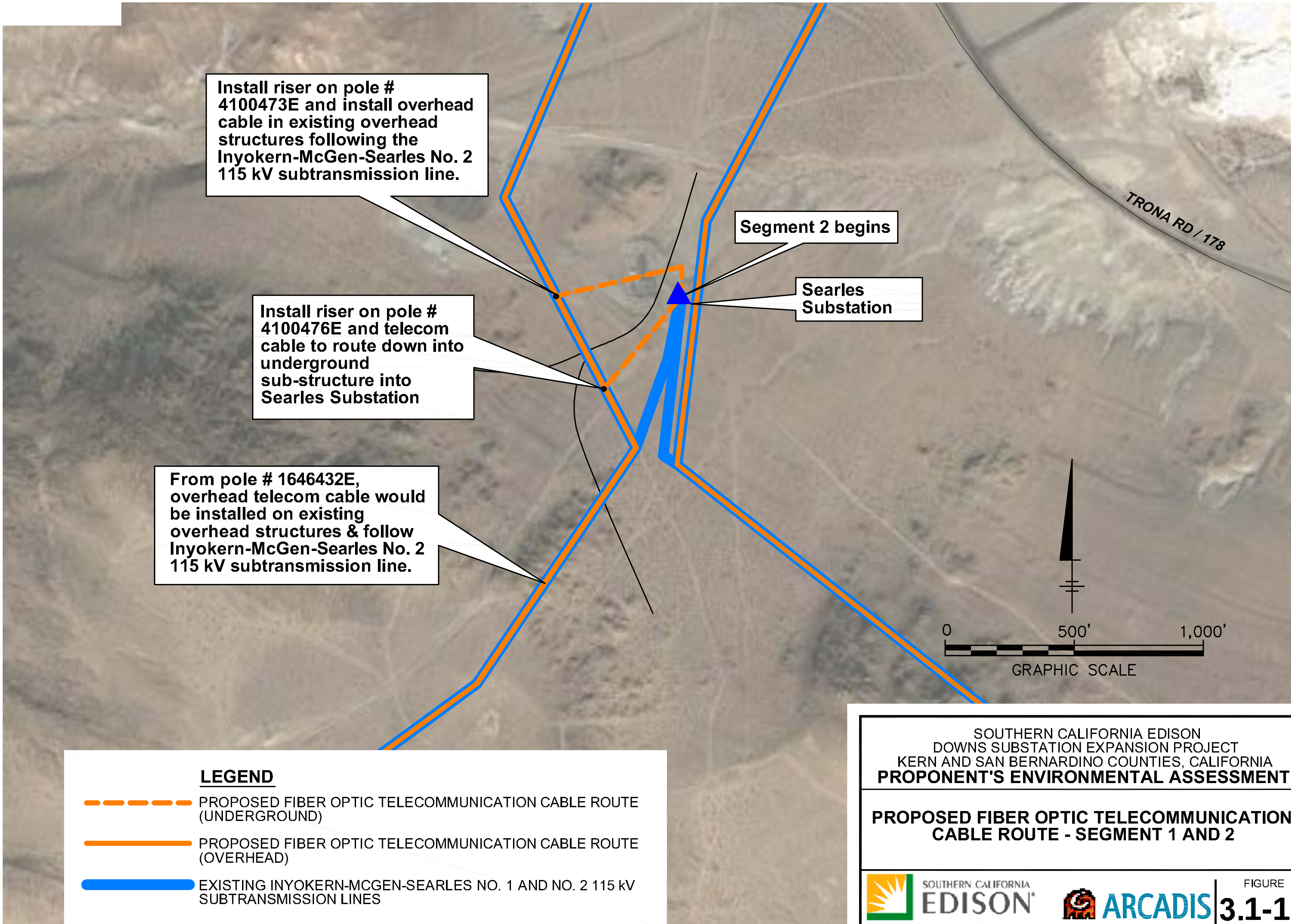
FIGURE
3.1-9



SOUTHERN CALIFORNIA EDISON
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KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA

PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENT 1 AND 2

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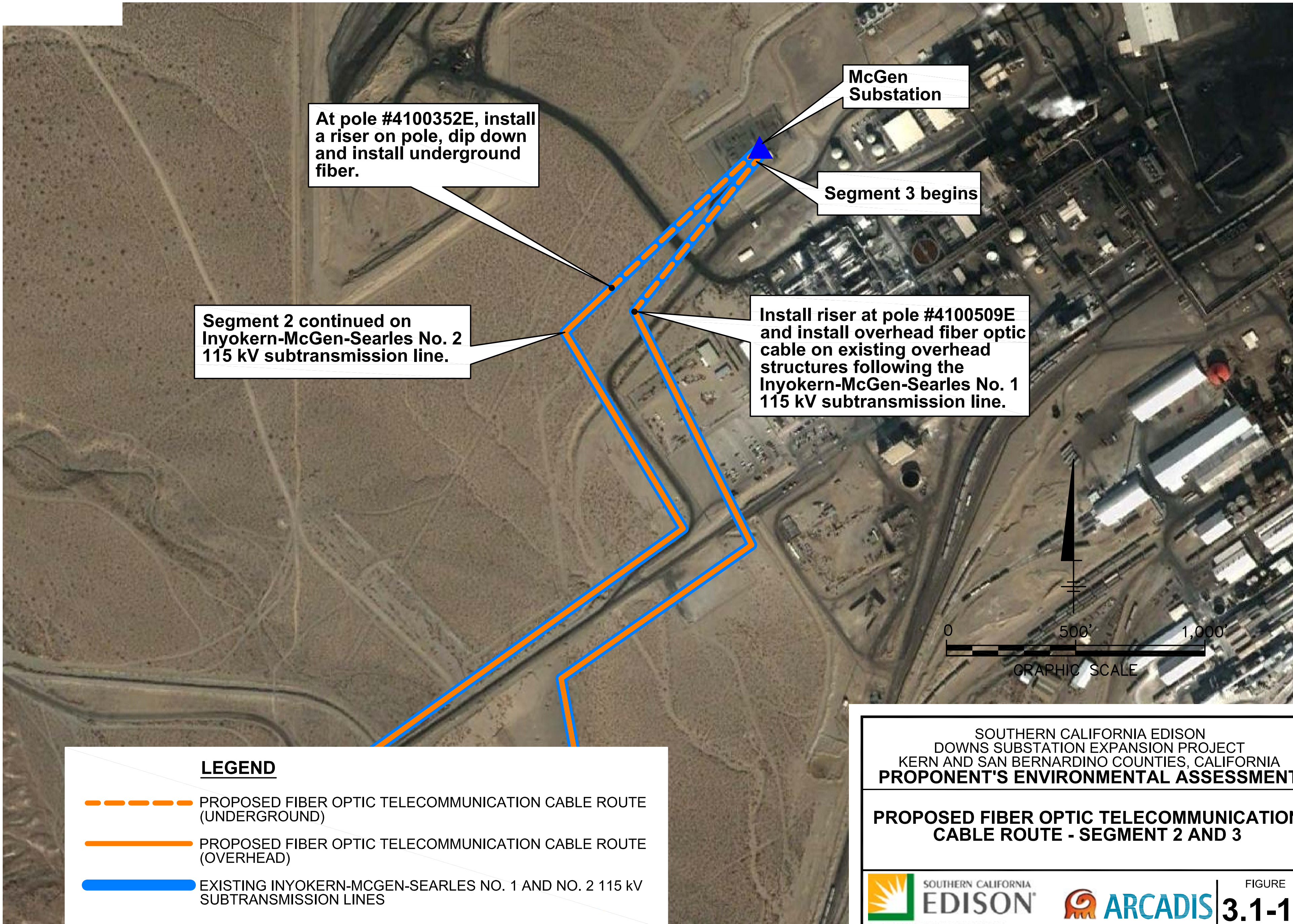
FIGURE
3.1-10



LEGEND

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (UNDERGROUND)

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (OVERHEAD)

EXISTING INYOKERN-MCGEN-SEARLES NO. 1 AND NO. 2 115 kV SUBTRANSMISSION LINES

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DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA

PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENT 2 AND 3

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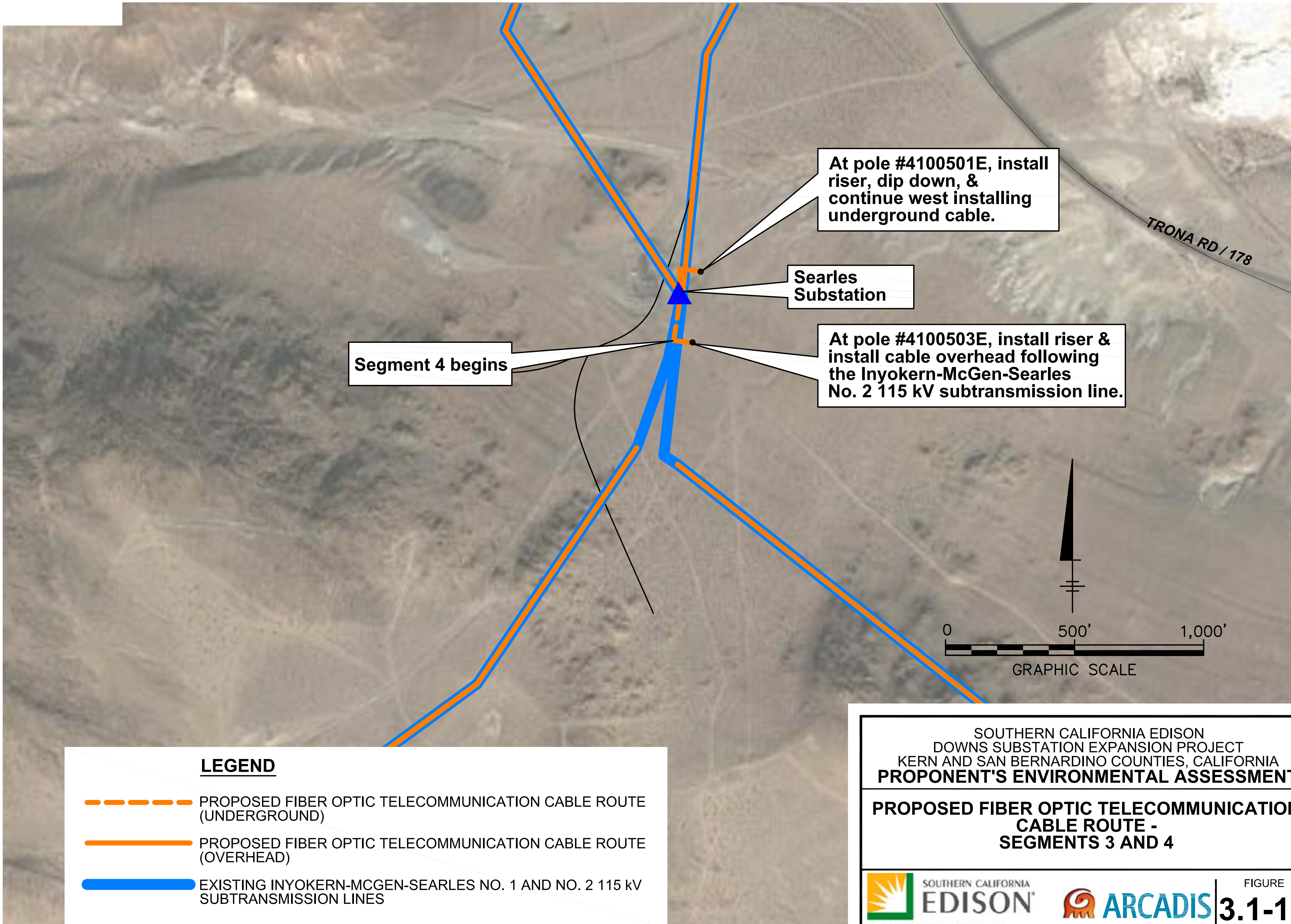
FIGURE
3.1-11



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DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENTS 3 AND 4

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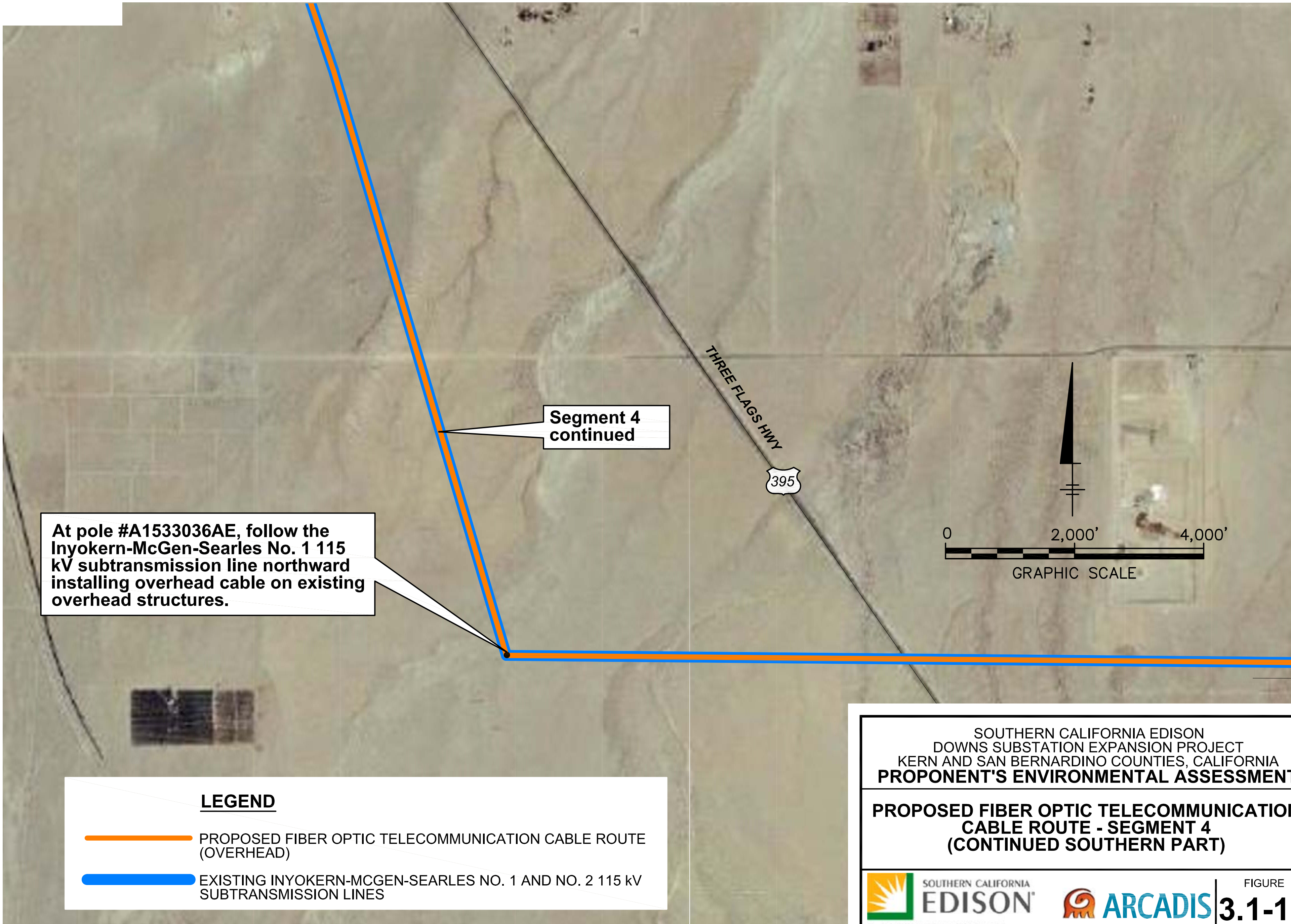
FIGURE **3.1-12**



SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENT 4 (CONTINUED SOUTHERN PART)

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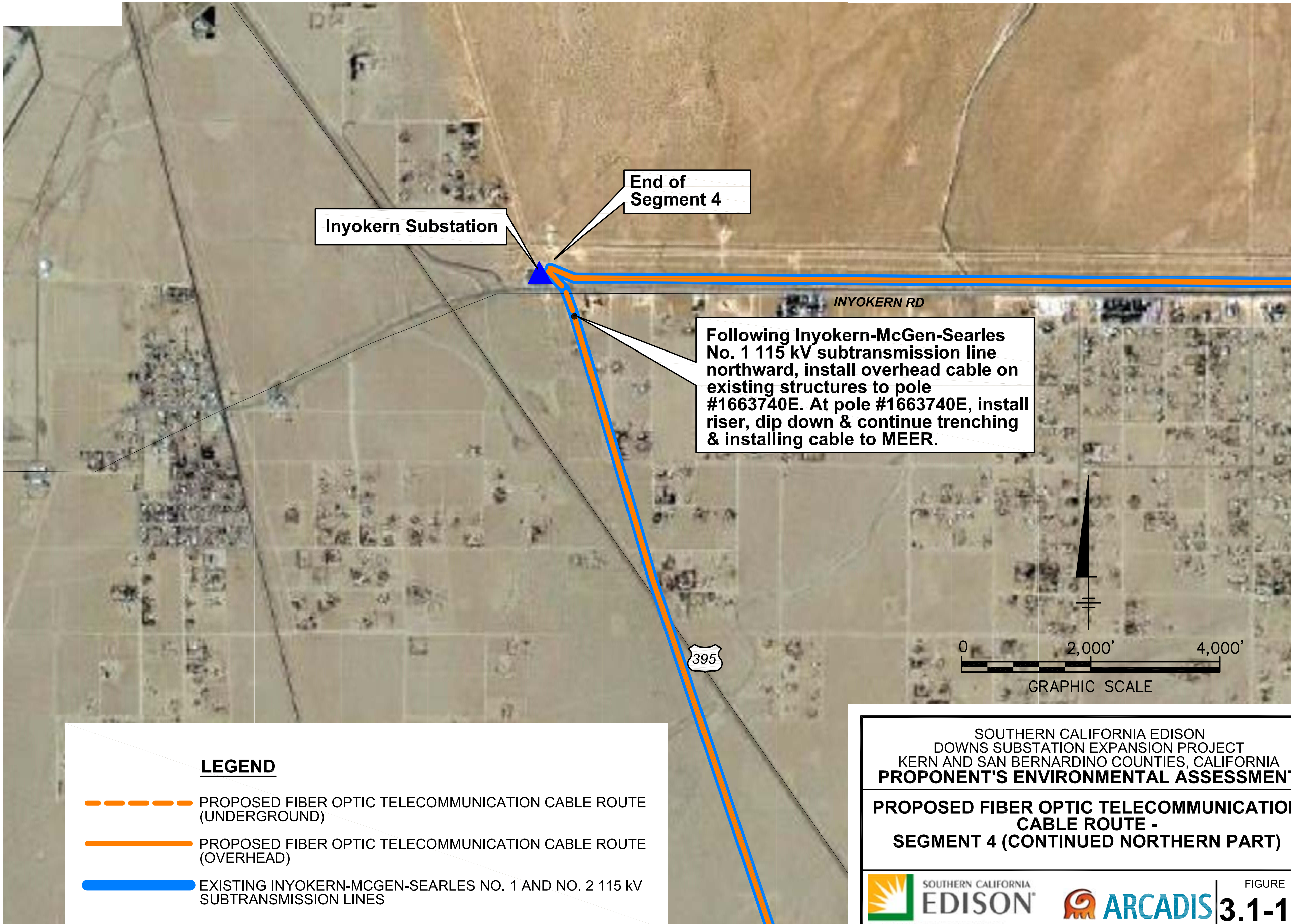
FIGURE **3.1-13**



LEGEND

- PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (UNDERGROUND)
- PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (OVERHEAD)
- EXISTING INYOKERN-MCGEN-SEARLES NO. 1 AND NO. 2 115 kV SUBTRANSMISSION LINES

SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENT 4 (CONTINUED NORTHERN PART)

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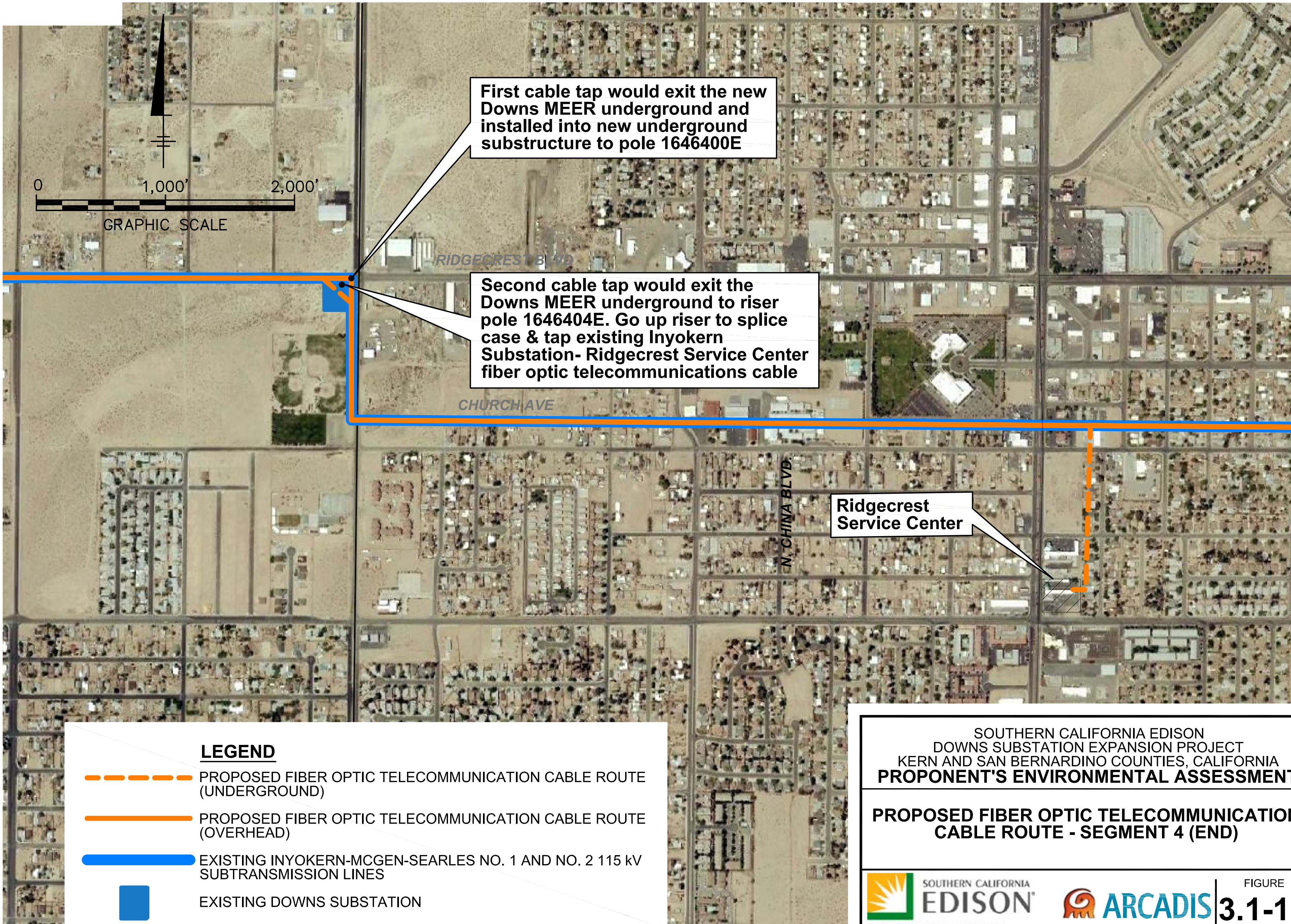
FIGURE
3.1-14



LEGEND

- PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (UNDERGROUND)
- PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE (OVERHEAD)
- EXISTING INYOKERN-MCGEN-SEARLES NO. 1 AND NO. 2 115 kV SUBTRANSMISSION LINES
- EXISTING DOWNS SUBSTATION

SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION EXPANSION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

PROPOSED FIBER OPTIC TELECOMMUNICATION CABLE ROUTE - SEGMENT 4 (END)

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FIGURE
3.1-15

Between Inyokern Substation and Ridgecrest Substation, the Proposed Project would use approximately 10 miles of existing fiber optic telecommunication cable. This fiber optic telecommunication cable would provide connectivity and telecommunication services to the proposed Downs Substation. It is anticipated that two fiber optic telecommunication cable taps would be made from the proposed Downs Substation MEER to the ISRSC fiber optic telecommunication cable. The fiber optic telecommunication cable would enter into Downs Substation and the Downs Substation MEER through the use of risers attached to poles and underground conduit.

3.1.3.3 Fiber Optic Telecommunication Equipment

New fiber optic terminal equipment, channel multiplexing equipment, equipment cabling, and other telecommunication equipment devices would be installed within the proposed Downs Substation MEER, Searles Substation MEER, McGen Substation MEER, and Inyokern Substation telecommunications room. Upgrading the optical terminal equipment at the Ridgecrest Service Center telecommunication room would allow for the increased distance incurred by the additional fiber optic telecommunication cable to Searles Substation. This work would provide the required telecommunication circuit connection to subtransmission and substation equipment.

3.2 Proposed Project Construction Plan

Construction of the Proposed Project would include activities associated with land surveying, replacement of existing poles, installation of new subtransmission poles, transfer of existing distribution facilities from the existing poles to the new subtransmission poles, substation construction, and telecommunications installation. In addition, construction support activities such as the establishment of staging yards and the development of access roads extending to construction sites would be required. The following subsections describe the construction activities associated with the Proposed Project.

3.2.1 Construction of All Components

3.2.1.1 Dust Control

During construction, water trucks and other Best Available Control Measures would be used to minimize the quantity of fugitive dust created by construction, per the Eastern Kern Air Pollution Control District Rule 402, Fugitive Dust and the Mojave Desert Air Quality Management District's Rule 403.1, Fugitive Dust Control for the Searles Valley Planning Area. The quantity of water necessary for dust control would be determined by atmospheric and meteorological conditions during construction and the provisions contained in the dust control plan prepared for the project. The source of the water for this purpose is unknown at this time.

3.2.1.1 Traffic Control

Construction activities conducted within public streets may require the use of traffic control measures. Any potential lane closures required for construction of the Proposed Project would be consistent with local ordinances. Commonly used traffic control measures include those published in the California Joint Utility Traffic Control Manual (2010).[18]

3.2.1.2 Construction Hours

Construction efforts for the Proposed Project would occur in accordance with accepted construction industry standards. Construction activities would generally adhere to the noise ordinance of the local jurisdiction. In the event construction activities are necessary on days or hours outside of what is specified by ordinance (for example, if existing lines must be taken out of service for the work to be performed safely and the line outage must be taken at night for system reliability reasons), SCE would obtain variances as necessary from appropriate jurisdictions where the work would take place.

3.2.1.3 Post-Construction Cleanup

SCE would restore, to the extent feasible, all areas that are temporarily disturbed by Proposed Project activities once construction is complete. Restoration areas could be inclusive of, but not limited to, some access roads, staging yards and staging areas, pull, tension and splicing sites, and pull box locations. Activities associated with restoration of these areas would include restoring original contours and reseeding (with native seed mix). All construction materials and debris would be removed from the area and recycled or properly disposed of at an off-site disposal facility in accordance with all applicable laws.

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18 Available at: http://www.sce.com/NR/rdonlyres/E6D6B5B3-230D-473F-96FB-FEBEA9C52223/0/100422_CaliforniaJointUtilityTrafficControlManual.pdf.

3.2.2 Downs Substation Construction

3.2.2.1 Temporary Staging Yards

Construction of the Proposed Project would require the establishment of temporary staging yards; the locations of the yards are shown on Figure 3.2-1. SCE anticipates using a portion of the SCE-owned property adjacent to the existing Downs Substation as a staging yard for the expansion of Downs Substation and 115 kV subtransmission line construction activities at or near Downs Substation (see Figure 3.1-2). SCE anticipates using the Ridgecrest Service Center or a portion of the SCE-owned property adjacent to the existing Downs Substation as a staging yard for the subtransmission poles that would need to be replaced in connection with the telecommunications construction activities.

Each staging yard could 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. Maintenance and refueling of construction equipment would also be conducted at these staging yards. Preparation of the Downs Substation staging yard may, depending on existing ground conditions at the yard site, include grading of the area prior to use. SCE grading and staging yard use would comply with appropriate dust control measures imposed by the Eastern Kern Air Pollution Control District. Temporary perimeter fencing would be installed for security and theft control purposes.

Materials commonly stored at the staging yards would include, but not be limited to: construction trailers; portable sanitation facilities; electrical equipment such as circuit breakers, disconnect switches, lightning arresters, transformers, capacitor banks, reactor banks, vacuum switches, conduit, grounding, insulators, conductor, cable reels, pull boxes, line hardware, steel/wood poles, conductor reels, ground wire reels, insulators, and crossarms; steel beams; rebar; foundation cages; signage; consumables (such as fuel and filler compound); waste materials for salvaging, recycling, or disposal; and Best Management Practices (BMP) materials (straw wattles, gravel, and silt fences).

A majority of materials associated with the construction efforts would be delivered by truck to a staging yard, while some materials may be delivered directly to the lay down area. Activities would be scheduled in accordance with the City of Ridgecrest Municipal Code. SCE would obtain variances as needed.

SOUTHERN CALIFORNIA EDISON
DOWNS SUBSTATION PROJECT
KERN AND SAN BERNARDINO COUNTIES, CALIFORNIA
PROPONENT'S ENVIRONMENTAL ASSESSMENT

TEMPORARY STAGING YARD LOCATIONS

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FIGURE
3.2-1

3.2.2.2 Storm Water Pollution Prevention Plan

Construction of the Proposed Project would disturb a surface area greater than one acre, therefore SCE would be required to obtain a Construction General Permit-2009-0009-DWQ (2009 CGP) from the State Water Resources Control Board. To acquire this permit, SCE would comply with the requirements of the 2009 CGP, including preparation of a SWPPP inclusive of project information, design features, and monitoring and reporting procedures. The SWPPP would be based on final engineering design and would include all project components.

3.2.2.3 Site Preparation and Grading

The proposed Downs Substation location would be prepared by clearing existing vegetation within the boundaries of the proposed Downs Substation footprint. Once vegetation clearance is completed, the location would be graded in accordance with approved grading plans. A chain link fence would be installed around the proposed Downs Substation perimeter. As previously discussed, the proposed Downs Substation location would serve as a staging yard for construction activities and would have a construction trailer, security guard trailer, construction equipment, and electrical equipment located thereon.

3.2.2.4 Construction

After the proposed Downs Substation location is graded, below-grade facilities would be installed. Below-grade facilities include a ground grid, cable trenches, equipment foundations, conduits, duct banks, utilities, footings for the perimeter fence, and an uncovered detention basin. The design of the ground grid would be based on soil resistivity measurements collected during the geotechnical investigation. Excavations would generally be no deeper than 3 feet, with the exception of the foundation for the 115 kV deadend racks (which would require an excavation of approximately 20 feet), and the uncovered detention basin (the excavation depth will depend on the results of final engineering).

3.2.2.5 Above-Grade Construction

Above-grade installation of proposed Downs Substation facilities such as buses, capacitors, switchracks, disconnect switches, circuit breakers, transformers, steel support structures, perimeter fence, restroom facilities, and the Downs Substation MEER would generally commence after the below-grade structures are in place.

3.2.2.6 Access to the Substation Location

Access to the proposed Downs Substation location for both construction and operations would occur through a new access gate in the existing substation's northern fence line to Ridgecrest Boulevard (see Figures 3.1-2 and 3.1-3). The access road to be constructed by SCE would be 24 feet in width, with a 2-foot wide shoulder on each side. Construction of the access road would require the compaction of the sub-soil and placing a six-inch thick layer of compacted aggregate road-base. In order to accomplish the above road improvements, an average width of 30 feet of land disturbance has been assumed, including allowances for side slopes and surface runoff control, resulting in a total land disturbance of approximately 0.2 acre.

3.2.3 Overhead 115 kV Subtransmission Line Construction

The following sections describe the construction activities associated with installing the overhead 115 kV subtransmission lines for the Proposed Project.

3.2.3.1 Survey

Construction activities would begin with the survey of the 115 kV subtransmission line segments. The survey crew would stake the pole locations, including reference points and centerline hubs. The survey crew would include the limits of the grading for pole excavations.

3.2.3.2 Access Roads

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

The 115 kV subtransmission line portion of the project involves construction within existing 115 kV subtransmission line easement areas, public road right-of-ways (franchise areas[19]), and Bureau of Land Management (BLM) grant areas (collectively, "ROW"). Existing public roads and existing transmission line roads would be used as much as possible during construction of this project. SCE currently possesses three ROW Grants that cover all access roads located on BLM lands. SCE would be required to obtain an amendment to the ROW Grants to authorize addition of fiber optic telecommunication cables to the existing 115 kV subtransmission poles, and replacement of

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19 A franchise is a grant to permit public and private utilities to use and occupy the right-of-way of public roads for the construction and maintenance of public and private utilities.

an existing wood pole (the other five poles are located on private land) on the 115 kV subtransmission route. In addition, portions of the 115 kV subtransmission line route cross CLNAWS. Although such portions of the route are authorized by the ROW Grants, SCE is required to obtain approval to perform construction from the Department of the Navy. As discussed in more detail in Section 4.10.2, SCE has initiated communications with both BLM and the Department of the Navy.

Portions of the new 115 kV subtransmission line segments would require new access roads; currently, the only new access roads planned would be located near to Downs Substation. Approximately 1,000 feet of new access road would need to be constructed adjacent to the new 115 kV subtransmission line route, resulting in a disturbance of approximately 0.4 acres. No new access roads are planned for the telecommunication portion of the Proposed Project. Similar to road maintenance of existing roads, construction activities for new access roads include the following:

- New road alignments would be cleared and grubbed of vegetation and then blade-graded to remove potholes, ruts, and other surface irregularities. Fill material would be deposited, where necessary, and roads would be re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment.

- Roads would be a minimum of 14 feet in width, with 2 feet of shoulder on each side, but roads may be wider depending on final engineering.

- Road gradients would be leveled so that any sustained grade does not exceed 12 percent. All curves would have a curvature radius of not less than 50 feet measured at the center line of the usable road surface. Roads typically would have turnaround areas near the structure locations.

Any excess excavated material from grading the access roads would be properly disposed of off site in accordance with all applicable laws.

3.2.3.3 Lightweight Steel Pole Installation

LWS poles would be installed in native soil. LWS pole holes would be drilled to individual pole specifications as required. A backhoe may be utilized to dig the pole holes as well, depending on site-specific conditions. Once the LWS poles are set in place, bore spoils (material from holes drilled) would be used to backfill the holes. If the bore spoils are not suitable for backfill, imported fill material, such as clean fill dirt or crushed rock, would be used. Excess bore spoils would be distributed at each pole site, used as backfill for the holes left after removal of nearby poles (if any), or disposed of off site in accordance with all applicable laws.

LWS poles consist of separate base and top sections. Steel pole installation consists of hauling the pole sections from a staging yard to the structure site using semi-trucks with 40-foot trailers. Where feasible, a line truck would unload the individual steel pole sections on the ground in the temporary laydown area at each pole location. The typical laydown area for LWS poles would be approximately 150 feet by 75 feet (0.26 acre). While on the ground, the top section could be configured with the necessary cross arms, insulators, and wire-stringing hardware before being set in place.

A line truck with an attached boom would be used to set LWS poles into previously prepared holes. When the base section is secured, the top section would be placed above the base section and the two sections would be slip joined together. The two sections may also be spot welded together for additional stability. The pole sections could also be assembled into a complete structure and then set by jacking both sections together while on the ground, but this would depend largely on the terrain and available equipment.

3.2.3.4 Wood Pole Installation

SCE would need to replace approximately six existing 115 kV subtransmission line wood poles of various pole head configurations that range between 58 to 70 feet above grade. SCE would install approximately six new poles of various head configurations that would be direct-buried to a depth of approximately 8 to 10 feet below grade and that range between 65 to 70 feet above ground on the existing Inyokern-McGen-Searles No. 1 115 kV subtransmission line as required to support the new fiber optic telecommunication cable where the existing wood poles do not meet CPUC G.O. 95 wind loading requirements and/or SCE design standards. Additionally, two wood stub poles (one new and one replaced) and associated guying and anchors would be required.

Each wood pole would require a hole to be excavated using either an auger, backhoe, or hand digging. The wood poles would be placed in temporary laydown areas at each pole location. While on the ground, the wood poles may be configured (if not preconfigured) with the necessary cross arms, insulators, and wire-stringing hardware before being set in place. The wood poles would then be installed in the holes, typically by a line truck with an attached boom. 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.

3.2.3.5 Tubular Steel Pole Installation

The Proposed Project would require the installation of TSPs. TSP installation is performed in two phases: foundation installation and structure assembly/erection. Each TSP location would require a temporary laydown area that could be cleared and/or graded to provide a reasonably level surface free of vegetation for footing construction, assembly, and erection of the TSPs. The typical laydown area for TSPs would be approximately 200 feet by 100 feet (0.46 acres). If the existing terrain around the structure is not suitable to support crane activities, a temporary crane pad measuring 50 feet by 50 feet (0.06 acres) would be constructed within the laydown area.

Each TSP would require a single drilled, poured-in-place, concrete footing that would form the structure foundation. The foundation process starts with drilling the hole for each structure. The holes would be drilled using truck or track-mounted excavators with various diameter augers to match the diameter requirements of the structure. Based on preliminary engineering, TSPs would require an excavated hole approximately 2 to 6 feet in diameter and approximately 20 to 30 feet deep. 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 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.

Following excavation of the foundation footing, a steel reinforced rebar cage would be set, anchor bolts would be positioned and survey verified, and concrete would then be poured. Steel reinforced rebar cages would be assembled off site and delivered to each structure location by flatbed truck. Typically, TSP structures would require approximately 25 to 40 cubic yards of concrete delivered to each structure location. TSP footings could project approximately 0 to 3 feet above ground level.

Foundations in soft or loose soil that extend below the groundwater level may be stabilized with drilling mud slurry, a commercially-available product. Mud slurry would be placed in the hole after drilling to prevent the sidewalls from sloughing. The concrete for the foundation would then be pumped to the bottom of the hole, displacing the mud slurry. During this process, no groundwater would come to the surface; therefore, no de-watering of the hole would be necessary. The mud slurry brought to the surface would be collected in a Baker tank and stored for re-use for the same purpose or transported to an off-site disposal facility in accordance with all applicable laws. Mud slurry is non-hazardous and bio-degradable. Mud slurry would not be used if groundwater is not encountered. Groundwater levels will be determined during final engineering. If no groundwater is present, caissons or corrugated pipe would be inserted into the hole where loose soils are a factor to keep the hole from caving or sloughing.

During construction, concrete would be obtained from area vendors (mixing would not occur on location). Concrete samples would be drawn at time of pour and tested to ensure engineered strengths were achieved. A normally specified SCE concrete mix typically takes approximately 20 working days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erecting the structure.

TSPs consist of separate base and top sections; depending on the height of the TSP, the base and top sections may be fully assembled by the manufacturer prior to shipment to SCE, or the base and top sections may be shipped in sections. TSP installation consists of hauling the assembled pole or pole sections from a staging yard to the structure location using semi-trucks with trailers. Where feasible, a crane would unload the individual pole sections or the assembled pole on the ground within the designated laydown area. While on the ground, the assembled pole or the top section of the pole (if there are separate base and top sections) would be configured with the necessary cross arms, insulators, and wire-stringing hardware before being set in place.

A crane would be set up approximately 60 feet from the centerline of each structure. From that location, the crane would be utilized to set each base section or assembled pole on top of previously prepared foundations. If separate base and top sections are utilized, the top section of the TSP would be set into place onto the secured base section and the two sections would be welded together.

After construction is completed, the TSP site 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 damage the structure footing. The graded area would be compacted and capable of supporting heavy vehicular traffic.

3.2.3.6 Conductor/Wire Stringing

Wire-stringing activities would be conducted in accordance with SCE specifications that are similar to process methods detailed in Institute of Electrical and Electronics Engineers (IEEE) Standard 524-2003, Guide to the Installation of Overhead Transmission Line Conductors.

place prior to the initiation of wire-stringing activities. Advanced planning by supervision is required to determine circuit outages, pulling times, and safety protocols to ensure that the wire installation is accomplished safely.

Wire-stringing includes all activities associated with the installation of the primary conductors onto subtransmission structures. These activities typically include the installation of conductor, shield wire (OHGW or OPGW), vibration dampers, weights, and suspension and dead-end hardware assemblies for the entire length of the proposed 115 kV subtransmission route. Insulators and stringing sheaves (rollers or travelers) are also attached as part of the wire-stringing activities.

The puller, tensioner, and splicing set-up locations associated with the Proposed Project would be temporary, and the land would be restored to its previous condition, to the extent feasible, following completion of pulling and splicing 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 final engineering. The approximate area needed for stringing set-ups associated with wire installation is variable and depends upon terrain. The preferred set-up areas are 400 feet by 100 feet (0.92 acre) for tensioning equipment, 300 feet by 100 feet (0.69 acre) for pulling equipment, and 150 feet by 100 feet (0.34 acre) for splicing equipment. However, crews can work from within smaller areas when space is limited.

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, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment set-up locations. On relatively straight alignments, typical wire pulls occur approximately every 6,000 to 8,000 feet in flat terrain. When the alignment contains multiple deflections or is situated in rugged terrain, the length of the wire pull is diminished. 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 set-up positioned at one end and a tensioner set-up with wire reel stand truck positioned at the opposite end of the wire pull.

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

Step 1. Develop a wire-stringing plan to determine the sequence of wire pulls and the set-up locations for the wire pull/tensioning/splicing equipment.

Step 2. Sock Line Threading: A bucket truck would be used to install a lightweight sock line from structure to structure. The sock line would be threaded through the wire rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for the wire pull.

Step 3. Pulling: The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.

Step 4. Sagging and Dead-ending: After the conductor is pulled in, if necessary, all midspan splicing would be performed. Once the splicing has been completed, 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).

3.2.3.7 Guard Structures

Guard structures are temporary facilities that would typically be installed at transportation, flood control, and utility crossings for wire stringing activities. These structures are designed to stop the movement of a conductor should it momentarily drop below a conventional stringing height. Typical guard structures are standard wood poles, 40 to 60 feet tall. Depending on the overall width of the conductors being installed, two to four guard poles would be required on either side of a crossing. Temporary netting could also be installed to protect some types of under-built infrastructure. The guard structures are removed after the conductor is secured into place. In some cases, the wood poles may be substituted with the use of specifically equipped boom trucks staged to prevent the conductor from dropping.

SCE estimates approximately six guard structures would need to be constructed along the proposed route.

For highway, railroad, and open channel aqueduct crossings, SCE would work closely with the applicable jurisdiction to secure the necessary permits to string conductor over the applicable infrastructure.

3.2.3.8 Energizing of the 115 kV Subtransmission Lines and Top/Removal of Existing Poles

The existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line would be de-energized, as required, in order to connect the new 115 kV subtransmission line segments to the proposed Downs Substation. Once the transfer of existing 115 kV subtransmission lines to the new structures is complete, the 115 kV subtransmission lines would be returned to service (re-energized). Thereafter, the distribution lines and fiber optic telecommunication cable would be transferred to the new structures as well.

After the cutover (energizing of the new line segments) of the new Downs-McGen-Searles 115 kV subtransmission line and the new Downs-Inyokern 115 kV subtransmission line, approximately 1,000 feet of existing conductor, insulators, and line hardware would be removed from the existing wood poles at Downs Substation along Ridgecrest Boulevard and Downs Road. Thereafter, these existing wood poles would remain in place, but would be topped (cut) above the distribution lines.

After the transfer of existing 115 kV subtransmission lines, distribution lines, and fiber optic telecommunication cable to the new structures, the existing poles that are not topped would be completely removed. Structure footings, if any, would be removed to a depth of approximately two feet below ground level. Holes would be backfilled, compacted, and the area would be smoothed to match surrounding grade. Depending on their condition and original chemical treatment, any wood poles removed may be reused by SCE, returned to the manufacturer, disposed of in a Class I hazardous waste landfill, or disposed of in the lined portion of a Regional Water Quality Control Board (RWQCB)-certified municipal landfill.

A temporary laydown area adjacent to each existing structure being worked on would be required for equipment and material staging. The laydown area would be approximately 150 feet by 75 feet (0.26 acre) in size. Each structure would require a line truck or rough terrain crane to support the structure during dismantling and removal. If the existing terrain is not suitable to support crane activities, a temporary crane pad measuring 50 feet by 50 feet (0.06 acre) would be constructed within the laydown area.

3.2.4 Fiber Optic Telecommunication System Construction

To meet the Proposed Project requirements for the 115 kV subtransmission line protection and substation Supervisory Control And Data Acquisition (SCADA), communication, control, and monitoring, a fiber optic telecommunications system connecting Downs Substation, Ridgecrest Service Center, Searles Substation, McGen Substation, and Inyokern Substation would be constructed. The following provides detail on the construction activities associated with this telecommunications system. SCE or contractor crews would install telecommunications equipment and construct the required fiber optic telecommunication cable.

The following sections provide detail on the construction activities associated with the telecommunications improvements. SCE or contractor crews would use standard construction methods to install telecommunications equipment and construct the required fiber optic telecommunication cable. The crews would comply with all rules, regulations, standards, and agency requirements while in their performance of the construction phase.

The telecommunications facilities represented in this document and the proposed construction activities are based on the present project requirements and planning level assumptions. Upon completion of preliminary and final engineering, identification of field conditions, verification of availability of materials and equipment, and compliance with applicable environmental and permitting requirements, the detail presented in the telecommunication sections may change as further details are developed and as the project progresses.

3.2.4.1 Equipment Construction Activities

New fiber optic terminal equipment, channel multiplexing equipment, and other telecommunication equipment devices would be installed on equipment racks located within the Downs Substation MEER, Searles Substation MEER, McGen Substation MEER, and Inyokern Substation telecommunications room. Upgrading the existing optical terminal equipment at the Ridgecrest Service Center telecommunication room would be required. The new telecommunication equipment installation and the attachment of the proposed new fiber optic telecommunication cable would allow the configuration of new optical cable lightwave system connecting the above locations. Telecommunication circuits for line protection, SCADA, communication, control, and monitoring would be configured and wired to the appropriate transmission/substation relays or equipment.

Equipment installation activities would be performed by SCE technicians and/or contractors. All work would occur within existing or proposed substations or buildings. Anticipated telecommunication construction personnel and equipment are summarized in Table 3.2-2.

3.2.4.2 Fiber Optic Telecommunication Cable Route

The approximately 58-mile long fiber optic telecommunication line would be constructed in segments, as illustrated on Figures 3.1-9 through 3.1-15.

Segment 1, approximately 18 miles in length, is located between Ridgecrest Service Center and Searles Substation. This segment would be constructed as follows:

> At the Ridgecrest Service Center telecommunications room, proceed east, trenching approximately 20 feet and installing new underground substructure. Fiber optic telecommunication cable would then be installed through the new underground substructure. Proceeding north, the trenching and installation of the underground substructure and telecommunication cable would continue for approximately 145 feet to Upjohn Avenue. Thereafter, the work would proceed east, approximately 80 feet to Lenore Street. From Lenore Street, the work would proceed north, approximately 1,335 feet to East Church Avenue. From East Church Avenue, the work would proceed east to pole No. 1646432E. At this point, a riser would be installed on pole No. 1646432E. The fiber optic telecommunication cable would be routed up through the riser, and then would be installed on existing overhead structures. The fiber optic telecommunication cable route then would follow the Inyokern-Searles-McGen No. 2 115 kV subtransmission pole line ROW eastward to pole No. 4100476E. At pole No. 4100476E, a riser would be installed, allowing the fiber optic telecommunication cable to route down into the underground substructure that would be constructed, continuing northeast approximately 225 feet into the MEER at Searles Substation.

Segment 2, approximately six miles in length, is located between Searles Substation and McGen Substation. This segment would be constructed as follows:

> At Searles Substation, starting at the MEER, proceed north, trenching approximately 200 feet and installing new underground substructures. Fiber optic telecommunication cable would then be installed through the new underground substructure. Proceeding west, the trenching and installation of the underground substructure and telecommunication cable would continue for approximately 200 feet to pole No. 4100473E. At this point, a riser would be installed on pole No. 4100473E. The fiber optic telecommunication cable would be routed up through the riser and then would be installed on existing overhead structures. The fiber optic telecommunication cable route then would follow the Inyokern-Searles-McGen No. 2 115 kV subtransmission pole line ROW northward to pole No. 4100352E. At pole No. 4100352E, a riser would be installed, allowing the fiber optic telecommunication cable to route down into the underground substructure that would be constructed. Proceeding northeast, the trenching and installation of the underground substructure and telecommunication cable would continue for approximately 375 feet to the McGen Substation property line. Trenching and installation of the underground substructure and telecommunication cable would continue northwest approximately 56 feet, then continue northeast for approximately 255 feet. The trenching and installation of the underground substructure and telecommunication cable would continue southeast for approximately 165 feet into the McGen Substation MEER.

Segment 3, approximately five miles in length, is located between McGen Substation and Searles Substation. This segment would be constructed as follows:

> At McGen Substation, starting at the MEER, proceed west, trenching approximately 675 feet and installing new underground substructures. Fiber optic telecommunication cable would then be installed through the new underground substructure to pole No. 4100509E. At this point, a riser would be installed on pole No. 4100509E. The fiber optic telecommunication cable would be routed up through the riser, and then would be installed on existing overhead structures, and would follow the Inyokern-Searles-McGen No. 1 115 kV subtransmission pole line ROW southward to pole No. 4100501E. At pole No. 4100501E, a riser would be installed, allowing the fiber optic telecommunication cable to route down into the underground substructure that would be constructed. The trenching and installation of the underground substructure and telecommunication cable would continue westward for approximately 390 feet. The trenching and installation of the underground substructure and telecommunication cable would continue south approximately 50 feet into the Searles Substation MEER.

Segment 4, approximately 29 miles in length, is located between Searles Substation and Inyokern Substation. This segment would be constructed as follows:

> At Searles Substation, starting at the MEER, proceed south, trenching approximately 85 feet and installing new underground substructures. Fiber optic telecommunication cable would then be installed through the new underground substructure. Proceeding east, the trenching and installation of the underground substructure and telecommunication cable would continue for approximately 395 feet to pole No. 4100503E. At this point, a riser would be installed on pole No. 4100503E. The fiber optic telecommunication cable would be routed up through the riser, and then would be installed on existing overhead structures, and would follow the Inyokern-Searles-McGen No. 1 115 kV subtransmission pole line ROW westward to pole No. A1533036AE. At pole No. A1533036AE, the fiber optic telecommunication cable would be installed on existing overhead structures, and would follow the Inyokern-Searles-McGen No. 1 115 kV subtransmission pole line ROW northward to pole No. 1663740E. At pole No. 1663740E, a riser would be installed, allowing the fiberr optic telecommunication cable to route down into the underground substructure that would be constructed. Proceeding northeast, the trenching and installation of the underground substructure and telecommunication cable would continue for approximately 1,000 feet, under Highway 178 and into the Inyokern Substation MEER.

The existing ISRSC cable, approximately 10 miles in length, would be tapped twice to effectively loop the fiber optic telecommunication cable through the new Downs Substation MEER, as follows:

> The first cable tap would splice into the existing ISRSC fiber optic telecommunication cable at pole No. 1646400E. At pole No. 1646400E, a riser would be installed, allowing the fiber optic telecommunication cable to route down into the underground substructure that would be constructed. Proceeding southwest, trenching and installation of the underground substructure and telecommunication cable would continue for approximately 150 feet into Downs Substation and into the new Downs Substation MEER.
>
> The second cable tap would exit the Downs Substation MEER through new and existing portions of the substation control cable trench. Proceeding east, the fiber optic telecommunication cable would be routed through the substation control cable trench for approximately 225 feet. Proceeding southeast, the fiber optic telecommunication cable would be routed through existing 1- to 5-inch diameter polyvinyl chloride (PVC) conduit for approximately 150 feet to pole No. 1646404E. At pole No. 1646404E, the fiber optic telecommunication cable would be routed through an existing riser and splice into the existing ISRSC fiber optic telecommunication cable.

3.2.4.3 Fiber Optic Telecommunication Cable Construction Activities

The proposed fiber optic telecommunication cable construction would utilize an All-Dielectric Self-Supporting (ADSS) 48 strand single mode fiber optic telecommunication cable. Approximately 58 miles of new fiber optic telecommunication cable would be installed. Portions of the fiber optic telecommunication cable would be constructed on existing overhead distribution and transmission wood and LWS poles. In addition, portions of the cable would be constructed on new overhead structures and newly constructed underground conduit system(s), subject to determination through final engineering.

The fiber optic telecommunication cable would be attached to existing overhead pole structures utilizing a five-foot wood cable arm and high-strength engineered dielectric suspension support block. This suspension support block is oriented vertically and attached to the cable arm. One support block per overhead structure would be required. For the installation in the new underground conduit and underground structures, the fiber optic telecommunication cable would utilize a high density polyethylene smooth wall inner-duct which provides protection and identification for the cable. The fiber optic telecommunication cable and inner-duct would be installed in and throughout the length of the new underground conduit structure within 5-inch diameter schedule 40 PVC. The underground conduit structures would be excavated by backhoe or by manually excavating a trench approximately 18 inches wide and 36 inches deep. The 5-inch diameter schedule 40 PVC conduit would be placed in the open trench, encased with slurry, covered with back-filled material, and then compacted.

The construction of the fiber optic telecommunication cable would utilize the franchise area and existing transmission access roads. Lane closure permits within the franchise area would be obtained, as necessary, from the applicable local government jurisdictions. Construction activities requiring major street use would be scheduled in accordance with applicable local ordinances. For purposes of fiber optic telecommunication cable stringing, the existing and new overhead structures which do not have vehicle access would be approached by the construction crew on foot.

Fiber optic telecommunication cable stringing includes all activities associated with the installation of cables onto the overhead poles. This activity includes the installation of vibration dampers, and suspension and dead-end hardware assemblies. Stringing sheaves (rollers or travelers) are attached during the framing process. A standard wire stringing plan includes a sequenced program of events starting with determination of cable pulls and cable pulling equipment set-up positions. Advanced planning would be done by experienced crew foremen who would determine pulling locations, times, and safety protocols needed to ensure that the installation of fiber optic telecommunication cable is accomplished correctly. Typically, fiber optic telecommunication cable pulls occur every 6,000 feet to 10,000 feet on flat and mountainous terrain. Fiber optic telecommunication cable splices are required at the end and beginning of each cable pull.

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

The proposed overhead fiber optic telecommunication cable construction method may be summarized using the following five steps:

Step 1. Develop a cable-stringing plan to determine the sequence of cable pulls and the set-up locations for the cable pull/tensioning/splicing equipment.

Step 2. A bucket truck would be used to install a five-foot cable arm and a high-strength engineered dielectric suspension support block to the overhead pole structure. At pole locations where it is not feasible to use a bucket truck, the construction crew would walk up and climb the pole.

Step 3: Threading. A bucket truck would be used to install a lightweight nylon rope line from structure to structure. At pole locations where it is not feasible to use a bucket truck, the construction crew would walk up and climb the pole. The nylon rope line would be threaded through the suspension support block. This threading process would continue between all structures of a particular set of spans selected for the cable pull.

Step 4: Pulling. The nylon rope line would be attached to the fiber optic telecommunication cable and, using the specified cable tension, a pull would occur through all structures of a particular set of spans selected for the cable pull.

Step 5: Splicing. After the fiber optic telecommunication cable has been pulled in, each cable pull section would be spliced together. Once the splicing has been completed, slack fiber optic telecommunication cable used in the splicing process would be coiled to the overhead structure or laced to the fiber optic telecommunication cable spans.

The proposed laydown area for fiber optic telecommunication cable construction activities would be at the Ridgecrest Service Center. If approved, the crews would utilize Ridgecrest Service Center as a laydown area for all material for the proposed fiber optic telecommunication cable, which would be delivered by truck. Material would be placed inside the perimeter of the fenced Ridgecrest Service Center in a designated area during construction. The majority of the truck traffic would use major streets and would be scheduled for off-peak traffic hours. All construction debris would be placed in appropriate on-site containers and periodically disposed of off site in accordance with all applicable regulations of the local jurisdiction.

3.2.4.4 Telecommunication Equipment Construction Schedule and Typical Construction Equipment

The telecommunication equipment installation at the previously mentioned existing SCE locations would require approximately 99 man-days to complete. Technician crew size would vary depending on final project schedule timelines. Anticipated telecommunication construction personnel and equipment are summarized below in Table 3.2-2.

Table 3.2-2 Telecommunication Construction Personnel and Equipment

Construction Element	Number of Man-days	Equipment Requirements Location	
Equipment / Circuit installation	15	1 – Van or Truck, (1 Ton – Gas) per two technicians	Inyokern Substation
Equipment / Circuit installation	23	1 – Van or Truck, (1 Ton – Gas) per two technicians	Downs Substation
Equipment / Circuit installation	15	1 – Van or Truck, (1 Ton – Gas) per two technicians	Ridgecrest Service Center
Equipment / Circuit installation	23	1 – Van or Truck, (1 Ton – Gas) per two technicians	Searles Substation
Equipment / Circuit installation	23	1 – Van or Truck, (1 Ton – Gas) per two technicians	McGen Substation

3.2.4.5 Fiber Optic Telecommunication Cable Construction Schedule and Typical Construction Equipment

The Proposed Project fiber optic telecommunication cable construction would require approximately 300 man-days or 60 crew days (5-man crew) to complete. Construction would be performed by SCE ECS construction crews and/or contractors. Anticipated fiber optic telecommunication cable construction personnel and equipment are summarized below in Table 3.2-3.

Table 3.2-3 Fiber Optic Telecommunication Cable Construction Personnel and Equipment

Construction Element	Number of Personnel	Equipment Requirements	
Cable Construction	5	2 – Bucket Trucks (Diesel) 1 – Pick-up (Diesel) 2 – Cable Dollies	1 – Single Drum Puller (Diesel) 1 – 2 Axle Trailer
Receive and Load Out Materials	5	1 – 5-Ton Forklift (Diesel) 1 – Pick-up (Diesel)	
Cleanup	5	2 – Bucket Trucks (Diesel) 1 – Pick-up (Diesel)	

3.3 Land Disturbance

Land disturbance for the Proposed Project would include surface modifications for the installation of access roads, 115 kV subtransmission lines, fiber optic telecommunication cable, and the substation. It is estimated that the total permanent land disturbance for the Proposed Project would be 3.3 acres. The estimated amount of land disturbance (including temporary disturbance) for each project feature is summarized below in Table 3.3-1.

Table 3.3-1 Estimated Land Disturbances

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acres Disturbed during Construction	Acres to be Restored	Acres Permanently Disturbed
Substation Construction					
Substation	1	NA	2.6	0.0	2.6
Staging Yard	1	200’ x 200’	0.9	0.9	0.0
Substation Subtotal (6)			**3.5**	**0.9**	**2.6**
115 kV Subtransmission Line Construction					
Guard Structures	6	75’ x 50’	0.5	0.5	0.0
Replace Existing 115 kV Wood Pole with New 115 kV Light Weight Steel Pole (1 & 2)	1	150' x 75'	0.3	0.3	0.0
Replace Existing 115 kV Wood Pole with New 115 kV Wood Pole (1 & 2)	6	150’ x 75’	1.5	1.5	0.0
Reframe Existing 115 kV Wood Pole (1)	1	150’ x 75’	0.3	0.3	0.0
Install New 115 kV Tubular Steel Pole (3)	5	200’ x 100’	2.3	2.0	0.3
Install New 115 kV Light Weight Steel Pole (3)	1	150’ x 75’	0.26	0.25	0.01
Install New Wood Stub Pole (3)	2	75’ x 50’	0.172	0.166	0.006
Top Off Existing 115 kV Wood Pole (1)	4	150' x 75'	1.0	1.0	0.0
Conductor / GW Stringing Setup Area – Puller (4)	3	300' x 100'	2.1	2.1	0.0
Conductor / GW Stringing Setup Area – Tensioner (4)	4	400' x 100'	3.7	3.7	0.0
New Access Roads on Expanded Downs Substation Location (5)	1	0.2 linear miles x 18’ wide	0.4	0.0	0.4
Material and Equipment Staging Yard (TBD)	1	approximately 2.5 acres	2.5	2.5	0.0

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acres Disturbed during Construction	Acres to be Restored	Acres Permanently Disturbed
Subtransmission Subotal (6)			**15.0**	**14.3**	**0.7**
Conduit for Fiber Optic Telecommunication Cable (7, 8, 9)					
Trench, 18" wide, for conduit from pole #4100476E to Searles Substation	1	225’ x 50’	0.3	0.3	0.0
Trench, 18" wide, for conduit from pole #4100473E to Searles Substation	1	400’ x 50’	0.5	0.5	0.0
Trench, 18" wide, for conduit from pole #4100352E to McGen Substation	1	851’ x 50’	1.0	1.0	0.0
Trench, 18" wide, for conduit from pole #4100509E to McGen Substation	1	675’ x 50’	0.8	0.8	0.0
Trench, 18" wide, for conduit from pole #4100501E to Searles Substation	1	440’ x 50’	0.5	0.5	0.0
Trench, 18" wide, for conduit from pole #4100502E to Searles Substation	1	480’ x 50’	0.6	0.6	0.0
Trench, 18" wide, for conduit from pole #1663740E to Inyokern Substation	1	1000’ x 50’	1.1	1.1	0.0
Fiber Optic Telecommunications Cable Subtotal			**4.7**	**4.7**	**0.0**
Proposed Project Total			**23.2**	**19.9**	**3.3**

Notes:

All data provided in this table are based on planning level assumptions and may change following completion of more detailed engineering, identification of field conditions, availability of material and equipment, and any environmental and/or permitting requirements.

1. Includes the removal of existing conductor, teardown, and top off/removal of the existing structure.
2. Includes area needed for temporary conductor transfer, structure and/or conductor removal, and splicing new conductor; area to be restored after construction.

3. Includes foundation installation, structure assembly and erection, conductor and/or OHGW installation; area to be restored after construction: Portion of ROW within 25' of a Tubular Steel Pole or 10' of a Light Weight Steel Pole to remain cleared of vegetation and would be permanently disturbed (approximately 0.06 acre/TSP and 0.01 ac/LWS).
4. Based on 6,000’ conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles multiplied by road width of 14’ with a 2' shoulder on each side of road.
6. The disturbed acreage calculations are estimates based upon SCE’s preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access road information; they are subject to revision based upon final engineering and review of the project by SCE's Construction Manager and/or Contractor awarded project.
7. Trench 18" wide by 36" deep.
8. Width of calculated area based on use of backhoe, cement slurry truck, personnel, and soil spoils.
9. The disturbed acreage calculations are estimates based on preferred area of use from the described project features. A smaller area of acreage may be possible one final design is complete.

kV = kilovolt

ROW = right-of-way

TBD = To be determined

Table 3.3-2 below provides the approximate area of land disturbance at Downs Substation within the proposed fence, and the approximate volumes and types of earth materials that would be used or disposed.

Table 3.3-2 Substation Materials and Estimated Volumes

Element	Material	Approximate Volume (cubic yards)
Substation Equipment Foundations	Concrete	600
Equipment and cable trench excavations*	Soil	1,000
Cable Trenches**	Concrete	25
Internal Driveway	Asphalt concrete Class II aggregate base	420 850
Substation Rock Surfacing	Rock, nominal ¾ to 1 inch per SCE Standard	2,500

Notes:

* Excavation “spoils” would be placed on location during the below-ground construction phase and used to the extent possible for the required on-location grading.

** Standard cable trench elements are factory fabricated, delivered to the location, and installed by crane. Intersections are cast in place concrete.

3.4 Hazards and 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 (MSDS) would be made available to all crew workers at the construction site.

The SWPPP prepared for the Proposed Project would provide the locations for storage of hazardous materials during construction, as well as protective measures, notifications, and cleanup requirements for an incidental spills or other potential releases of hazardous materials.

3.5 Waste Management

Construction of the Proposed Project would result in the generation of various waste materials that can be recycled and salvaged. Waste items and materials would be collected by construction crews and separated into roll-off boxes at the staging yards (Figure 3.2-1). All waste materials that are not recycled would be categorized by SCE in order to assure appropriate final disposal. Non-hazardous waste would be transported to local waste management facilities. There is one waste management facility located within 4.5 miles of the Downs Substation location and four additional waste management facilities located within a 50-mile radius of Downs Substation.

Soil excavated for the Proposed Project would either be used as fill or disposed of at an appropriately licensed off-site facility.

3.6 Geotechnical Studies

Prior to the start of construction, SCE would conduct a geotechnical evaluation of the proposed Downs Substation location and the 115 kV subtransmission line segments. The geotechnical studies would include an evaluation of the water table depth, evidence of faulting, liquefaction potential, physical properties of subsurface soils, soil resistivity, slope stability, and the presence of hazardous materials.

3.7 Biological and Cultural Surveys

SCE has conducted initial biological and cultural evaluations (Sections 4.4 and 4.5) and would conduct further focused environmental surveys after project approval, but prior to the start of construction. These surveys would identify and/or address any potential sensitive biological and cultural resources in the vicinity of the Proposed Project, including the 115 kV subtransmission line routes, telecommunications routes, wire stringing locations, access roads, and staging yards.

Where feasible, the information gathered from these surveys may be used to finalize project design in order to avoid sensitive resources or to minimize the potential impact to sensitive resources from project-related activities. The results of these surveys would also determine the extent to which environmental specialist construction monitors would be required.

The following environmental surveys would be conducted prior to construction:

- Protocol-level Mohave ground squirrel surveys
- Protocol-level desert tortoise surveys
- Sensitive plant surveys
- Plant community mapping and habitat assessment

If sensitive biological or cultural resources are identified in preconstruction surveys, minimization or avoidance measures would be implemented. If avoidance is not feasible, SCE would work with the appropriate agencies to determine the measures that would minimize the potential impacts to sensitive biological and cultural resources.

3.8 Worker Environmental Awareness Program (WEAP)

Prior to construction, a WEAP would be developed based on the final engineered design, the results of pre-construction surveys, and a list of measures, if any, developed by the CPUC to reduce significant environmental effects of the Proposed Project. A presentation would be prepared by SCE project personnel prior to the commencement of work. A record of all trained personnel would be kept by the construction foreman.

In addition to instruction on compliance with any additional location-specific biological or cultural resources protective measures and project 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 Proposed Project (archaeologist, biologist, environmental coordinator, and regional spill response coordinator).
- Instruction on the Eastern Kern County Air Pollution Control District (EKCAPCD) and Mojave Desert Air Quality Management District (MDAQMD) Fugitive Dust and Ozone Precursor Control Measures.

- Instruction on what typical cultural resources look like; that if discovered during construction, work is to be suspended in the vicinity of any find; and the foreman and archaeologist or environmental coordinator are to be contacted for further direction.

- Instruction on what typical biological resources look like; that if discovered during construction, work is to be suspended in the vicinity of any find; and the site foreman and biologist or environmental coordinator are to be contacted for further direction.

- Instruction on the individual responsibilities under the Clean Water Act, the 2009 CGP, the project SWPPP, and the location of MSDS information for the project.

- Instructions to notify the foreman and regional spill response coordinator in case of hazardous materials spills and leaks 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 Proposed Project.

3.9 Construction Equipment and Personnel

The estimated elements, materials and number of personnel and equipment required for construction of the Proposed Project are summarized below in Table 3.9-1.

Construction would be performed by either SCE construction crews or contractors. Contractor construction personnel would be managed by SCE construction management personnel. SCE anticipates a total of approximately 15 to 25 construction personnel working on any given day. SCE anticipates that crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would be dependent upon local jurisdiction permitting, material availability, and construction scheduling.

In general, construction efforts would occur in accordance with accepted construction industry standards.

Table 3.9-1 Construction Equipment and Workforce Estimates by Activity

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Work-force	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Survey (1)				**4**	**2**		**2 Miles**
1-Ton Truck, 4x4	300	Gas	2		2	8	1 Mile/Day
Temporary Equipment & Material Staging Area (2)				**4**			
1-Ton Truck, 4x4	300	Gas	1		Duration of Project	2	
Boom/Crane Truck	350	Diesel	1			4	
Water Truck	300	Diesel	1			8	
R/T Forklift	125	Diesel	1			6	
Truck, Semi, Tractor	400	Diesel	1			2	
Roads & Landing Work (3)				**5**	**3**		**0.2 Miles & 14 Pads**
1-Ton Truck, 4x4	300	Gas	1		3	2	1 Mile/Day & 7 Pads/Day
Motor Grader	250	Diesel	1		2	4	
Water Truck	300	Diesel	1		3	8	
Backhoe/Front Loader	125	Diesel	1		3	6	
Drum Type Compactor	100	Diesel	1		2	4	
Track Type Dozer	150	Diesel	1		2	4	
Lowboy Truck/Trailer	450	Diesel	1		3	2	
Guard Structure Installation (4)				**6**	**2**		**6 Structures**
3/4-Ton Truck, 4x4	275	Gas	1		2	4	4 Structures/ Day
1-Ton Truck, 4x4	300	Gas	1		2	4	
Compressor Trailer	60	Diesel	1		2	6	
Manlift/Bucket Truck	250	Diesel	1		2	6	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Work-force	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Boom/Crane Truck	350	Diesel	1		2	8	
Auger Truck	210	Diesel	1		2	4	
Extendable Flat Bed Pole Truck	400	Diesel	1		2	8	
Remove Existing Conductor (5)				**14**	**1**		**0.1 Circuit Miles**
1-Ton Truck, 4x4	300	Gas	2		1	8	0.3 Mile/Day
Manlift/Bucket Truck	250	Diesel	2		1	8	
Boom/Crane Truck	350	Diesel	2		1	6	
Bull Wheel Puller	350	Diesel	1		1	6	
Static Truck/ Tensioner	350	Diesel	1		1	6	
Lowboy Truck/ Trailer	450	Diesel	2		1	4	
Wood Pole Removal / Top-Off (6)				**6**	**2**		**11 Poles**
1-Ton Crew Cab, 4x4	300	Gas	2		2	5	8 Poles/Day
Boom/Crane Truck	350	Diesel	1		2	4	
Manlift/Bucket Truck	250	Diesel	1		2	6	
Compressor Trailer	60	Diesel	1		2	6	
Flat Bed Pole Truck	400	Diesel	1		2	8	
Light Weight Steel / Wood Pole Haul (7)				**4**	**2**		**2 LWS & 7 Wood Poles**
1-Ton Truck, 4x4	300	Gas	1		2	4	6 Poles/Day
Boom/Crane Truck	350	Diesel	1		2	6	
Flat Bed Pole Truck	400	Diesel	1		2	8	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Work-force	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Light Weight Steel / Wood Pole Assembly (8)				**8**	**3**		**2 LWS & 7 Wood Poles**
3/4-Ton Truck, 4x4	275	Gas	2		3	4	4 Poles/Day
1-Ton Truck, 4x4	300	Gas	2		3	4	
Compressor Trailer	60	Diesel	1		3	8	
Boom/Crane Truck	350	Diesel	1		3	6	
Light Weight Steel / Wood Pole Erection (9)				**8**	**3**		**2 LWS & 7 Wood Poles**
3/4-Ton Truck, 4x4	275	Gas	2		3	4	4 Poles/Day
1-Ton Truck, 4x4	300	Gas	2		3	4	
Compressor Trailer	60	Diesel	1		3	8	
Boom/Crane Truck	350	Diesel	1		3	6	
Install Tubular Steel Pole Foundations (10)				**7**	**10**		**5 TSPs**
3/4-Ton Truck, 4x4	275	Gas	2		10	4	0.5 TSP/Day
Boom/Crane Truck	350	Diesel	1		10	5	
Backhoe/Front Loader	125	Diesel	1		10	6	
Auger Truck	210	Diesel	1		6	6	
Water Truck	300	Diesel	1		10	8	
Dump Truck	350	Diesel	1		10	6	
Concrete Truck	350	Diesel	3		6	3	
Tubular Steel Pole Haul (11)				**4**	**2**		**5 TSPs**
3/4-Ton Truck, 4x4	275	Gas	2		2	4	3 TSPs/Day
Boom/Crane Truck	350	Diesel	1		2	6	
Flat Bed Pole Truck	400	Diesel	1		2	8	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Work-force	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Tubular Steel Pole Assembly (12)				**8**	**5**		**5 TSPs**
3/4-Ton Truck, 4x4	275	Gas	2		5	4	1 TSP/Day
1-Ton Truck, 4x4	300	Gas	2		5	4	
Compressor Trailer	60	Diesel	1		5	8	
Boom/Crane Truck	350	Diesel	1		5	6	
Tubular Steel Pole Erection (13)				**8**	**5**		**5 TSPs**
3/4-Ton Truck, 4x4	275	Gas	2		5	4	1 TSP/Day
1-Ton Truck, 4x4	300	Gas	2		5	4	
Compressor Trailer	60	Diesel	1		5	6	
Boom/Crane Truck	350	Diesel	1		5	8	
Install Conductor (14)				**20**	**2**		**0.2 Circuit Miles**
1-Ton Truck, 4x4	300	Gas	2		2	8	0.10 Mile/Day
Wire Truck/Trailer	350	Diesel	2		2	2	
Dump Truck	350	Diesel	1		2	2	
Manlift/Bucket Truck	250	Diesel	4		2	2	
Boom/Crane Truck	350	Diesel	1		2	6	
Sock Line Puller	300	Diesel	1		2	6	
Bull Wheel Puller	350	Diesel	1		2	6	
Static Truck/ Tensioner	350	Diesel	1		2	6	
Backhoe/Front Loader	125	Diesel	1		2	2	
Lowboy Truck/Trailer	450	Diesel	2		2	2	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Work-force	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Guard Structure Removal (15)				**6**	**1**		**6 Structures**
3/4-Ton Truck, 4x4	275	Gas	1		1	4	6 Structures/ Day
1-Ton Truck, 4x4	300	Gas	1		1	4	
Compressor Trailer	60	Diesel	1		1	6	
Manlift/Bucket Truck	250	Diesel	1		1	8	
Boom/Crane Truck	350	Diesel	1		1	8	
Extendable Flat Bed Pole Truck	400	Diesel	1		1	8	
Restoration (16)				**7**	**2**		**1 Miles**
1-Ton Truck, 4x4	300	Gas	2		2	2	0.5 Mile/Day
Motor Grader	250	Diesel	1		2	6	
Water Truck	300	Diesel	1		2	8	
Backhoe/Front Loader	125	Diesel	1		2	6	
Drum Type Compactor	100	Diesel	1		2	6	
Lowboy Truck/Trailer	450	Diesel	1		2	3	

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 Guard Structure Installation = one 6-man crew
#5 Remove Existing Conductor = one 14-man crew
#6 Remove Existing LSTs = one 8-man crew
#7 Remove Existing LST Foundations = one 4-man crew

#8 LWS/Wood Pole Haul = one 4-man crew
#9 LWS/Wood Pole Assembly = one 8-man crew
#10 LWS/Wood Pole Erection = one 8-man crew
#11 Install Foundations for Tubular Steel Poles = one 7-man crew
#12 Tubular Steel Pole Haul = one 4-man crew
#13 Tubular Steel Pole Assembly = one 8-man crew
#14 Tubular Steel Pole Erection = one 8-man crew
#15 Conductor Installation = one 20-man crew
#16 Guard Structure Removal = one 6-man crew
#17 Restoration = one 7-man crew

3.10 Construction Schedule

SCE anticipates that construction of the Proposed Project would take approximately nine months. Construction would commence following CPUC approval, final engineering, and procurement activities. Construction is anticipated to commence after a decision is issued by the CPUC. In order to meet the June 2014 operating date, construction would be required to start in August 2013 and would last through May 2014.

3.11 Project Operation

Downs Substation would be unattended and electrical equipment within the proposed Downs Substation would be remotely monitored and controlled by an automated system from SCE's Lugo Switching Center. SCE personnel would visit for electrical switching and routine maintenance purposes. Routine maintenance would include equipment testing, monitoring, and repair. SCE personnel would generally visit the proposed Downs Substation three to four times per month.

The new 115 kV subtransmission lines would be maintained in a manner consistent with CPUC General Order No. 165. Normal operation of the 115 kV subtransmission lines would be controlled remotely through SCE control systems.

SCE maintains an inspection frequency of the energized 115 kV subtransmission overhead facilities a minimum of once per year via ground and/or aerial observation. The frequency of inspection and maintenance activities would depend upon weather effects and any unique problems that may arise due to such variables as substantial storm damage or vandalism.

Maintenance activities include repairing conductors, replacing insulators, replacing poles, and access road maintenance.