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Acronyms and Abbreviations

ACSR/AW	Aluminum Conductor Steel Reinforced/AW Core
ACSS/AW	Aluminum Conductor Steel Supported/AW Core
APMs	applicant-proposed measures
BMPs	Best Management Practices
CAISO	California Independent System Operator
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
G.O.	General Order
ILA	incidental landing areas
kV	kilovolt
MCM	thousand circular mils
NCCP	Natural Community Conservation Plan
NERC	North American Electric Reliability Corporation
OPGW	optical ground wire
PEA	Proponent's Environmental Assessment
PTC	Permit to Construct
PVC	polyvinyl chloride
ROW	right-of-way
SDG&E	San Diego Gas and Electric Company
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TPP	Transmission Planning Process
UXO	unexploded ordnance

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3. PROJECT DESCRIPTION

San Diego Gas and Electric Company (SDG&E) is a regulated public utility that provides electric and natural gas service to approximately 3.4 million consumers within an approximately 4,100-square-mile service area, covering 25 communities and many unincorporated areas within San Diego County and Southern Orange County.

This chapter defines the Proposed Project's location, objectives, and components; describes the existing electric system; and explains how the Proposed Project would be implemented. This chapter also identifies any permits or other approvals that may be needed to implement the Proposed Project. Finally, this chapter identifies any measures proposed by SDG&E to avoid or minimize potential environmental impacts.

The California Public Utilities Commission (CPUC) will be the lead agency for the Proposed Project under the California Environmental Quality Act (CEQA). SDG&E is submitting this Proponent's Environmental Assessment (PEA) (Volume II of II) in support of its Application (Volume I of II) for a Permit to Construct (PTC).

3.1 PROJECT LOCATION

SDG&E requests approval of the Proposed Project to ensure the reliability of the transmission system, meet State of California policy goals, accommodate load growth, and improve system efficiency in SDG&E's service territory. In this effort, SDG&E proposes construction and reconductoring/re-energizing of approximately 12 miles of 69 kilovolt (kV) overhead electric power line from the existing San Marcos Substation to the existing Escondido Substation. The Proposed Project would be a combination of new overhead single-circuit electric power line structures, rebuild of existing structures from single circuit to double circuit, and reconductoring and re-energizing of existing conductors.

As shown in Figure 3-1: Project Location Map, components of the Proposed Project are located in the cities of Carlsbad, Escondido, Vista, and San Marcos, as well as unincorporated San Diego County, in San Diego County, California. The Proposed Project also has two auxiliary existing staging yards in the City of San Diego that may be utilized for the Proposed Project. Two poles will be removed from service (RFS) and two poles will have overhead work on the border of the City of San Marcos and the City of Vista. The proposed power line would be constructed and/or rebuilt within SDG&E right-of-way (ROW), collocated with existing utility infrastructure, with minimal new ROW required. The Proposed Project starts from SDG&E's existing San Marcos Substation in the west and terminates at SDG&E's existing Escondido Substation in the east. The area including the Proposed Project components—the existing utility corridor, the new ROW, the staging yards, stringing sites, and all associated access roads—is identified throughout this PEA as the "Proposed Project Area."

The Proposed Project includes the following components, broken out by segment:

- Segment 1 Rebuild: Rebuild of approximately 2.0 miles of an existing 69 kV circuit power line near San Marcos Substation.
- Segment 2 New Build: Addition of approximately 2.8 miles of a new single-circuit 69 kV overhead power line from the end of Segment 1 to the existing Meadowlark Junction.
- Segment 3 Reconductoring/Re-Energizing: Reconductoring approximately 7.4 miles of a de-energized power line segment to the existing Escondido Substation. Segment 3 includes minor work at the existing Escondido Substation to accommodate this new circuit.

The locations of these Proposed Project segments are depicted in Figure 3-1: Project Location Map, and Figure 3-2: Project Overview Map, and are described in more detail in subsequent sections.

3.2 EXISTING SYSTEM

3.2.1 Existing Transmission Alignment

As shown in Figure 3-1: Project Location Map, and Figure 3-2: Project Overview Map, the Proposed Project is located in the North County portion of San Diego County, California, in portions of the Cities of Carlsbad, Escondido, Vista, and San Marcos as well as in unincorporated San Diego County. The City of Carlsbad is 1.85 miles from San Marcos Substation, and the City of Vista is approximately 2 miles from San Marcos Substation; the Proposed Project is approximately 25 miles north of downtown San Diego. The Proposed Project would be collocated with existing power lines in SDG&E easements for most of the alignment, including portions of the existing TL 680C, TL 13811/13825, and portions of an existing de-energized 138 kV line, TL 13811A, which would be converted to 69 kV. Approximately 1.2 acres of new ROW would be required in Segment 1 to widen the existing ROW and accommodate the new structures. Permanent disturbance areas would be necessary for maintenance of the new power line and improvements to the existing utility infrastructure.

As shown in Figure 3-1: Project Location Map, the Proposed Project is situated south of Highway 78 and just west of Interstate 15. A portion of the Proposed Project traverses along San Marcos Boulevard and crosses Rancho Santa Fe Road as well as other local existing roadways. The power line would be constructed and/or rebuilt within SDG&E ROW, collocated with existing utility infrastructure, with minimal new ROW required. The areas in and around the Proposed Project include residential neighborhoods, industrial facilities, open space and preserves, commercial areas, and vacant lands. Figure 3-3: Existing System Configuration One-Line Diagram, depicts the existing system configuration and Figure 3-4: Proposed System Configuration One-Line Diagram, depicts the proposed system configuration.

3.2.2 Existing Substations

The existing San Marcos Substation is located on Discovery Street on the south side of Highway 78, within the City of San Marcos. The substation currently has two power lines accessing it; the

Proposed Project would create a third power line at that substation. The existing Escondido Substation is located southwest of the intersection of Highway 78 and Interstate 15, just north of Auto Park Way, within the City of Escondido. Escondido Substation currently has 11 power lines accessing the substation; the Proposed Project would create a twelfth power line at that substation.

3.3 PROJECT OBJECTIVES

The Proposed Project is intended to meet the following objectives:

1. Eliminate North American Electric Reliability Corporation (NERC) Category P0 (Cat A) and Category P1 (Cat B) violation on TL 684 (Escondido to San Marcos) and 680C (San Marcos–Melrose Tap).

2. Meet mandatory NERC reliability criteria in the Escondido Area Load Pocket and alleviate the existing 69 kV congestion at Escondido/San Marcos Substations.

A detailed description of the objectives of the Proposed Project can be found in Chapter 2, Project Purpose and Need.

3.4 PROJECT FACILITIES

The Proposed Project includes the rebuild, new build, and reconductoring/re-energizing of approximately 12 miles of 69 kV overhead electric power line from the existing San Marcos Substation to the existing Escondido Substation. In addition to improving the reliability to the area by adding a third line into San Marcos Substation, the Proposed Project would also mitigate identified NERC thermal/voltage violations and the ongoing 69 kV congestion on the corridor between Escondido to San Marcos Substations. In the 2013–2014 Transmission Planning Process (TPP), the Proposed Project was approved by the California Independent System Operator (CAISO). The Proposed Project was included in the 2013–2014 and 2015–2016 TPP. The “need” date for the Proposed Project was anticipated for June 2016.

The Proposed Project components are listed below, included in Table 3-1: Proposed Project Power Line Segments, depicted in Figure 3-2: Project Overview Map, and described in more detail in Section 3.5, Project Components.

Table 3-1: Proposed Project Power Line Segments

Segment No.[1]	Length (miles)	Description of Work
1. Rebuild	2.0	Rebuild of approximately 2.0-mile segment of an existing 69 kV circuit (TL 680C) from a single-circuit structure power line to a double-circuit structure power line, supporting both a reconductored TL 680C and proposed TL 6975. All wood structures would be replaced with steel poles, all porcelain insulators would be replaced with polymer insulators, and reconductoring would be required associated with the existing distribution underbuilt line. This rebuild portion of the Proposed Project is from the existing San Marcos Substation, along West San Marcos Boulevard (which turns into Palomar Airport Road), until it reaches an existing SDG&E corridor west of White Sands Drive. Segment 1 would require approximately 1.2 acres of new ROW where the existing ROW would be widened.
2. New Build	2.8	Addition of a new single-circuit 69 kV overhead power line segment, approximately 2.8 miles long, to be constructed on new steel poles adjacent to the existing TL 13811/13825 power line. Segment 2 of the Proposed Project would be entirely within the existing SDG&E corridor (approximately 50 feet east of the centerline of the existing structures) and extend from Palomar Airport Road west of White Sands Drive to Meadowlark Junction, which is located just north of San Elijo Road and Hidden Canyon Road. Additionally, at Meadowlark Junction, the existing 12 kV distribution line would be reconfigured with the Proposed Project.
3. Reconductoring/ Re-Energizing	7.4	From Meadowlark Junction to Escondido, the new power line would transition to existing steel lattice towers that contain a segment of overhead conductor that is currently de-energized. Segment 3 of the Proposed Project would be approximately 7.4 miles long and would involve reconductoring, re-energizing of existing conductor, and installation of hardware and insulators. The 250 thousand circular mils (MCM) copper conductor and porcelain insulators on the north side of the towers would be removed and replaced with polymer insulators and new 636 ACSS/AW conductor. The reconductoring would be between Meadowlark Junction and an existing structure on Harmony Grove Road near Kauana Loa Drive. From this point to Escondido Substation, the existing conductor would remain in place. Minor work at the existing Escondido Substation on relocated existing circuits would be required to accommodate this new circuit.
Notes: Table contents based on preliminary engineering and subject to change. [1] Refer to Figure 3-2: Project Overview Map, for segment locations.		

The Proposed Project includes the following main components:

- Removal of approximately 19 poles from service.
- Replacement of approximately 40 wooden power line poles with 40 dulled galvanized steel poles that would be direct-bury or supported by foundations.

- Installation of approximately 18 new steel dulled galvanized poles that would be either supported by foundations or direct-bury.
- Pole-top work for reconductoring/re-energizing at approximately 43 structures. Structures would not be replaced; however, two of these structures would have anchor work.
- Reconductoring near San Marcos Substation of the existing TL 680C 69 kV line with 636 Aluminum Conductor Steel Reinforced/AW Core (ACSR/AW).
- Stringing near San Marcos Substation for TL 6975 (would have 636 Aluminum Conductor Steel Supported/AW Core [ACSS/AW]).
- Reconductoring the existing distribution underbuild.
- Reconductoring near Meadowlark Junction of the existing lattice tower and steel pole line with 636 ACSS/AW conductor.
- One new access road and four spur roads will be installed.
- Road-extension work in one existing access road area to provide access to the new steel poles and distribution line area at Meadowlark Junction.
- Installation of approximately 50 temporary guard structures.
- Use of approximately 21 stringing sites (12 stringing sections).
- Potential use of 10 staging yards.
- Removal of an oil containment wall and a Circuit Breaker Pad at Escondido Substation.
- At Escondido Substation, existing circuits would be relocated to available bay positions.
- Installation of approximately 360 feet of primary and secondary underground conduit from new pole positions to intercept locations along existing conduit packages.
- At San Marcos Substation, a new Circuit Breaker Pad, seven piers, and an A-frame would be installed for the new line.
- Fifteen structures along the alignment were identified as not requiring work.
- Four structures were identified for possible work.

3.5 PROJECT COMPONENTS

3.5.1 Project Segments

SDG&E proposes the rebuild, new build, and reconductoring/re-energizing of approximately 12 miles of 69 kV overhead electric power line from the existing San Marcos Substation to the existing Escondido Substation. The Proposed Project would be a combination of rebuild of existing structures from single circuit to double circuit, new build of overhead single-circuit electric power line structures, and reconductoring and re-energizing of existing conductors. The new build and reconductored portions of the power line would be entirely within existing ROWs, with a small portion of the Segment 1 rebuild requiring approximately 1.2 acres of new ROW where the existing ROW would be widened. In the Segment 1 rebuild section, the existing distribution underbuilt line, currently co-located with the Proposed Project, would be reconductored, and, based on new pole positions, some trenching would be involved to intercept existing underground conduit and reroute the conduit to the new pole. At Meadowlark Junction, the existing distribution line would also be reconfigured and rerouted to the new pole locations, along with an extended access road. In the portion of the Proposed Project where the existing power line would be reconductored and re-energized, all modifications would occur on the existing structures.

The following provides a detailed description of the scope of work for each of the three segments of the Proposed Project.

3.5.1.1 Segment 1 Rebuild

(Rebuild an Existing Line from San Marcos Substation to Create a Double-Circuit 69 kV Line)

Segment 1 of the Proposed Project would consist of rebuild of approximately 2.0 miles of an existing 69 kV circuit (TL 680C) from a single-circuit structure line into a double-circuit structure line, supporting both the existing TL 680C and proposed TL 6975. All wood structures would be replaced with steel poles, all porcelain insulators would be replaced with polymer insulators, and TL 680C would be reconductored with 636 ACSR/AW. For the proposed TL 6975, 636 ACSS/AW would be strung. The line would be rebuilt from San Marcos Substation, along San Marcos Boulevard and Palomar Airport Road, until it reaches the existing 150-foot-wide SDG&E corridor, approximately 800 feet west of White Sands Drive. At that location, TL 680C would continue on its existing alignment north within the SDG&E corridor, and TL 6975 would split off to the south (Segment 2). The existing ROW would be widened to accommodate the new structures, for a total of 1.2 acres of new ROW. The existing distribution underbuilt would be reconductored. A portion of the existing line that has two 12 kV circuits on one level would be changed to two levels. The existing SDG&E and third party communication lines underbuilt in Segment 1 would be transferred to the new structures. There are existing cable poles along this line. Based on new pole positions, some trenching would be involved to intercept existing underground conduit and reroute the conduit to the new pole.

3.5.1.2 Segment 2 New Build

(New 69 kV Line into Meadowlark Junction within an Existing SDG&E Utility Corridor)

A new segment of single-circuit 69 kV overhead power line would be constructed on new steel poles in the existing SDG&E corridor. The new power line segment would be approximately 2.8 miles long, starting at the end of Segment 1, and traveling south to the existing Meadowlark Junction (north of San Elijo Road and Hidden Canyon Road), and be located adjacent to the existing TL 13811/13825 power line. The new single-circuit 69 kV steel poles would be constructed within the SDG&E corridor, approximately 50 feet east of centerline of the existing structures. All of the new steel poles would have graded access roads and access/maintenance pads associated with them in order to facilitate construction and provide long-term maintenance access. The existing access road would be extended and widened to provide access to the new steel poles. At Meadowlark Junction, the existing 12 kV distribution line would be reconfigured. Segment 2 can accommodate additional communication lines, but they will not be installed as part of the Proposed Project.

3.5.1.3 Segment 3 Reconductoring/Re-Energizing

(Reconductoring/Re-Energizing an Existing Line into Escondido Substation and Converting It to 69 kV)

From Meadowlark Junction to Escondido Substation, the new power line would transition to existing steel lattice towers that contain a segment of overhead conductor that is currently de-energized. Approximately 7.4 miles of reconductoring would be required for the de-energized segment that is on the existing lattice towers. The existing lattice tower and steel pole line contains conductor, hardware, and insulators on both sides of the double-circuit structures. For the Proposed Project, the 250 thousand circular mils (MCM) copper conductors and porcelain insulators on the north side of the towers would be removed and replaced with polymer insulators and new 636 ACSS/AW conductors. The reconductoring would be between Meadowlark Junction and a structure on Harmony Grove Road, approximately 500 feet east of Kauana Loa Drive. From this point to the Escondido Substation, the existing 900 ACSS/AW conductors would remain in place.

At Escondido Substation, existing overhead conductor would be transferred from the 138 kV rack to an existing 69 kV bay position within the substation for the new TL 6975. Three existing 69 kV circuits would be transferred to different bay positions to accommodate this new circuit and avoid power line crossings. The last overhead spans (drop spans) of existing power lines TL 6908, TL 6934, and TL 689 would be relocated to available bay positions. New steel poles and replacement guys and anchors would be required to accomplish these relocations. The Proposed Project would include these substation modifications, as addressed in Section 3.5.5, Substation Work.

Appendix 3-A: TL 6975 Detailed Power Line Route Map, and Appendix 3-B: TL 6975 Structure Detail Table, provide a list and map of all proposed new 69 kV poles by type, all poles to be removed (including replacements), and existing poles to be utilized in place. Drawings of the typical types of structures to be installed and removed are included in Appendix 3-C: Typical Structure Diagrams. The Proposed Project is based on preliminary engineering design and is subject to change based on final engineering design.

A summary of poles to be replaced is available in Table 3-2: Proposed Project Pole Summary (Approximate Value). The maximum pole height denotes the height of the pole only, while the maximum height above ground includes the height of the pole and the foundation, if applicable.

Table 3-2: Proposed Project Pole Summary (Approximate Value)

Pole Type	Approximate Quantity	Maximum Pole Height (feet)	Maximum Height Above Ground (feet)	Average Base Diameter at Grade (feet)	Average Tip Diameter (inches)
Segment 1 Rebuild					
Direct-Bury	25	99	101	2.5	*15*
Micropile Foundation	0	0	0	0	0
Pier Foundation	11	98	100	8	29
Remove from Service	10	41	43	N/A	N/A
Pole-Top Work	6	41	43	N/A	N/A
No Work	4	54.5	56.5	N/A	N/A
Racks	2	N/A	N/A	N/A	N/A
Segment 2 New Build					
Direct-Bury	5	86	88	2.5	15
Micropile Foundation	0	0	0	0	0
Pier Foundation	11	108	110	8	29
Pole-Top Work	1	N/A	85	N/A	N/A
No Work	4	83	85	N/A	N/A
Racks	0	N/A	N/A	N/A	N/A
Segment 3 Reconductoring/Re-Energizing					
Direct-Bury	1	41.1	43.1	2.5	15
Micropile Foundation	0	0	0	0	0
Pier Foundation	4	83	85	8	29
Remove from Service	9	72.5	74. 5	N/A	N/A
Existing Structure Re-Energize Conductors (No Work)	5	N/A	160	N/A	N/A
Pole-Top Work	36	116.3	118.3	N/A	N/A
No Work	7	138	140	N/A	N/A
Racks	5	N/A	N/A	N/A	N/A
Note: This table is preliminary and subject to change based on final engineering. Data from SDG&E GIS Shapefiles/Mapbook dated 05/10/2107 and the HAG table dated 04/20/2017.					

3.5.2 Power Line

The Proposed Project includes the rebuild, new build, and reconductoring/re-energizing of several types of power line poles and towers, including overhead structures and underground duct packages. Each facility being proposed for installation is briefly described in the following subsections. Two types of poles would be used for the Proposed Project: direct-bury dulled galvanized steel poles and engineered dulled galvanized steel poles supported by foundations. In Segment 1, the 69 kV steel poles would have a total of six transmission arms and two distribution arms. In Segment 2 the steel poles would be a post with insulators. The new power line would be on existing steel lattice towers in Segment 3. Segment 1 tangents and dead-ends would have three phases on both sides of the pole. Segment 2 tangents would have two phases on one side and one phase on the other. Please see Appendix 3-C: Typical Structure Diagrams, for drawings of typical structures. All new poles would be fabricated with dulled galvanized steel.

Existing wood poles would be completely removed and the holes backfilled with soils from the pole replacement. Soil would not be taken from the surrounding areas to fill the holes. If additional backfill material is required, clean, decomposed granite would be used to backfill the old pole holes. Excess soil from the new holes would be placed on top of the decomposed granite. In some cases, existing poles would be cut at ground level, and the remainder of the pole would be left in place to avoid impacts on sensitive resources.

Appendix 3-A: TL 6975 Power Line Route Map, and Appendix 3-B: TL 6975 Structure Detail Table, provide a list and map of all proposed new 69 kV poles by type, all poles to be removed (including replacements), and existing poles to be utilized in place.

3.5.3 Poles/Towers

In general, the new 69 kV steel poles (direct-bury and foundation) would range in height from approximately 50 to 110 feet height above ground level. The tallest 69 kV structure would stand approximately 110 feet above the ground surface. The pole-top diameter can vary from 12 to 24 inches. The average existing height above ground is approximately 71.5 feet; the new average overall height above ground would be approximately 80.8 feet, which would be an approximate 15.4-foot average overall height increase to allow for increased vertical spacing between conductors. The anticipated maximum pole height increase would be approximately 44.0 feet for the overall Proposed Project, excluding the new poles on the power line. All poles would be constructed to design standards for avian protection.

3.5.3.1 Direct-Bury Steel Poles

Direct-bury steel poles are light- and heavy-duty weathering steel poles that are secured using a concrete backfill. Direct-bury steel poles would require an approximate 35- by 50-foot work area to provide a safe and adequate temporary workspace, including a temporary work area in the access road. The poles would range in height from approximately 56.5 to 101.5 feet above grade. The diameter of the pole at ground level is approximately 30 inches for light-duty steel poles and approximately 42 inches for heavy-duty steel poles. The poles would be inserted into the ground to a depth of approximately 7 to 16 feet, as necessary for installation. Light-duty steel poles would be used at 31 locations. It is not anticipated that heavy-duty steel poles would be needed for the Proposed Project.

3.5.3.2 Foundation Poles

Concrete-pier foundation poles are engineered steel poles that are anchor bolted to a reinforced concrete foundation. Foundation construction would require an approximate 35- by 50-foot work area to provide a safe and adequate temporary workspace, including a temporary work area in the access road. The new poles would have a height of approximately 43 to 110 feet height above ground. Twenty-six concrete-pier foundation poles would be installed. The concrete base would measure approximately 6 to 11 feet in diameter, and approximately 2 vertical feet of the base would be exposed above ground level.

3.5.3.3 Distribution Underbuild

As described in the sections above, existing distribution lines are currently underbuilt through portions of the TL 6975 route between San Marcos Substation and Escondido Substation. In the Segment 1 Rebuild, the existing distribution underbuilt line, currently co-located with the Proposed Project, would be reconductored, and, based on new pole positions, some trenching would be involved to intercept existing underground conduit and reroute to the new pole. At Meadowlark Junction, the existing distribution line would also be reconfigured and rerouted to the new pole locations, along with an extended access road. One new pole with a height above ground of 85 feet would be installed at the junction of Segment 1 and Segment 2. Overhead work would occur at two poles at Meadowlark Junction, at a maximum height of 80 feet height above ground.

3.5.3.4 Reconductoring/Re-energizing

As described in the sections above, the Proposed Project would include reconductoring/re-energizing existing SDG&E power lines within the existing SDG&E ROW. Within the 1.8-mile Segment 1 rebuild portion of the Proposed Project, all wood structures would be replaced with steel poles, all porcelain insulators would be replaced with polymer insulators, and TL 680C would be reconductored with 636 ACSS/AW; TL 6975 would have 636 ACSS/AW. Within the Segment 3 reconductoring/re-energizing portion of the Proposed Project, an approximately 7.4-mile reconductoring is required of the de-energized segment that is on the existing lattice towers. The existing lattice tower and steel pole line contains conductors, hardware, and insulators on both sides of the double-circuit structures. The 250 MCM copper conductor and porcelain insulators on the north side of the towers would be removed and replaced with polymer insulators and new 636 ACSS/AW conductors. In Segment 3, for the re-energizing portion of the Proposed Project, the existing 900 ACSS/AW conductors would remain in place.

3.5.3.5 Segment 2 Conductor

New 69 kV steel poles would be installed along Segment 2. A 3-636 ACSS/AW conductor and polymer insulators would be installed along the new TL 6975 line from the junction with TL 680C at Palomar Airport Road and Meadowlark Junction.

3.5.4 Conductors/Cables

3.5.4.1 Above-Ground Installation

Figure 3-5: WPI Double Circuit Direct Buried, Figure 3-6: Type DC-X Double Circuit Foundation, Figure 3-7: WPI Single Circuit Direct Buried, and Figure 3-8: YPI Single Circuit Foundation depict sample drawings of direct-bury and supported foundation pole types. The distance from the ground to the lowest conductor would be at least 30 feet. The approximate distance between the conductors would be approximately 9 feet. The span lengths between poles would vary with terrain but, overall, would generally range from 365 to 1,230 feet. In Segment 1, along San Marcos Boulevard, the span averages approximately 365 feet; in Segment 2, the span lengths average approximately 1,230 feet; and in Segment 3, the span lengths average approximately 1,125 feet.

The components used to construct the 69 kV line would have non-reflective surfaces. The insulators would be constructed of a gray polymer, the conductors would be made from aluminum-wrapped steel, and the power poles and hardware would be dulled galvanized steel.

3.5.4.2 Below-Ground Installation

Within the Segment 1 rebuild portion of the Proposed Project, there are existing cable poles on which the distribution lines transition underground along the existing line. Based on new pole positions for the Proposed Project, some trenching would be involved to intercept existing underground conduit and reroute to the new pole.

Trenching activities would typically be performed within a 10- to 30-foot radius of the poles. A sketch of a typical distribution line duct bank (trench package) is included in Appendix 3-C: Typical Structure Diagrams.

As part of the Proposed Project, alternating current (AC) interference effects from the proposed TL 6975 power line on gas pipelines within the Proposed Project area were investigated. The following gas lines were taken into consideration:

- SDG&E L-1604 16” pipeline
- SDG&E L-49-111 4” pipeline
- SDG&E L-49-111 3” pipeline
- SDG&E L-49-106 8” pipeline
- SDG&E L-49-369 4” pipeline

These pipelines are subject to AC electrical interference effects from six existing and the proposed

TL6975 power line which parallel and cross the pipeline segments. The *AC Interference Analysis & Mitigation System Design Report* (ARK Engineering, September 22, 2017) based on this investigation summarized the AC electrical interference coupling effects on the gas pipelines. The report recommends additional AC mitigation methods. Two sections of AC mitigations are proposed to be installed to reduce the pipeline AC density. In addition, two coupon test stations to monitor the pipeline AC density area also recommended. The final design and details of the proposed AC mitigations will be determined based on the options presented for implementing this mitigation included in the report.

3.5.5 Substation Work

At San Marcos Substation, a new Circuit Breaker Pad, approximately 7 by 7 feet, would be installed. Seven piers, approximately 2 feet in diameter and 6 feet long, would be installed as well as an approximately 30-foot A-frame with two approximately 9- by 13-foot footings. A 69 kV SF_6 circuit breaker, as well as two 69 kV 2,000-amp disconnects, would be installed for the new line. The new power line would connect from the A-frame to the TL 6975 power pole via a single conductor/phase. Required control and protection relays would be installed in the existing control shelter.

At Escondido Substation, the existing overhead conductor would be transferred from the 138 kV rack to an existing 69 kV bay position for the new TL 6975. Three existing 69 kV circuits would be transferred to different bay positions to accommodate this new circuit and avoid power line crossings. The last overhead spans (drop spans) of existing power lines TL 6908, TL 6934, and TL 689 would be relocated to available bay positions. TL 6975 would take the existing bay location of TL 689, TL689 would take the bay location of TL6934, TL 6934 would take the bay position of TL6908, and TL6908 would relocate to Bay 16. At Bay 16, an oil containment wall that is approximately 14 by 12 feet and a Circuit Breaker Pad that is approximately 8 by 8 feet would be removed because the oil Circuit Breaker would be replaced with a Gas Circuit Breaker. A new, larger Circuit Breaker Pad of approximately 10 by 10 feet would be installed. To connect TL 6908, two 69 kV 2,000-amp disconnects and one 69 kV SF_6 circuit breaker would be installed. Relay settings would be modified as required in the existing control shelter. New steel poles and replacement guys and anchors would be required at the bay locations.

3.6 PERMANENT LAND/RIGHT-OF-WAY REQUIREMENTS

The following discussion describes the land and ROW requirements for each segment of the Proposed Project. These requirements are also summarized in Table 3-3: Permanent Land and ROW Requirements .

Table 3-3: Permanent Land and ROW Requirements

Proposed Project Segment	Approximate Length (feet)	Approximate Area (acres)
Rebuild Segment 1		
Widen existing ROW to accommodate replacement poles	5,146	1.224

Proposed Project Segment	Approximate Length (feet)	Approximate Area (acres)
New Build Segment 2	0	0
Reconductoring/Re-energizing Segment 3	0	0

3.6.1 Segment 1

SDG&E currently has existing easements and franchise agreement rights in the rebuild portion of the Proposed Project along a 10- or 20-foot-wide SDG&E ROW corridor. In portions of the corridor where the existing easement is 10 feet wide, additional ROW would be acquired to provide a 20-foot-wide easement and accommodate the new structures. This segment is approximately 1.8 miles between San Marcos Substation, along San Marcos Boulevard and Palomar Airport Road, to an existing SDG&E corridor west of White Sands Drive. This portion includes an existing 69 kV circuit to be converted from a single-circuit structure line into a double-circuit structure line to support both the existing (TL 680C) circuit and the proposed TL 6975 circuit. All poles are within city streets are in a franchise position.

SDG&E currently owns the approximate 1.87-acre parcel that contains San Marcos Substation. All anticipated work to integrate the new power line would be done within the existing SDG&E substation area. No new ROW would be required.

Construction access and permanent access are currently provided by existing SDG&E easements and SDG&E franchise rights landowners. No additional land acquisition for access purposes is anticipated.

3.6.2 Segment 2

SDG&E currently has valid easements and franchise agreement rights in the new build portion of the Proposed Project along a 150-foot-wide SDG&E corridor. This segment is approximately 2.8 miles long, starting at Palomar Airport Road west of White Sands Road at the end of Segment 1, and traveling south to the existing Meadowlark Junction (north of San Elijo Road and Hidden Canyon Road), adjacent to the existing TL 13811/13825 power line. This portion includes a single-circuit 69 kV overhead power line that would be constructed on new steel poles within the SDG&E corridor approximately 50 feet east of centerline of the existing structures. All of the new steel poles would have graded roads and access/maintenance pads built to them in order to facilitate construction and provide long-term maintenance access.

Construction access and permanent access are currently provided by existing SDG&E easements and SDG&E franchise rights. No additional land acquisition for access purposes is anticipated.

3.6.3 Segment 3

SDG&E currently has valid easements and franchise agreement rights in the reconductor/re-energize portion of the Proposed Project along an existing SDG&E ROW corridor. This segment is approximately 7.4 miles long, between Meadowlark Junction and Escondido Substation. This portion includes reconductoring and re-energizing the existing 138 kV power line and converting it to 69 kV within the SDG&E corridor. All pole replacements within Segment 3 have existing graded roads and access/maintenance pads to facilitate construction and long-term access. The new poles located near Escondido Substation would not require any grading and existing access is sufficient. The only grading required on Segment 3 is for a spur road near Meadowlark Junction.

Construction access and permanent access are currently provided by existing SDG&E easements and SDG&E franchise rights landowners. No additional land acquisition for access purposes is anticipated.

SDG&E currently owns the approximately 6-acre parcel for Escondido Substation. All anticipated work to integrate the new 69 kV Proposed Project would be done within the existing SDG&E substation area. No new ROW would be required.

3.7 CONSTRUCTION

This section includes an overview of the typical methods that would be used for construction of the Proposed Project. Specifically, this section describes typical construction methods for overhead facilities, pole types, construction equipment, and temporary construction work areas.

Typical drawings for the Proposed Project structures are included in Appendix 3-C: Typical Structure Diagrams.

It is anticipated that construction of the Proposed Project would result in up to approximately 45 to 90 cubic yards of excavation for concrete foundations at each location. Cut and fill would also be required at some structure locations to create construction and line maintenance pads. Detailed civil engineering for these work pads has yet to be completed. Actual cut-and-fill grading amounts may vary, dependent upon actual field conditions and final detailed engineering, but are estimated to be approximately 3,751 cubic yards of cut and 4,072 cubic yards of fill. Approximately 3,063 cubic yards of soil would be imported, and 2,742 cubic yards of soil would be exported.

3.7.1 Temporary Work Areas

Temporary work areas would be required for construction of new facilities, rebuilding and removal of existing facilities, and storage and staging of construction equipment and materials. Each of these temporary work areas is described in detail in the following paragraphs; summarized in Table 3-4: Temporary Work Areas; and shown in Appendix 3-A: TL 6975 Power Line Route Map. All temporary work areas would be accessed from existing access roads, by overland[1] travel, or by foot. To provide a safe and adequate work area for construction workers and avoid and minimize impacts on sensitive resources, the precise location, configuration, and number of temporary work areas may change at the time of construction because of site conditions and construction requirements. The initial estimate of impact would be for the worst-case scenario, and the goal would be to not exceed the original estimate. All changes and impacts would be documented during construction to ensure that the worst-case scenario is not exceeded. As appropriate, the on-site biological monitor would assist construction crews in locating work areas to minimize impacts.

Table 3-4: Temporary Work Areas

Type of Work Area	Approximate Quantity	Total Approximate Area (acres)
Stringing Sites	21	1.8
Helicopter Incidental Landing Areas	0	0
Staging Yards	10	74.1
Guard Structures	50	0.40
Pole Work Areas	93	7.3
Turnaround Areas	N/A	N/A
Underground Construction	N/A[1]	0.1
Temporary Poles[2]	TBD	TBD
Notes: [1:] A total of 360 feet of underground conduit would be installed. [2:] Temporary poles would occasionally be used during construction; however, location and quantity are yet to be determined.		

All work areas would be restored, as described in Section 3.7.7, Cleanup and Post-Construction Restoration.

3.7.1.1 Stringing Sites

Approximately 21 stringing sites would be established to provide a safe work space for installation and removal of overhead conductors and underground cables. These stringing sites would generally be located adjacent to designated 69 kV poles, as shown in Appendix 3-A: TL 6975 Power Line Route Map. The stringing sites would be approximately 20 feet long, 125 feet wide, and located directly in line with or offset from the conductor. As a result, the approximately 21 stringing sites would require approximately 1.8 acres of land in total. Grading of the stringing sites is not expected to be necessary.

[1] Overland travel refers to temporary vehicular access across unimproved areas. Overland travel areas are not graded or subjected to other earthwork improvements. Following construction, these areas are returned to an approximate pre-construction state.

The location of stringing sites may be modified or additional stringing sites may be identified during construction in order to safely and efficiently string the conductors. These changes could result from site conditions and construction requirements.

3.7.1.2 Pole Work Areas

To accommodate construction equipment and activities during the installation and removal of power poles and structures and while transferring the power line conductors and re-energizing, temporary work areas would be cleared and graded at each location. Work areas for the different pole types are summarized below. It is anticipated that each of the:

- Direct-bury steel poles, removal poles, and overhead-work-only poles would require an approximately 40-foot-diameter work area;
- Each of the micropile foundation steel poles, if required, would require an approximately 35- by 50-foot work area; and
- Each of the pier foundation steel poles would require an approximately 35- by 50-foot work area

The work areas for each type of pole foundation would generally be centered on the existing pole location; however, actual work areas would vary in shape and size and be determined by site conditions and access requirements. The on-site biological monitor, as appropriate, would assist construction crews in locating pole work areas. For purposes of analysis, temporary impact areas for direct-bury steel poles and pier foundation poles, including the work area previously described, and an additional potential impact area (approximate total of 35 by 50 feet) would be located primarily within the access road to account for minor modifications made in the field during construction. In addition, in order to maintain a safe working space for crewmembers while working directly under poles, construction vehicles, equipment, and materials may need to be staged off of existing access roads and/or outside of delineated temporary work areas; however, the on-site biological monitor would assist crews in locating appropriate staging areas for construction vehicles, equipment, and materials. Any temporary impacts associated with construction work areas would be recorded by the biological monitor and be included in the Proposed Project's Post-Construction Report; these impacts would be mitigated or the areas restored, as necessary. Please see Section 3.7.7, Cleanup and Post-Construction Restoration, below, as well as, Section 4.4, Biological Resources, for a further discussion of remediation of temporary impacts.

All dimensions would be dictated by site conditions but could be customized per site. In total, the installation of the new 69 kV steel poles for the Proposed Project, as described in Section 3.5.3, Poles/Towers, would typically require approximately 50.3-square-foot work areas (this area may be smaller or larger at various locations); however, because most of the new poles in Segment 1 would be located in the immediate vicinity of existing poles, the actual proposed work areas would often be much smaller because existing maintenance pads and access roads would be utilized during construction of new poles as much as possible. These work spaces provide a safe working area for equipment, vehicles, and materials during pole installation and maintenance. A minimum of 15 feet of clearance (approximately 700 square feet) would be maintained around certain new poles for the purposes of maintenance and inspection activities. A total of approximately 93 work areas, totaling approximately 7.3 acres, would be required.

3.7.1.3 Underground Construction

To accommodate the installation of the underground duct banks, temporary workspaces, centered on the duct bank alignments, would be established (Figure 3-9: Typical Underground Duct Bank). These areas would be cleared and graded, as needed, to provide a safe operating space for the construction equipment.

The Proposed Project would include installing approximately 360 feet of primary and secondary underground 12 kV conduit from new poles to intercept locations along existing conduit packages. To accommodate installation of the underground distribution line, utilizing the cut-and-cover construction method, an approximately 15-foot-wide workspace would be required. A total of approximately 3,000 square feet of workspace, requiring approximately 0.10 acre, would be established prior to construction.

3.7.1.4 Guard Structures

Bucket trucks are often utilized as guard structures during stringing activities. Where wooden poles are used as guard structures instead, installation requires the temporary use of an area measuring up to approximately 1,500 square feet, depending upon guard structure configuration and location. The temporary work area is located in the immediate vicinity of the guard structure location. No permanent impacts would result from the utilization of guard structures. Guard structure installation, utilizing wood poles, would include excavating holes that would be approximately 3 feet in diameter and 10 feet deep, along with an additional 14- by 25-foot temporary work area. Excavated soils would be temporarily stockpiled and replaced within the excavation following stringing activities. If boom trucks are used as guard structures, the temporary work area would be 14 by 25 feet.

3.7.1.5 Temporary Poles

Temporary poles would occasionally be used for the Proposed Project. These poles are used to temporarily hold conductors while work, including the installation of permanent poles and structures, is being completed in adjacent areas. It is anticipated that each of the temporary poles would require an approximate 20-foot-diameter work area plus the use of the existing road.

3.7.1.6 Staging Yards

The Proposed Project includes approximately 10 temporary construction staging yards (refer to Appendix 3-A: TL 6975 Power Line Route Map), resulting in a total area of approximately 74.1 acres. The staging yards may be used as refueling areas for vehicles, and construction equipment; as equipment wash stations; for pole assemblage; for storage of material and equipment, storage containers, construction trailers, and portable restrooms; and for parking and lighting. These areas may include generator use for temporary power in construction trailers. Construction workers would typically meet at the staging yard each morning and park their vehicles at the yard. In-ground fencing would be installed at the staging yards wherever it is not already installed. Gravel may be used to line the ground at staging yards and avoid the creation of unsafe surface conditions and unnecessary sediment transport off-site.

SDG&E has attempted to identify a reasonable number of staging yards, commensurate with the size, location, and scope of the Proposed Project. Past staging yards were identified as well as large undeveloped areas near one or more portions of the Proposed Project that have been previously disturbed and/or graded. Although SDG&E has exercised reasonable diligence in identifying potential construction staging yards, there is no guarantee that the identified staging yards would be available by the time construction begins for the Proposed Project. Other potential staging yards may be identified as part of the environmental review process. Potential staging yards are identified in Table 3-5: Potential Staging Yards.

Two auxiliary staging yards were identified in Table 3-5: Potential Staging Yards. These two yards are not located within the Proposed Project Area and would not be used for the majority of Proposed Project activities. The Kearny staging yard is currently owned by SDG&E and used for other projects. The Icon 3PL Materials Yard could serve as a potential vendor drop for materials ahead of yard/site delivery. These auxiliary yards could provide additional storage as necessary, although they would not be a site for vehicle refueling, construction trailers, portable restrooms, parking, or equipment wash areas. These auxiliary yards are not intended for use throughout the phases of the Proposed Project; they are intended for use only in extenuating circumstances. Therefore, they have not been included in the analysis found within this PEA.

Table 3-5: Potential Staging Yards

Staging Yard Name	Description	Size (acres[1])	Location in Relation to the Proposed Project
Carlsbad Business Park within the City of Carlsbad	Staging yard has been previously disturbed and graded, within an industrial area. Located along Eagle Drive north of Palomar Airport Road.	5.94	Northern portion of the Proposed Project. Approximately 0.36 mile west of Pole 51.
Eagle Drive #2 within the City of Carlsbad	Staging yard has been previously disturbed and graded, within an industrial area. It has graded access within the lot. Located along Eagle Drive north of Palomar Airport Road.	5.8	Northern portion of the Proposed Project. Approximately 0.46 mile west of Pole 51.
Lionshead Ave #5 within the City of Carlsbad	Staging yard has been previously disturbed and graded, within an industrial area. It has graded access within the lot. Located along Lionshead Avenue north of Palomar Airport Road.	4.5	Northern portion of the Proposed Project. Approximately 0.06 mile north of Pole 51.

Staging Yard Name	Description	Size (acres[1])	Location in Relation to the Proposed Project
Montiel and Rock Springs within San Diego County	Staging yard has been previously disturbed and graded, within a residential area. Located along Rock Springs Road.	5[2]	Northern portion of the Proposed Project. Approximately 0.71 mile northeast of Escondido Substation.
Recycling Plant within the City of San Marcos	Staging yard has been previously disturbed and graded, within a large warehouse recycling yard. It has graded access and paved indoor storage. Located along San Elijo Road.	Lot 1: 5.6 Lot 2: 1.45	Southern portion of the Proposed Project. Approximately 0.21 mile south of Pole 77.
NE District Employee Parking Lot in Escondido	The staging yard is an existing parking lot with planters at the end of the rows with small trees. It is located along Commercial Street	1	Eastern portion of the Proposed Project. Approximately 300 feet south of Escondido Substation
Harmony Grove in unincorporated San Diego County	The staging yard is graded and devoid of vegetation. The staging yard is two lots north and south of Harmony Grove Village Parkway.	Lot 1: 2.54 Lot 2: 1.85	Eastern portion of the Proposed Project (south/right ½). Approximately 0.4 mile south of Pole 106.
South Andreasen in the City of Escondido	The staging yard has four lots that are already graded, with dedicated entry points and low vegetation growth. The staging yard is along Citracado Parkway.	Lot 1: 2.95[2] Lot 2: 1.062 Lot 3: 1.92[2] Lot 4: 2.2[2]	Eastern portion of the Proposed Project. Approximately 100 feet west of Pole 109.
Kearny in the City of San Diego (Auxiliary)	The staging yard is owned by SDG&E and located along Overland Avenue.	15.98	Auxiliary
Icon 3PL Materials Yard in unincorporated San Diego County (Auxiliary)	The staging yard is a potential vendor drop for materials ahead of yard/site delivery.	14.5	Auxiliary

Notes:
[1] Acreage is approximate because sensitive habitats within the staging yards would be avoided.

3.7.1.7 Helicopter Incidental Landing Area/Zone during Construction

Helicopters would be used during stringing and installation activities; however, there would not be incidental landing areas (ILAs) for the Proposed Project. The helicopter would be staged at Palomar Airport and would not be required to land at the Proposed Project.

3.7.2 Access Roads

Construction access would use existing access roads and public roadways to the extent possible. Most work areas are accessible by vehicle on unpaved SDG&E-maintained access roads or by overland travel. To provide crews and equipment access to the associated poles, existing access roads may require smoothing or refreshing and/or vegetation clearing may be necessary to maintain some existing access roads and re-establish unmaintained access roads. Pursuant to SDG&E's *Subregional Natural Community Conservation Plan* (NCCP), SDG&E is not required to mitigate for impacts on vegetation resulting from maintenance (i.e., re-establishing) of existing access roads. At designated drainage-crossing locations along the access roads, the blade of the smoothing equipment would be lifted 25 feet on either side of the drainage to avoid affecting the drainage. Drainage crossings may be temporarily bridged where feasible.

Based on preliminary engineering, four new spur roads would be required for access to Structures 68, 70, 77, and 78. Approximately 225 linear feet of new spur road from the Structure 68, 70, 77, and 78 pads to the existing access road would be built to access a new capacitor for maintenance. The four new spur roads would be approximately 14 feet wide, requiring approximately 0.09 acre of land (see Table 3-6: Access Road Characteristics). A new access road would also be constructed to access Pole 36. It would be 88 feet long and 14 feet wide, requiring an approximate area of 0.03 acres.

Table 3-6: Access Road Characteristics

Type of Road	Description	Approximate Area (acres)[1]
Existing Dirt Road	Typically, double track. May have been graded previously. No other preparation required, although a few sections may need to be regraded and crushed rock applied in very limited areas for traction.	28.46
New Permanent Spur Roads	Roads would be 14 feet wide, graded. No other preparation required, although crushed rock may need to be applied in very limited areas for traction.	0.09
New Permanent Access Road	Roads would be approximately 14 feet wide, graded. No other preparation required, although crushed rock may need to be applied in very limited areas for traction.	0.03
Overland Access	No preparation required. Typically, grassy areas that are relatively flat. No restoration would be necessary.	0
Footpath	Foot paths may require minor trimming to traverse. Construction crews would be selective regarding which paths they choose to use.	0
Notes: [1] Based on typical road width of 14 feet.		

Vehicles would remain within existing access roads, previously disturbed areas, and designated temporary work areas, where feasible. In addition, contractors may require additional turn-around and vehicle passing locations to safely operate construction vehicles and equipment. The on-site monitor would assist crews in locating vehicle turn-around and passing areas that avoid and minimize impacts on sensitive resources. Any temporary impacts associated with turn-around and passing areas would be recorded by the biological monitor and included within the project Post-Construction Report and mitigated as necessary, pursuant to the *SDG&E Subregional NCCP*.

3.7.3 Helicopter Access

Helicopters would be utilized as a construction tool for specific activities, including (but not necessarily limited to) stringing of overhead conductor, installation or removal of structures, and transportation of equipment associated with the Proposed Project. SDG&E anticipates that light- or medium-duty helicopters (e.g., K-Max and Astar) may be utilized. Helicopters would be utilized during daylight hours, and flight paths would generally be limited to the existing ROW, except for ingress and egress from the helicopter landing staging area, Palomar Airport.

Helicopter flight would be generally limited to within SDG&E's existing easement. Helicopter activities are anticipated to require up to 8 hours of total operation. SDG&E Best Management Practices (BMPs) would be implemented at the helicopter landing areas to reduce potential impacts related to air quality, hazards and hazardous materials, and noise. These specific practices are discussed in detail in Section 4.3, Air Quality; Section 4.8, Hazards and Hazardous Materials; and Section 4.12, Noise.

3.7.4 Permanent Work Areas

The Proposed Project would be located predominantly within existing utility corridors and franchise areas that currently feature permanent work pads and access roads. Operation and maintenance of the Proposed Project would utilize these existing work areas and roads as well as limited additional proposed permanent work areas that would remain following completion of construction activities. Table 3-7: Summary of Permanent Work Areas, outlines the anticipated permanent work areas that would be created as a result of the Proposed Project. Also see Appendix 3-A Power Line Route Mapbook for the location of permanent work areas. It is important to note that the permanent work areas described in Table 3-7 would be contained within the temporary work areas described in Section 3.7.1, Temporary Work Areas, and Table 3-4: Temporary Work Areas. Cut and fill would also be required at some structure locations to create construction and line maintenance pads. Detailed civil engineering for these work pads has yet to be completed. Actual cut-and-fill grading amounts may vary, dependent upon actual field conditions and final detailed engineering, but are estimated to be approximately 3,751 cubic yards of cut and 4,072 cubic yards of fill. Approximately 3,063 cubic yards of soil would be imported, and 2,742 cubic yards of soil would be exported.

Table 3-7: Summary of Permanent Work Areas

Work Area	Approximate Number	Approximate Area (acres)
New Structure Operation Work Pads[1]	60	1.92
New Permanent Spur Roads[2]	4	0.12
New Permanent Access Road	1	0.18

Notes:
Table contents based on preliminary engineering and subject to change.
[1] Note that permanent structure operation work pads would be contained within the temporary structure installation work areas described in Section 3.7.1, Temporary Work Areas, and Table 3-4: Temporary Work Areas. Retaining walls and other area required to create a safe operations work pad are also included within this calculation. Areas are included here only where new work pads would be required. Therefore, the number of new work pads is less than the total number of new structures.
[2] The Proposed Project would be located within existing utility corridors with extensive existing access and spur roads. Operation and maintenance of the Proposed Project would utilize these existing roads for the vast majority of access requirements. Only newly required spur roads are included within this table because the existing access road network is considered part of the existing environment.

3.7.5 Vegetation Clearance

The Proposed Project would require some vegetation clearing associated with access and work areas during construction and operation and maintenance of the facilities. Work areas utilized solely for construction are often simply cleared of vegetation, and grading is undertaken only where relatively flat areas are not already present. Construction activities will often utilize existing flat, cleared areas such as existing access roads and previously disturbed areas. For pole construction within existing utility corridors, including projects that involve pole replacements, the line maintenance pads are also utilized for construction activities. Most of the new poles associated with the Proposed Project would be constructed close to existing poles. The amount of space needed for construction of new structures would vary, depending on the size and type of the structure, the surrounding topography, and the presence of sensitive resources.

Power line maintenance pads are cleared and graded flat and maintained free of vegetation for the operational life of the Proposed Project. As needed, retaining walls would be installed to ensure safety and stability of the power line maintenance pad where geologic and topographic conditions warrant.

The specific amounts and types of vegetation removed may not be known until plant surveys, field reviews, and Proposed Project engineering are complete. SDG&E is expected to have a reasonable estimate of the vegetation clearance required for the Proposed Project, based on established data available at that time.

3.7.6 Erosion and Sediment Control and Pollution Prevention during Construction

Soil disturbance would occur at pole installation locations along the power line and at temporary work areas. A list of potentially affected soils can be found in Table 4.6-3 As described above, these areas would require vegetation clearing and minor grading.

SDG&E will adhere to National Pollutant Discharge Elimination System Construction General Permit requirements if applicable. Projects that disturb 1 acre or more of soil are required to obtain coverage under California State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction Activity Order No. 2009-0009-DWQ (General Construction Permit). This permit is meant to control the discharge of pollutants from point sources. The General Construction Permit requires the applicant to develop a Stormwater Pollution Prevention Plan (SWPPP) that includes a selection of BMPs to control erosion and discharge of sediments. Furthermore, the BMPs included in the SWPPP must be monitored and revised throughout the construction process, as needed. In addition, SDG&E would implement its *BMP Manual and Operational Protocols*. This manual includes BMPs that reduce impacts on soil loss and help ensure BMP usage is consistent with applicable rules and regulations.

3.7.7 Cleanup and Post-Construction Restoration

SDG&E would restore all areas that are temporarily disturbed by Proposed Project activities (including stringing sites, structure removal sites, and staging areas) to approximate pre-construction conditions, consistent with fire break requirements. Restoration could include reseeding; planting replacement vegetation; restoring removed curbs, gutters, and sidewalks; repaving all removed or damaged paved surfaces; or replacing structures (such as fences), as appropriate. In addition, all construction materials and debris would be removed from the Proposed Project Area and recycled or properly disposed of off-site. See Table 3-8: Common Destination of Retired Project Components, for information on construction material disposal. SDG&E would conduct a final survey to ensure that cleanup activities have been successfully completed, as required.

Impacts on vegetation within and in the vicinity of proposed staging yards, proposed and existing access roads, and public roads may occur (discussed in Chapter 5, Detailed Discussion of Significant Impacts). Restoration activities would occur under the direction of a habitat restoration specialist. Temporarily disturbed areas where native vegetation would be affected that would not need to be maintained in a cleared state would be enhanced through vegetation restoration, habitat reclamation, or a combination of the two. Habitat reclamation involves the elimination of existing exotic vegetation (i.e., weed abatement) to facilitate the natural recolonization of a native habitat. Habitat restoration entails a range of techniques, including seeding, imprinting, and soil and plant salvage. The specific technique, type of equipment, and number of personnel required would depend on the size of the restoration area and the condition of the habitat, including the soil. Post-construction activities would also include erosion control and trash and debris removal immediately following completion of construction. Where land is rented from private landowners (such as staging yards), post-construction restoration may be completed in consultation with the landowner. All disturbed areas such as access roads and staging yards would be regraded to existing contours using a grader. Trenches within public roadways would be restored using rollers, pavers, graders, and concrete trucks.

Removed wood poles would be reused, recycled, or disposed of. Non-reusable treated wood would be disposed of in a composite-lined portion of a municipal solid waste landfill approved by the Regional Water Quality Control Board. In San Diego, Otay Landfill is currently the only composite-lined landfill that will accept utility poles and treated wood. Otay Landfill is located approximately 40 miles southeast of the Proposed Project.

Table 3-8: Common Destination of Retired Project Components

Project Structure, Material, or Component	Common End Use or Destination	Estimated Quantities
Wood Power Line Structures/Poles	Sanitary disposal	120 tons
Conductor Cable	Recycled	30,000 feet
Insulators	Sanitary disposal	2 tons
Scrap Steel, Copper, and Other Metal	Recycled	1 ton
Concrete	Recycled	1 ton
Soils	Reused on-site or disposed of pursuant to applicable laws	15,000 cubic yards
Batteries	Recycled	N/A

3.7.8 Power Line Construction (Above Ground)

The procedures for bringing personnel, materials, and equipment to each structure site; installing the supporting structure foundations; installing the supporting structure; and stringing the conductors may vary slightly along each segment or at any particular structure site. The general methods used to construct an overhead power line are described in the following paragraphs.

3.7.8.1 Site Preparation for Structure Foundations

Prior to installing the structure foundations, vegetation at each of the structure sites would be cleared, and the area would be graded either flat or in a terraced fashion, as needed. At some sites, soil may be imported as necessary to raise the elevation of the structure pads, and retaining walls may be needed. Material removed during the process would be spread over existing access roads and work pads as appropriate or disposed of off-site according to all applicable laws.

3.7.8.2 Concrete Pier Foundations

A large auger would be used to excavate holes, which could range from 6 to 11 feet in diameter. Foundation depths would typically range from approximately 20 to 50 feet but could increase because of soil conditions. If unstable soil conditions are encountered, hole excavations may require the installation of steel casings to stabilize the sides of the excavation. The casing diameter would approximately match the diameter of the excavation. The length of the casing installed would normally be to the full depth of the excavation. The length of the individual section of the casing is typically limited to 20 feet; therefore, multiple sections of casing may be used on deeper foundations. Following excavation, a reinforcing steel cage and anchor bolt cage would be installed in each hole. The steel cages would typically be assembled at the materials storage and staging areas, then transported to each of the structure sites. The anchor bolt cages would be assembled off-site and delivered to each structure site. Typical foundations would require approximately 45 to 90 cubic yards[2] of excavation and a slightly larger volume of concrete placed into the holes because the foundations would extend approximately 2 feet above the ground surface. Because of their larger diameter, cable pole foundations could require up to approximately 175 cubic yards[3] of concrete. The concrete curing period would be approximately 1 month, during which time workers would remove the concrete forms and place backfill around the foundations, as needed.

3.7.8.3 Micropile Foundations

A micropile foundation consists of several small-diameter, drilled, and grouted reinforced foundations, which are arranged in a circular pattern. For electric power line structure support, a series of approximately four to 16 (or more) individual micropiles are arranged in a circular pattern to take the place of a larger conventional reinforced concrete drilled pier that would typically be approximately 4 to 10 feet diameter and 10 to 40 feet deep. One micropile typically consists of a small hole (approximately 6 to 8 inches in diameter) excavated to a depth of approximately 10 to 40 feet, depending on the properties of the soil or rock underlying the surface. A steel rod would be inserted into the hole and centered, and the surrounding annulus would be filled with a non-shrink grout. The steel rod would protrude above grade to be connected to a transition steel plate that would support the structure above grade. Loads from the above structure would be transferred to the steel rod, then transferred from the rod to the grout to the surrounding soil. A steel pipe or casing is often inserted in the upper portions of the micropile to add strength for shear transfer and provide for local upper-portion unbonded axial movement of the rod.

The micropiles are typically installed from a platform situated approximately 6 feet above the ground surface. The platforms and all equipment can be placed by a truck-mounted crane or flown to sites by helicopter. The platform would be supported on four to six telescoping legs that would be adjusted to support the platform on slopes. The drilling process would take place from the platform, and drills would be powered by generators or compressors that would either rest on the platform or be supported nearby on the ground.

Equipment used for the micropile installations would be smaller and more portable than the large drill rigs used for drilled pier excavation and construction and could be flown into inaccessible

[2] Assumes a typical 9-foot diameter foundation extended to depths ranging from 20 to 40 feet.
[3] Assumes an 11-foot-diameter foundation extended to an extra-deep excavation (50 feet) because of unstable soils.

areas. Micropile foundations are more suitable for areas that are inaccessible because of terrain and areas where access may be prohibited because of environmental, resource agency, or CPUC concerns. Micropile foundations are also suitable for rock areas where excavation of the rock for conventional drilled piers would be difficult, entailing the use of blasting or rock breakers with augers or core barrels. The spoils and local disturbances created by micropiles would be much less than those of conventional drilled concrete piers.

Other Considerations during Foundation Construction

It is not currently anticipated that blasting would be required to complete construction of the Proposed Project; however, in some locations where significant or dense rock is present, blasting may be required. Section 3.7.11, Blasting, describes the blasting process, should it be necessary.

Dewatering may also be necessary in some locations. Prior to construction, SDG&E would acquire coverage under the General Construction Permit from the SWRCB and prepare a SWPPP. The SWPPP would detail project information, dewatering procedures, stormwater runoff prevention control procedures, monitoring and reporting procedures, and BMPs. Bentonite or similar stabilizing materials may be used to support foundation installation when water is present within the excavation.

Steel Pole Installation for Concrete Pier and Micropile Foundations

Based on preliminary engineering and constructability review, it is anticipated that construction of power line structures would utilize ground equipment such as cranes, flatbed trucks, drill rigs, and excavators. Helicopters may be used during stringing activities and would be used for installation at Poles 61, 63, 64, and 65. The proposed alignment contains existing access and work space, which would help accommodate ground-based construction equipment.

New steel poles would be delivered to the structure sites in two or more sections via flatbed truck and assembled on-site using a small truck-mounted crane. Please see Figure 3-5: WPI Double Circuit Direct Buried, Figure 3-6: Type DC-X Double Circuit Foundation, Figure 3-7: WPI Single Circuit Direct Buried, and Figure 3-8: YPI Single Circuit Foundation for depictions of the standard pole types. After assembly, a large crane would be used to lift and set the pole sections into place on the anchor bolts, which would either be embedded in the concrete foundation or attached to the micropile foundations. The nuts on the foundation would then be tightened and secured. Steel poles would require the installation of two 8-foot-long by 4-inch-wide grounding rods, approximately 6 feet apart; the rods would be buried approximately 8 to 18 inches below the ground surface within the established work areas.

Direct-Bury Steel Pole Construction

To install the direct-bury steel poles, pole holes measuring approximately 54 inches in diameter would be excavated by using a drill rig mounted on the back of a truck, by hand, or by blasting with the aid of a hand jack powered by an air compressor. The temporary work area would be within an approximate 40-foot radius around the base of the pole. The diameter of the steel pole would measure up to approximately 30 to 42 inches. Plywood boards and plastic covering would be used to cover the excavated holes until pole installation activities begin. The excavated soil would be temporarily stockpiled adjacent to the excavated hole within the temporary work area. Once the pole bases are installed, concrete would be used to backfill the holes. Crews would spread and compact excess soil as close to the pole as possible (i.e., within 10 feet of the pole). Any additional excess soil would be dispersed evenly and compacted onto existing unpaved access roads where vehicle accessibility would be maintained. The appropriate BMPs would be used before, during, and after all Proposed Project-related construction activities where necessary to prevent off-site sedimentation. Direct-bury steel poles would require the installation of two 8-foot-long by 4-inch-wide grounding rods, approximately 6 feet apart; the rods would be buried approximately 8 to 18 inches below the ground surface within the established work areas. Steel poles would include galvanized pole steps if the pole locations are not accessible by a 24-hour all-weather access road.

Guard Structure Installation

Prior to removing the existing conductor and installing the new overhead conductor, SDG&E would utilize temporary guard structures at road crossings and other locations where the new conductor could come in contact with existing electrical and communication facilities, or vehicular and/or pedestrian traffic, in the event the line accidentally falls during stringing operations. Different types of guard structures may be used, depending on the site conditions, including boom and bucket trucks and wooden poles. Where wooden poles are used as guard structures, they typically are directly embedded wooden poles with a cross beam. In some locations, such as paved areas, a boom or bucket truck may be used as a guard structure. Where embedded wooden guard structures are used, an auger would be used to excavate the holes where the wooden poles would be installed, and a crane or line truck would lift the poles into place. No concrete foundations would be required to set the guard poles, and no grading or other site work is anticipated. The temporary guard poles would be removed following the completion of conductor stringing operations, and the holes would be backfilled with excavated soil.

Alternatively, SDG&E may use flaggers to temporarily hold traffic for brief periods of time while the overhead line is installed at road crossings. Typically, guard structures are utilized at crossings such as roadways, waterways, and utility crossings. Traffic control is typically utilized for small roadway crossings. For extremely large crossings, such as freeways, both guard structures and traffic control may be used as well as netting between the guard structures. Segment 1 will have 16 road crossings, six of which would have traffic plans and 10 would utilize a guard pole or boom truck. Segment 2 would have 10 road crossings, two of which would have a traffic plan and eight would utilize a guard pole or boom truck. Segment 3 would have nine road crossings, one of which would require a traffic plan; the other eight would utilize a guard pole or boom truck. SDG&E would acquire all required road crossing approvals, including implementation of any special guard structure procedures or requirements, as directed by each applicable land use jurisdiction.

Existing Facilities Removal

As previously described, construction of the Proposed Project segments would involve removing certain existing power line poles and structures (mainly wood but with a few steel structures). Refer to Appendix 3-A: TL 6975 Power Line Route Map, for the location of all poles to be removed. First, the existing conductor would be removed from the poles using wire trucks and pulling rigs. Guard structures would be utilized, as needed. For segments requiring reconductoring, existing hardware and insulators would be removed and replaced with new polymer insulators and hardware.

For steel poles and lattice structures that would be removed from service, the poles and lattice structures would be dismantled by cranes and aerial man-lifts in sections. The sections would be transferred to a flatbed truck using a small truck-mounted crane. The steel poles would then be transported off-site for recycling or disposal at an approved facility. The lattice structures would be further dismantled within SDG&E's utility easement or at the appropriate staging area. Following disassembly, the individual steel members would be cut into smaller sizes, placed in recycling receptacles, and transported to an approved SDG&E recycling center. After the poles have been removed, any existing concrete foundations would be jack hammered to approximately 1 to 2 feet below grade; debris would be removed and recycled or disposed of at an approved facility. The hole would then be backfilled with soil or materials similar to those in the surrounding area, and the site would be restored.

Wooden pole removal would begin with crews dismantling the hardware on the existing poles using cranes and aerial man-lifts. Crews may also climb poles to dismantle hardware. The wooden poles would be removed completely and transported off-site by flatbed truck for disposal at an approved facility. The base of the pole will be abandoned in place if it cannot be removed. If the base of the pole is removed, the void will be backfilled and compacted with native soil. All structural removal work would be completed from existing work pads (typically 35 by 75 feet) located at each existing pole site or temporary work areas for new structures, as needed. No new impact areas are anticipated to be required for pole removal. These areas would be kept clear of vegetation for operation and maintenance activities.

Conductor Stringing

Following guard structure installation, SDG&E would coordinate with the CAISO to obtain all of the necessary line clearances prior to beginning conductor installation. This would ensure that the existing power lines could be taken out of service and that power could be redistributed to service centers and customers. SDG&E would coordinate line outages to maintain system reliability and construction personnel safety. Based on preliminary engineering, SDG&E does not anticipate any Proposed Project-based interruption of service to customers during construction.

Conductor stringing operations begin with the installation of travelers, or "rollers," on the bottom of each of the insulators using helicopters or aerial man-lifts (bucket trucks). The travelers allow the conductor to be pulled through each structure until the entire line is ready to be pulled up to the final tension position. Following installation of the travelers, a sock line (a small cable used to pull the conductor) or the old conductor is pulled onto the travelers from structure to structure using helicopters or aerial man-lifts traveling along the ROW. Once the sock line is in place, it is attached to a steel cable and pulled back through the travelers. The conductor is then attached to the cable and pulled back through the travelers using conventional tractor-trailer pulling equipment located at the stringing sites. Anchors would be required to stabilize the equipment. Alternatively, specialized equipment may be utilized by helicopter for areas with limited access.

In some cases, sleeves or splices may be installed on the power line. This might occur when the conductor is slightly damaged during stringing operations or if the conductor is not long enough and needs to be joined to another segment. If the conductor is damaged, a repair sleeve would be wrapped around the outside of the conductor and pressed into place to protect the conductor. Full tension splices, or compression splices, are utilized when the conductor is damaged too severely for a repair sleeve, when the conductor is not long enough to span between dead-end structures, or if stringing locations are spread too far apart. During full-tension splices, the two ends of the conductor are connected with the use of heavy-duty vices or, alternatively, a small engineered implosive charge is wrapped around a specially designed metallic sleeve, creating a controlled implosive compression and connecting the two conductors.

Approximately 21 designated stringing sites would be required to tension the conductor to a pre-calculated level. The sites would also be needed to load the tractors and trailers with reels of conductors and the trucks with tensioning equipment. These stringing sites would also be used to collect conductors that would be removed from the existing lines onto reels for transport off-site. Appendix 3-A: TL6975 Power Line Route Map, details the locations of all stringing sites. Each stringing site would require clearing an area between approximately 0.05 and 0.52 acre. As described previously, depending on topography, some incidental grading may be required at stringing sites to create level pads for equipment.

After the conductor is pulled into place, the sags between the poles are adjusted to a pre-calculated level. Pursuant to General Order (G.O.) 95, the line would be installed with a minimum ground clearance dictated by the surrounding land uses, as described in Table 3-9: Minimum Conductor Ground Clearance. The conductor is then clipped into the end of each insulator, the travellers are removed, and vibration dampers and other accessories are installed.

Table 3-9: Minimum Conductor Ground Clearance

Conductor Voltage	Minimum Ground Clearance (feet)	Minimum Ground Clearance with Pedestrian Access Only (feet)
230 kV	30	25
138 kV	30	25
69 kV	30	25
12 kV	25	25
Source: PG&E		

During the conductor stringing, an Optical Ground Wire (OPGW, a shield wire with fiber optics) is sometimes strung on top of the power line poles, similar to the conductor stringing.

A helicopter would be used during stringing operations in Segment 2 to install the sock line that would be used to pull in the conductor. For stringing operations, it takes approximately half a day to pull in three phases of conductor for approximately 9,000 feet of power line. The helicopter would not be needed again for 2 to 3 weeks, until the next section of line is ready to be pulled. Helicopter activities would be staged out of the Palomar Airport and would not require incidental landing areas within the Proposed Project Area.

3.7.8.4 Belowground Construction

The general methods used to construct an underground distribution line are described in the following paragraphs. Within the Segment 1 rebuild, the existing underground distribution line that would be adjacent to the Proposed Project would be reconductored. Based on the new pole positions, some trenching would be involved to intercept the existing underground conduit and reroute it to the new pole.

3.7.8.5 Belowground Distribution Line Construction

The general methods used to construct an underground distribution line are described in the following paragraphs.

12 kV Distribution Installation

Trenching

Prior to trenching, other utility companies would be notified to locate and mark existing underground utilities along the proposed underground alignment. Exploratory excavations (i.e., potholing) would also be conducted to verify the locations of existing facilities in the ROW. Coordination with the City of San Marcos, City of Escondido, and San Diego County would also occur in order to secure encroachment permits for trenching in the applicable ROW, as required. It is anticipated that some lanes of traffic on active roadways such as San Marcos Boulevard would occasionally be closed during trenching activities. During lane closures, traffic controls would be implemented, as required by the encroachment permit.

Duct Bank Installation

Duct banks will be installed to intercept the existing conduit packages. As the trenches for the underground 12 kV duct banks are completed, SDG&E would install the cable conduits (separated by spacers) and pour concrete around the conduits to form the duct banks. The duct banks would typically consist of eight 5-inch-diameter PVC conduits, which house the electrical cables. The dimensions of the duct banks would be approximately 1.5 feet wide by 2.7 feet tall for a vertical configuration. The duct package generally consists of a single 12 kV distribution circuit.

Where the distribution duct bank would cross other substructures that operate at normal soil temperature (e.g., gas lines, telephone lines, water mains, storm drains, sewer lines), a minimal radial clearance of 12 inches would be required. In instances where the duct bank would be installed parallel to other substructures, a minimum radial clearance of 24 inches would be required. Ideal clearances of 2 to 5 feet are preferred. Where the duct banks cross or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (e.g., other underground power line circuits, primary distribution cables, steam lines, heated oil lines), additional radial clearance may be required.

Cable Pulling, Splicing, and Termination

After installation of the conduit, SDG&E would install the distribution cable in the duct banks. To pull the cable through the ducts, a cable reel would be placed at one end of the section, and a pulling rig would be placed at the other end. A large rope would then be pulled into the duct using a pull line, then attached to the pulling eyes to pull the cable into the duct. A lubricant would be applied to the cable as it enters the duct to decrease friction during pulling. The electric cables and the communication cable would be pulled through the individual ducts at the rate of two or three segments between vaults per day.

3.7.9 Substation Construction

The Proposed Project would not include earthmoving construction activities at San Marcos Substation or Escondido Substation. As discussed previously in Section 3.5.5, Substation Work, a circuit breaker pad, a SF_6 circuit breaker, seven piers, and an A-frame would be installed at San Marcos Substation. The new power line would connect from the A-frame to the TL 6975 power pole via a single conductor. At Escondido Substation, existing overhead conductor would be transferred from the 138 kV rack to an existing 69 kV bay position for the new TL 6975. Three existing 69 kV circuits would be transferred to different bay positions to accommodate this new circuit and avoid power line crossings. The last overhead spans (drop spans) of existing power lines TL 6908, TL 6934, and TL 689 would be relocated to available bay positions. A new circuit breaker pad and circuit breaker would be installed, and the old circuit breaker pad and an oil containment wall would be removed from Bay 16 of the substation.

3.7.10 Dewatering

Dewatering may also be necessary in some locations. Prior to construction, SDG&E would acquire coverage under the General Permit from the SWRCB and prepare a SWPPP. The SWPPP would detail Proposed Project information, dewatering procedures, stormwater runoff prevention control procedures, monitoring and reporting procedures, and BMPs.

3.7.11 Blasting

If rock is encountered during excavation, a hydraulic rock drilling and splitting (rock-splitting) procedure may be used to minimize trenching or drilling time, depending on site-specific conditions. The procedure involves drilling a hole in the rock and inserting a non-blasting cartridge of propellant. Activation of the cartridge is mechanically initiated by an impact generation device. This hydro-fracturing effect causes controlled tensile crack propagation in the rock but does not result in flyrock, noxious fumes, or ground vibrations.

In the unlikely event that rock blasting is used during construction in areas where solid rock is present and the hydraulic rock drilling and splitting procedure would be ineffective, the following procedure would be utilized to minimize both drilling time and noise impacts. The procedure would involve drilling approximately 3-inch-diameter blast holes and inserting explosives. Blasting caps would be connected, and a non-electric detonator would be employed. Flyrock protection would be installed prior to blasting, and seismographs would be placed to measure and record peak particle velocity and air blast levels at various distances from the blast site. Dust control would include a combination of steel plate covering and geo-textile fabric with chain-link fence covering and wetting the blasting surface. If blasting is utilized by the Proposed Project, the blasting contractor will be required to obtain a blasting permit and explosive permit per applicable local regulatory ordinances. The appropriate BMPs would be used before, during, and after all Proposed Project-related construction activities, where necessary, to prevent erosion and off-site sedimentation.

3.7.12 Unexploded Ordnance

Unexploded ordnances (UXO) are explosives (e.g., bombs, shells, grenades, land mines, naval mines) that did not explode when they were employed but still pose a risk of detonation, potentially many decades after they were used or discarded. The Proposed Project is not located on or adjacent to any UXO sites, based on the environmental database review conducted by EDR, Inc. (Appendix 4.8).

3.7.13 Construction Workforce and Equipment

It is estimated that the Proposed Project would involve approximately 80 construction crew members. Construction activities would involve several crews working concurrently at different locations (e.g., preparing staging yards). Power line construction would be conducted using stringing crews to string the conductor, foundation crews to work on the power line structure, and grading crews to prepare the structure sites for construction. In addition, the installation of underground power lines would also involve construction crews. For the Proposed Project, up to approximately 55 workers could be used at one time during power line construction, assuming that pier foundation construction occurs concurrently with direct-bury construction (refer to Table 3-11: Anticipated Construction Equipment). Refer to

Table 3-10: Estimated Construction Equipment and Personnel, for a complete list of the construction equipment and the number of personnel.

Table 3-10: Estimated Construction Equipment and Personnel

Activity	People	# of Days	Equipment	Quantity	Horsepower Rating	Hours of Use per Day	Total Hours of Use	Segment Number
Access Road Construction/ Refreshing	1 crew of 4–5	30	motor grader	1	174	6	6	Segment 2
			pickup truck	2	250	5	10	Segment 2
			water truck	1	250	4	4	Segment 2
Material Haul	1 crew of 5	30	yard and field crane or line truck	1 at each end	250		0	All segments
			fork lift	1 at each end	83		0	All segments
Preconstruction Activities (Staging Yard Setup, Road Refreshing, Vegetation Trimming/BMP Installation)	2 crews of 4–5 (8–10 total)	30	dump truck	2	250	3	6	All segments
			excavator	2	162	3	6	All segments
			loader	2	37	4	8	All segments
			motor grader	2	174	5	10	All segments
			mower	2	74	4	8	All segments
			tractor/ trailer unit	1	250	4	4	All segments
			pickup truck	2	250	4	8	All segments
			water truck	1	250	4	4	All segments
Auger Holes, Direct-Bury Poles TL6975: (approx. 34 poles)	2 crews of 4–5 (8–10 total)	45	air compressor	2	78	4	8	Segments 1 and 2
			boom truck	2	250	6	12	Segments 1 and 2
			drilling rig	2	82	6	12	Segments 1 and 2
			line truck	2	250	5	10	Segments 1 and 2
			pickup truck	2	250	4	8	Segments 1 and 2
			pressure digger	1	82	4	4	Segments 1 and 2
			tractor/ trailer unit	1	250	3	3	Segments 1 and 2
			water truck	2	250	4	8	Segments 1 and 2

Activity	People	# of Days	Equipment	Quantity	Horsepower Rating	Hours of Use per Day	Total Hours of Use	Segment Number
Foundation Construction (micropile) (approx. 0 poles)	2 crews of 4–5 (8–10 total)	45	air compressor	2	78	3	6	N/A
			backhoe	1	97	3	3	N/A
			crane	2	226	3	6	N/A
			crew truck	2	250	4	8	N/A
			flatbed truck	2	250	4	8	N/A
			forklift	2	83	3	6	N/A
			fuel truck	1	250	3	3	N/A
			generator	2	84	4	8	N/A
			grout plant	1	84	2-3	1	N/A
			pickup truck	1	250	4	4	N/A
			tractor/ trailer unit	1	250	3	3	N/A
			water truck	2	250	3	6	N/A
Foundation Construction (pier) (approx. 24 poles)	1 Crew of 4–5	30	air compressor	1	78	4	12	All segments
			boom truck	1	250	3	9	All segments
			drilling rig	1	82	7	21	All segments
			excavator	1	162	4	12	All segments
			forklift	1	83	3	9	All segments
			generator	1	84	3	9	All segments
			loader	1	37	3	9	All segments
			pickup truck	1	250	4	12	All segments
			water truck	1	250	3	9	All segments

Activity	People	# of Days	Equipment	Quantity	Horsepower Rating	Hours of Use per Day	Total Hours of Use	Segment Number
Structure Installation and Assembly, per Crew, 2 Crews Required (included old pole removal) (approx. 100 new structures, 19 removed structures	2 crews of 4–5 (8–10 total)	60	pickup truck	2	250	4	8	All segments
			bucket truck	3	250	6	18	All segments
			line truck	2	250	5	10	All segments
			helicopter, light duty	1		4	4	(Segment 2 only)
			boom truck	3	250	6	18	All segments
Stringing Activities/ Transfer Conductor/ Sagging Activities (includes removal of old conductor) (approx. 42 structures reconductored/re-energized)	2 crews of 4–5 (8–10 total)	10	boom truck	2	250	6	12	All segments
			double-bull-wheel tensioned (heavy)	1	300	6	6	All segments
			drum puller	1	300	6	6	All segments
			forklift	1	83	3	3	All segments
			line truck	2	250	4	8	All segments
			pickup truck	2	250	4	8	All segments
			water truck	1	250	4	4	All segments
			wire truck	1	82	5	5	All segments
			helicopter, light duty	1		4	4	(Segment 2 only)
Trenching for Installation of Underground Cables	1 crew (4–5 total)	10 (4–5 days for concrete truck and wire dolly)	concrete truck	2	400	3	6	Segments 1 and 2
			crane	1	226	4	4	Segments 1 and 2
			dump truck	1	250	3	3	Segments 1 and 2
			line truck	1	250	4	4	Segments 1 and 2
			water truck	1	250	3	3	Segments 1 and 2
			wire dolly	1	82	3	3	Segments 1 and 2
			pulling rig	1	82	4	4	Segments 1 and 2
			backhoe	1	97	3	3	Segments 1 and 2

Activity	People	# of Days	Equipment	Quantity	Horsepower Rating	Hours of Use per Day	Total Hours of Use	Segment Number
Demobilization/ Right-of-Way Restoration and Cleanup/Road Refreshing	2 crews of 4–5 (8–10 total)	20	backhoe	1	97	4	4	All segments
			dump truck	1	400	5	5	All segments
			excavator	1	162	4	4	All segments
			loader	1	37	4	4	All segments
			motor grader	1	174	4	4	All segments
			mower	1	74	4	4	All segments
			pickup truck	2	250	4	8	All segments
			tractor/ trailer unit	1	250	4	4	All segments
			water truck	1	250	4	4	All segments

Table 3-11: Anticipated Construction Equipment, describes how the equipment described in

Table 3-10: Estimated Construction Equipment and Personnel, would most likely be used for the Proposed Project.

Table 3-11: Anticipated Construction Equipment

Equipment Type	Equipment Use
Two-ton flatbed trucks	Haul materials (including new poles)
Aerial bucket trucks	Access poles, string conductor, modify structure arms, provide guard structures, and other various uses
Air compressors	Operate air tools
Asphalt grinder	Grind asphalt
Backhoe	Excavate trenches
Bobcat	Excavate trenches
Boom truck	Access poles and other height-restricted items Lift/set steel
Boom truck with trailer	Deliver steel, disc, panels and insulators
Bucket truck/man-lift	Set steel Install equipment Use as guard structure
Bulldozer	Grade pads and access road Demolition Excavate and backfill walls
Bull wheel tensioner	Control conductor at pulling tension during pulling operation
Cable dolly	Pull cable
Cable dolly (trailer)	Transport reels of conductor (no engine; can be pulled by assist truck)
Compactor	Compact soil Clear/grub/finish
Concrete saw	Cut and saw concrete and asphalt
Concrete truck	Transport and process concrete
Crane	Lift, position structures
Crew truck	Transport crew
Drilling rig/truck-mounted augur	Excavate for direct-bury and micropile poles Excavate trenches
Drum puller	Transmission and power line pulls
Dump truck	Haul excavated materials/import backfill, as needed
Dump truck with compressor and emulsion sprayer	Street repair
Excavator	Excavate soils/materials (trenching)

Equipment Type	Equipment Use
Flatbed boom truck	Haul and unload materials
Forklift	Transport materials at structure sites and staging yards
Fuel truck	Contains fuel
Generator	Portable electricity
Grader	Road construction and maintenance
Grout plant	Foundation construction
Helicopter (typically light and medium duty)	Transport materials, string conductor, install and remove travelers, set structures
Hydraulic rock-splitting/rock-drilling equipment	Drill through rock, as needed
Jackhammer	Break concrete and asphalt
Line truck	Install clearance structures Pull cables/connections
Loader	Demolition Load dump trucks
Mobile fueling trucks	Refuel equipment
Mower	Clear vegetation
Motor grader	Grading
Oil processing rig	Used for transformer oil processing
Paver	Paving of new asphalt
Pickup trucks	Transport construction personnel
Portable generators	Operate power tools
Pulling rig	Pull conductor into position or duct and secure it at the correct tension
Reel trailer	Feed new conductor to the pulling and tensioner Collect old conductor
Relay/telecommunication van	Transport and support construction personnel
Roller	Repair streets
Scraper	Grade pads and access roads
Splice trailer	Store splicing supplies
Spreader	Spread asphalt
Underground combo truck	Pull cable and connections
Tool van	Tool storage
Tractor/Trailer Unit	Transport materials at structure sites and staging yards
Vacuum truck	Pump water and liquids, as needed
Water truck	Dust control

Equipment Type	Equipment Use
Wire truck	Hold spools of wire
Source: SDG&E	

3.7.14 Construction Schedule

SDG&E estimates that construction of the Proposed Project would take a total of approximately 12 months to complete, depending upon unforeseen/unpredictable factors such as weather and required transmission outages. Two of the 12 months account for preconstruction activities. Construction is scheduled to begin in February 2020 and run through November 2020. The complete construction schedule, outlined by task, is summarized in **Error! Not a valid bookmark self-reference.**.

Table 3-12: Proposed Construction Schedule

Project Activity	Approximate Duration (days)	Anticipated Start and End Date
Pre-construction activities	30	Dec 30, 2019–Feb 7, 2020
Access road construction/refreshing	63	Feb 2020–Apr 2020
Material haul	30	Jan 21, 2020–Mar 2, 2020
Auger holes, direct-bury poles: (approx. 31 poles)	59	Segment 1: Feb 2020–Mar 2020 Segment 2: Mar 2020
Foundation construction (micropile)	N/A	N/A
Foundation construction (pier foundation), approx. 26 poles	136	Segment 1: Feb 2020–May 2020 Segment 2: May 2020–Aug 2020 Segment 3: May 2020
Structure installation and assembly, per crew, two crews required (including old pole removal) (approx. 100 new structures, 19 removed structures)	117	Segment 1: Mar 2020–May 2020 Segment 2: Aug 2020 Segment 3: May 2020
Stringing activities/transfer conductor/sagging activities	121	Segment 1: May 2020–Jul 2020 Segment 2: Sep 2020–Oct 2020 Segment 3: Jul 2020–Sep 2020
Trenching for installation of underground cables	98	Segment 1: May 2020–Jul 2020
Demobilization/right-of-way restoration and cleanup/road refreshing	112	Segment 1: Jul 2020–Sep 2020 Segment 2: Oct 2020–Nov 2020 Segment 3: Sep 2020–Oct 2020

3.8 OPERATION AND MAINTENANCE

3.8.1 General Project Operation and Maintenance Activities and Practice

This section describes the standard operation and maintenance activities and procedures that SDG&E currently conducts and would continue to conduct along the proposed power line route. For several years, SDG&E has continuously operated the facilities that would be modified by the Proposed Project. Following construction of the Proposed Project, SDG&E would continue to conduct these activities consistent with the *Subregional NCCP*, which is described in greater detail in Section 4.4, Biological Resources. No change in SDG&E's operation and maintenance practices (detailed below) is anticipated or included as part of the Proposed Project.

SDG&E would regularly inspect, maintain, and repair TL 6975, pending agency review of the Proposed Project and following completion of Proposed Project construction. These activities would involve both routine preventive maintenance and emergency procedures to maintain service continuity. SDG&E would perform aerial and ground inspections of Proposed Project facilities and patrol above-ground components annually. Inspection for corrosion, equipment misalignment, loose fittings, and other common mechanical problems would be performed at least every 3 years (per CPUC G.O. 165) for power lines.

The existing power line alignment requires some maintenance activities that would no longer be needed because of the installation of steel poles and reconductoring/re-energizing of the existing de-energized line. The existing wooden poles require intrusive inspections every 10 years, which would no longer be necessary with the new steel poles. The de-energized power line requires insulator washing four times a year. This activity would not be required once the power line is re-energized. This would result in a decrease in heavy truck miles, from approximately 91 to 84 miles per month. De-energized lines on Segment 3 are currently inspected and maintained the same way as energized lines; therefore, when the line is reconductored, it will not require additional maintenance activities or additional trips to the Proposed Project; however, the new structures in Segment 2 would require more maintenance. Because of the additional structures and hardware, Segment 2 would require more inspections, with more items that could require repair or replacement, which would result in more trips to the segment. The miles traveled by light-duty trucks per month would increase from approximately 156 to 168 miles, primarily due to the additional inspections required. Based on the estimated maintenance the Proposed Project would require, overall miles traveled per month would be approximately 252, which is relatively similar to the current approximately 247 miles traveled per month. Generally, maintenance activities would increase slightly with implementation of the Proposed Project.

3.8.2 Road Maintenance

Road maintenance includes grading of existing access roads, installation of BMPs specified in the SWPPP, spot repair of erosion sites, and vegetation trimming, as needed. The specific BMPs to be installed would be based on site conditions, but typical BMPs for road maintenance include fiber rolls, sandbag barriers, diversion berms, and drainage swales. SDG&E performs road maintenance as necessary. Road maintenance may require the use of a motor grader, water truck, and pickup trucks.

3.8.3 Pole Structure Brushing and Tree Trimming

In accordance with firebreak clearance requirements in Public Resources Code 4292 and Title 14, Section 1254, of the California Code of Regulations (CCR), SDG&E would trim or remove flammable vegetation in the area surrounding subject power line poles to reduce potential fire and other safety hazards. One-person crews typically conduct this work using mechanical equipment, consisting of chain saws, weed trimmers, rakes, shovels, and leaf blowers. SDG&E typically inspects poles on an annual basis to determine if brushing is required.

In accordance with tree and power line clearance requirements in Public Resources Code 4293 and Title 14, Section 1256, of the CCR as well as CPUC G.O. 95, SDG&E would trim trees and vegetation to manage fire and safety hazards and ensure electrical reliability. Regular inspection, regardless of habitat type, is necessary to maintain proper line clearances. SDG&E conducts tree-trimming activities with a two-person crew in an aerial lift truck and a chipper trailer. SDG&E typically inspects trees in its service area for trimming needs on an annual basis.

3.8.4 Application of Herbicides

An application of herbicides may follow the mechanical trimming of vegetation to prevent vegetation from recurring. This activity generally requires one person in a pickup truck, taking only minutes to spray around the base of the pole structure within a radius of approximately 10 feet. The employee either walks from the nearest access road to apply the herbicide or drives a pickup truck directly to each pole structure location as access permits.

3.8.5 Equipment Repair and Replacement

Pole structures may support a variety of equipment, such as conductors, insulators, switches, transformers, lightning arrest devices, and line junctions as well as other electrical equipment. SDG&E may need to add, repair, or replace equipment to maintain uniform, adequate, safe, and reliable service. SDG&E may remove and replace an existing structure with a larger or stronger structure at the same location or at a nearby location because of damage or changes in conductor size. Equipment repair or replacement requires crew access to the equipment to be repaired or replaced.

3.8.6 Use of Helicopters

SDG&E uses helicopters in the visual inspection of overhead facilities and routinely patrols power lines. SDG&E uses helicopters for patrolling power lines during trouble jobs (e.g., outages or service curtailments) and for conducting maintenance activities in areas that have no vehicle access or are in rough terrain.

3.9 ANTICIPATED PERMITS AND APPROVALS

Table 3-13: Anticipated Permits and Approvals

Permit/Approval/Consultation	Agency	Jurisdiction/Purpose
Federal Agencies		
Lighting and Aerial Marking	FAA	Construction of overhead facilities potentially requiring aerial marking will be determined with the FAA at a later date.
Congested Area Plan	FAA	Use of helicopters within populated areas will be coordinated with the FAA as applicable.
State Agencies		
PTC	CPUC	Overall project approval and CEQA review
NPDES – General Construction Permit	SWRCB	Stormwater discharges associated with construction activities disturbing more than 1 acre of land.
Local Agenices[2]		
Encroachment Permit and Traffic Control Plan(s)	City of San Marcos, Carlsbad, Escondido, and San Diego County	Construction within, under, or over city roadways (West San Marcos Blvd, Palomar Airport Road, S Rancho Santa Fe Road, San Elijo Road, Country Club Road, Kauana Loa Drive, and Auto Park Way)
Grading Permit	City of San Marcos	Required for permanent work pads and road extensions located in the Cities of San Marcos and Carlsbad

Notes:
Table contents based on preliminary engineering and subject to change.
[1] Permit is not currently anticipated to be required but may be required as a result of further refined project design or direct consultation with regulatory agencies.
[2] Noise variance approvals are not included herein because SDG&E would meet and confer with local agencies where construction is anticipated to exceed noise limits published within the applicable local noise codes. Actual noise variances would not be procured; therefore, this process is not listed within this table.

3.10 APPLICANT-PROPOSED MEASURES

In addition to the above project design features and ordinary construction/operating restrictions included as part of the Proposed Project description, SDG&E will also incorporate the Applicant-Proposed Measures (APMs) that have been identified and developed specifically for the Proposed Project during preparation of the PEA. Table 3-14: Applicant-Proposed Measures by Resource Area, identifies the APMs that are applicable to each resource area. The various resource sections of this document outline how and when the APMs will be applied to avoid or minimize impacts to a less-than-significant level.

Table 3-14: Applicant-Proposed Measures by Resource Area

Resource Area	Relevant Applicant-Proposed Measures
Aesthetics	N/A
Agriculture and Forestry Resources	N/A
Air Quality and Greenhouse Gases	N/A
Biological Resources	APM BIO-1 through APM BIO-9
Cultural Resources	APM CUL-1 through APM CUL-9
Geology, Soils, and Minerals	N/A
Hazards and Hazardous Materials	APM HAZ-4
Hydrology and Water Quality	N/A
Land Use and Planning	N/A
Mineral Resources	N/A
Noise	N-1, N-2, N-3
Population and Housing	N/A
Public Services	APM PS-1, APM PS-2, APM PS-3, APM PS-4
Recreation	APM PS-2
Transportation and Traffic	APM TRA-1, APM TRA-2
Utilities and Service Systems	N/A
Cumulative Impacts	N/A
Notes: N/A = Not Applicable	

Linear electric infrastructure projects, such as this one, typically traverse multiple jurisdictional boundaries, natural resource features, and habitat types. Until final design, and in some cases until installation, utility projects must remain more flexible in the definition of their ultimate configuration and placement than most non-linear projects. The Proposed Project may encounter unique topographical and natural features or site-specific engineering challenges along the power line ROW that could not be reasonably foreseen and specifically planned for in advance. The APMs take into consideration the potential for the Proposed Project to encounter such features and enhance SDG&E's ability to avoid or minimize future potential impacts on sensitive environmental resources.

The APMs allow for limited project design flexibility while avoiding or minimizing environmental impacts, to the extent feasible. Per CEQA, "feasible" is defined as being "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" while attaining the Proposed Project's basic objectives and its purpose and need.

3.11 IMPLEMENTATION OF APPLICANT-PROPOSED MEASURES

SDG&E would be responsible for overseeing the assembly of the construction and environmental teams that would implement and evaluate the Proposed Project APMs. SDG&E maintains an environmental compliance management program to allow for implementation of the APMs to be monitored, documented, and enforced during each Proposed Project phase, as appropriate. All those contracted by SDG&E to perform this work would be contractually bound to properly implement the APMs and ensure their effectiveness in reducing potential environmental effects.

Implementation of the proposed APMs would be the responsibility of the environmental compliance team. The team would include an environmental project manager, resource specialists, and environmental monitors. All APMs would be implemented consistent with applicable federal, state, and local regulations. The environmental compliance team would be responsible for inspection, documentation, and reporting SDG&E compliance with all APMs as proposed. As needed, environmental specialists would be retained to verify that all APMs are properly implemented during the construction phase.

If conditions occur where construction may adversely affect a known or previously unknown environmentally sensitive resource, or if construction activities significantly deviate from Proposed Project requirements, SDG&E monitors and/or contract administrators would have the authority to halt construction activities, if needed, until an alternative method or approach can be identified. Any concerns that arise during implementation of the APMs would be communicated to the appropriate authority to determine if corrective action is required or the concerns would be addressed on-site, as applicable.

As the proposed APMs are implemented, environmental monitors from SDG&E would be responsible for the review and documentation of such activities. Field notes and digital photographs would be used to document and describe the status of APMs, as necessary.

Figure 3-1: Project Location Map

Figure 3-2: Project Overview Map

Figure 3-3: Existing System Configuration One-Line Diagram

Figure 3-4: Proposed System Configuration One-Line Diagram

Figure 3-5: WPI Double Circuit Direct Buried

Figure 3-6: Type DC-X Double Circuit Foundation

Figure 3-7: WPI Single Circuit Direct Buried

Figure 3-8: YPI Single Circuit Foundation

Figure 3-9: Typical Underground Duct Bank