1. PROJECT DESCRIPTION

1.1 INTRODUCTION

The Miguel–Mission 230kV #2 Project (project) is proposed to relieve overload on various existing San Diego Gas and Electric (SDG&E) 138 kilovolt (kV) and 69kV transmission lines. The overload would occur during high levels of power import from new merchant generators being constructed or proposed for construction in the United States-Mexico border region. The project area is within San Diego County, as further described in Section 1.4.

1.2 PROJECT COMPONENTS

The project proposes three primary components, as described in the following sections and as depicted in Figure 1-1.

1.2.1 New 230kV Transmission Circuit

A new 230kV transmission circuit would be added to modified existing double circuit 138kV steel lattice tower structures currently supporting 69kV and 138kV circuits from Miguel Substation to Fanita Junction, and within a vacant position on existing double circuit 230kV structures from Fanita Junction to Mission Substation. The new 230kV circuit, rated at approximately 1,000 megawatts (MW), would provide a second 230kV circuit between SDG&E's Miguel and Mission Substations. Approximately 6 to 10 new steel pole support structures would be installed to route the new 230kV circuit into the Miguel and Mission Substations for interconnection and past Los Coches Substation. Finally, approximately 10 steel pole support structures would replace selected steel lattice tower structures where necessary for adequate structural support. No new right-of-way would be required for any new or replacement structures.

1.2.2 Relocated Existing 69kV and 138kV Transmission Circuits

Existing 69kV and 138kV transmission circuits currently supported by the existing 138kV steel lattice tower structures would be relocated onto a new pole line within the existing SDG&E right-of-way to provide a position for the new 230kV circuit. Construction of the relocated 69kV/138kV circuits would utilize both wood and steel double circuit pole structures and would run parallel to the new 230kV transmission circuit for approximately 24 miles within the existing SDG&E right-of-way from Miguel Substation to Los Coches Substation and from Los Coches Substation to Fanita Junction.

1.2.3 Substation Modifications

SDG&E’s existing Miguel Substation and Mission Substation would be modified to accommodate the new 230kV transmission circuit. New 230kV circuit breakers would be added with associated disconnects, steel, and protection. All proposed substation modifications would occur on existing utility-owned property and within the existing substation developed areas.

1.3 PROJECT LOCATION

Most, if not all, of the proposed new and relocated transmission facilities for the project would be installed in the existing SDG&E right-of-way between Miguel Substation to Los Coches Substation to Fanita Junction to Mission Substation, which is occupied by 69kV, 138kV, and 230kV transmission facilities. Some of the new steel pole support structures for the new 230kV circuit may be installed on SDG&E-owned substation property. The project is located within San Diego County and is generally described in Figure 1-1.

1.4 PROJECT ROUTE DESCRIPTION

The existing right-of-way within which the project is proposed for construction is located entirely within San Diego County and passes through the cities of San Diego and Santee, Marine Corps Air Station Miramar, and unincorporated areas in the eastern portion of the county. The proposed transmission facilities would be located entirely within the existing SDG&E right-of-way, or to a very limited extent within existing SDG&E-owned substation property. The terrain generally consists of rough foothills with steep valleys and ravines, with a few scattered commercial and residential areas. Vegetation in undeveloped areas consists primarily of chaparral, coastal sage scrub, and grassland, or sycamore/willow and oak woodlands in riparian areas.

The existing right-of-way begins at SDG&E's Miguel Substation located in Sunnyside, an unincorporated area of San Diego County, south of the Sweetwater Reservoir. Heading northeast from the substation, the existing right-of-way crosses the San Diego National Wildlife Refuge Otay-Sweetwater Unit before it traverses State Route 94 (Campo Road). The right-of-way then turns north where it crosses the Sweetwater River and runs through the Cottonwood at Rancho San Diego Golf Club course. Continuing north and northeast, the right-of-way travels near residential developments and through undeveloped areas in and around Cottonwood, Crest, Glenview, Johnstown and adjacent avocado groves—all unincorporated areas of San Diego County—before it crosses Interstate 8 south of Lake Jennings. Once north of Interstate 8, the right-of-way traverses commercial and residential development near the Lakeside area, as well as some undeveloped areas, before passing by SDG&E's Los Coches Substation.

The existing right-of-way continues north by the Los Coches Substation, crosses the San Diego River, and runs along the southerly boundary of Louis A. Stelzer County Park, where it turns west, crosses State Route 67, and continues through the residential portions of the community of Eucalyptus Hills and the City of Santee. Continuing west, the right-of-way crosses the Santee Lakes Regional Park and Campground and enters an undeveloped area, which includes the southeast corner of Marine Corps Air Station Miramar. After approximately 1 mile, the SDG&E right-of-way turns southwest at a point called Fanita Junction. The right-of-way crosses State Route 52 and traverses open space areas within Mission Trails Regional Park. After leaving the park, the existing right-of-way continues southwest near the community of Tierrasanta, adjacent to its northerly boundary, and then crosses the northeast corner of the Admiral Baker Golf Course, crosses Interstate 15 just north of Friars Road, and then turns west. The existing project right-of-way continues west through portions of Mission Valley located south of Mission Village

Figure 1-1

Project Overview Map

(see link on contents page)

Back-page placeholder for Project Overview Map

until it terminates at SDG&E's Mission Substation, located on the east side of Interstate 805 and north of Friars Road in the community of Mission Valley.

Figure 1-2 (map sheets 1 through 12) provides a detailed view of SDG&E's existing right-of-way, existing transmission facilities, and the transmission facilities proposed as a part of the project with proposed routing.

1.5 PROJECT SPECIFICATIONS

Table 1-1 summarizes the major facilities that would be installed as part of the project. The following sections fully describe these facilities and their locations, as well as construction methods.

1.5.1 New 230kV Transmission Circuit

Transmission Line Specifications

A new single-circuit 230kV transmission circuit generally would be installed on modified existing steel lattice structures currently supporting 69kV and 138kV circuits from Miguel Substation to Fanita Junction, and within a vacant 230kV position on existing structures from Fanita Junction to Mission Substation. Figure 1-3 shows how the existing 138kV steel lattice tower structures would be modified to accommodate a new 230kV circuit. Approximately 10 of the steel lattice tower structures between Miguel Substation and Fanita Junction would be replaced with steel pole support structures to provide adequate structure support. An estimated 6 to 10 new steel poles would be installed to route the new circuit into the Miguel and Mission Substations for interconnection and to route the circuit past Los Coches Substation. The new 230kV circuit would be located within SDG&E's existing right-of-way, which ranges from 150 feet to 250 feet in width. The distance between the modified existing transmission structures typically varies from approximately 1,000 feet to 2,000 feet, depending on topography, anticipated line sag, and required line clearance from existing terrain.

The new 230kV transmission circuit would carry three phases of electrical conductors (i.e., wires) and one overhead shield wire. The existing 138kV structures would be modified to carry the proposed 230kV electrical conductors in a vertical configuration. Preliminary analysis for the new 230kV transmission circuit indicates that from Miguel Substation to Fanita Junction each phase would consist of two 636-kcmil (1,000 circular mils) aluminum conductor steel support/alumoweld (ACSS/AW) bundled subconductors spaced 18 inches apart. For the new 230kV transmission circuit from Fanita Junction to Mission Substation, SDG&E would install bundled 1,033-kcmil aluminum conductor steel reinforced/alumoweld (ACSR/AW) conductors in the vacant position on the east side of the existing double circuit 230kV structures. The existing 230kV transmission circuit on the west side of the existing 230kV structures (Tie Line [TL] 23022) would be replaced with bundled 1,033-kcmil ACSR/AW to maintain existing power capacity (TL 23022 currently uses bundled 1,109-kcmil ACAR). Detailed engineering studies will be completed to determine the final conductor size and bundle configuration for all facilities. One new overhead shield wire would be installed from Miguel Substation to Fanita Junction.

Figure 1-2

(see links on contents page)

Table 1-1: Summary of Project Facilities

Project Facility	Description
One new Miguel–Mission 230 (kilovolt) kV circuit, including 138kV tower modifications and replacements, and new 230kV support structures	• Conductors: bundled 636-kcmil (1,000 circular mils) aluminum conductor steel support/alumoweld (ACSS/AW) from Miguel Substation to Fanita Junction and bundled 1,033-kcmil aluminum conductor steel reinforced/alumoweld (ACSR/AW) from Fanita Junction to Mission Substation, consisting of three phases and two subconductors per phase; such new circuits to be installed on modified existing or replacement structures, on the vacant position of existing 230kV structures, or on new steel pole support structures. (Engineering studies will be completed to finalize conductor size and bundle configuration.) • One new overhead shield wire from Miguel Substation to Fanita Junction • Minimum ground clearance: 30 feet • Estimated conductor diameter: 0.977 inch • Distance between subconductors: 18 inches • Estimated shield wire diameter: approximately 0.306 inch • Structure types: steel lattice tower structures and steel pole support structures • Structure heights: 45 to 150 feet • Approximate distance between structures: 300 to 3,500 feet • Total number of 138kV towers to be modified: approximately 80 • Total number of 138kV towers to be replaced with steel pole support structures: approximately 10 • Total number of 230kV structures with vacant positions to be used: approximately 45 • Total number of new 230kV steel pole support structures: 6 to 10. (Engineering studies will be completed to determine exact quantity.) • Proposed 230kV circuit length: approximately 35 miles

Project Facility	Description
Relocated Miguel Substation to Fanita Junction 69kV/138kV Circuits	• Conductor: one 636-kcmil ACSR/AW per phase to be located on new wood and steel pole support structures (Engineering studies will be completed to determine conductor size and bundle configuration, if needed.) • Structure type: new wood and steel poles • Structure height: 45 to 120 feet • Approximate distance between new structures: 300 to 3,500 feet • Total number of new structures: Approximately 110 to 115 from Miguel to Los Coches Substations and 25 to 30 from Los Coches Substation to Fanita Junction • Relocated line length: approximately 23.3 miles
Existing Miguel and Mission Substations	• New 230kV circuit breakers and switching equipment • Bus and support structures would be required • Control, protection, and communications equipment would be added

Modifications to Existing 138kV Structures

The proposed new 230kV transmission circuit would be installed largely on modified existing double-circuit, self-supporting 138kV steel lattice tower structures from Miguel Substation to Fanita Junction, as shown in Figure 1-3. The existing structures are currently designed for and support existing 69kV and 138kV circuits. To allow for proper electrical clearances for the new 230kV transmission circuit, SDG&E would remove and relocate the existing 69kV/138kV circuits and modify approximately 80 of these existing 138kV steel lattice tower structures. For most of these structures, modification work would involve replacing the structural arms with V-post brace 230kV insulators and structural improvement of steel lattice tower members. Overall tower height is not expected to change. A peak may be added to some towers to accommodate a static ground wire for lightning protection. Approximately 10 of the existing steel lattice tower structures would be replaced by steel pole support structures (for more details, see subsequent sections). The final engineering design will dictate the complete scope of modification work. The conductors for the proposed new 230kV circuit would be installed on the west side of the modified towers or replacement poles, leaving the east side of the support structures vacant.

New Structures

Approximately 10 of the existing 138kV steel lattice tower structures would be replaced to allow for higher wire tension loads of the proposed new 230kV circuit. In addition, approximately 6 to 10 new steel pole support structures would be installed to route the proposed new 230kV circuit for interconnection at the Miguel and Mission Substations and to route past the Los Coches Substation. (Engineering studies will be completed to determine the number of replacements

required and final design for wire tensions.) In these cases, galvanized steel pole support structures would be used, as shown in Figure 1-4. The exterior surfaces of all galvanized steel poles would be deglared (i.e., given a dull finish to reduce reflectivity). New steel pole support structures would be placed on reinforced concrete foundations, or may be direct buried. Where concrete foundations are required, the foundations would vary in size, but would be approximately 9 feet in diameter and 20 to 40 feet deep for each steel structure.

Existing 230kV Structures

Starting at Fanita Junction and heading southwest toward Mission Substation, SDG&E would install the new 230kV circuit in a vacant position on the east side of the existing 230kV steel lattice tower and steel pole support structures. Figure 1-4 depicts typical steel pole support and steel lattice tower structures. To more accurately describe the location of the existing 230kV structures and 69kV/138kV circuits, and the latter's proposed relocation alignment within the existing project right-of-way, SDG&E divided the project into several subsections, as shown in Figure 1-5.

The first nine 230kV structures heading southwest from Fanita Junction are double-circuit steel lattice tower structures with an existing 230kV circuit (TL 23022) on the west side, and the east side position vacant. The next 37 structures continuing southwest into Mission Substation are steel pole structures supporting the existing 230kV circuit (TL 23022) in a split-phase configuration, as shown in Figure 1-6.

1.5.2 Relocated 69kV and 138kV Transmission Circuits

Transmission Line Specifications

Proceeding north and east from Miguel Substation to Fanita Junction, SDG&E would relocate an existing 69kV and 138kV circuit from their current locations on either side of existing138kV steel lattice tower structures. The existing conductors for both the 69kV and 138kV circuits would be removed from the existing structures. SDG&E would relocate the 69kV and 138kV circuits by constructing new single wood and steel pole support structures in SDG&E's existing right-of-way and stringing new 69kV/138kV conductors for the relocated circuits. Each new 69kV/138kV pole structure would support three phases of 636-kcmil ACSR/AW conductors. These new double-circuit pole structures would vary in height from approximately 45 to 120 feet and would be spaced approximately 300 to 2,400 feet apart. The relocated 69kV/138kV pole circuits would parallel the proposed new 230kV circuit located on the modified existing 138kV structures within the existing right-of-way. No additional rights-of-way would be required to relocate the 69kV circuit or the 138kV circuit.

Location

The relocated 69kV/138kV circuits would be installed on new wood and steel pole support structures within SDG&E's existing right-of-way from Miguel Substation to Los Coches Substation (14.6 miles) and from Los Coches Substation to Fanita Junction (8.3 miles). To more accurately describe the location of the existing 69kV/138kV circuits and their proposed

Figure 1-3

Typical Modified 138kV Steel Lattice Tower Structure

(see link on contents page)

Figure 1-4

Typical Steel Pole Support Structure and Typical Lattice Tower Structure

(see link on contents page)

Figure 1-5

Project Subsection Map

(see link on contents page)

Figure 1-6

Existing and Proposed Cross-section of Subsection F

(see link on contents page)

relocation alignment within SDG&E's existing right-of-way, SDG&E divided the project into several subsections (refer to Figure 1-5).

Subsection A: Miguel Substation to 138kV Tower #28

Existing Configuration

Starting from Miguel Substation and heading north toward the Los Coches Substation, an existing 250-foot-wide right-of-way contains existing 138kV double-circuit structures supporting existing 69kV and 138kV circuits 62 feet from the west edge of the right-of-way; existing 230kV double-circuit structures supporting two 230kV circuits 97 feet east of the 138kV structures; and existing 69kV double-circuit structures supporting two 69kV circuits (TL 643 and TL 627) 10 feet from the east edge of the right-of-way, as shown in Figure 1-7a and Figure 1-7b. These last two 69kV circuits (TL 643 and TL 627) exit the right-of-way to the west at Towers #47 and #48, respectively, toward Jamacha Substation, and are not part of this project.

Proposed Relocation

The existing 69kV and 138kV circuits (TL 632 and TL 13824, respectively), which occupy both sides of the existing 138kV steel lattice tower structures, would be removed from the existing 138kV structures and relocated on a new double-circuit steel and wood pole line to be constructed in a position 12 feet from the west edge of the existing right-of-way until north of Tower #49, where the line would cross to a centered position between the two existing steel lattice tower lines until crossing again at Tower #40 to a position 12 feet from the east edge of the existing right-of-way, as shown in Figure 1-7c. TL 632 would occupy the east side of these new poles and TL 13824 would occupy the west side of these new poles.

Subsection B: 138kV Tower #28 to Tower #5

Existing Configuration

The existing right-of-way along this section is 200 feet wide starting just north of Tower #27. Heading north after Tower #27, the existing 138kV double-circuit tower line is located 50 feet from the west edge of the existing right-of-way, and a 230kV double-circuit tower line is 90 feet east of the 138kV towers, as shown in Figure 1-8a and Figure 1-8b. In addition, starting at Tower #26, another 69kV circuit (TL 6914) enters the existing right-of-way from the east and occupies a 69kV double-circuit structure line located 10 feet from the west edge of the existing right-of-way. TL 6914 enters the existing right-of-way at a point where a tap of the 69kV circuit (TL 632) exits the existing right-of-way west toward Granite Substation. After crossing Interstate 8 and just before Tower #10, another existing 69kV circuit (TL 678) enters the existing right-of-way from the east and heads north into Los Coches Substation.

Proposed Relocation

The existing 69kV and 138kV circuits (TL 632 and TL 13824, respectively) currently occupying both sides of the existing 138kV steel lattice tower structures would be removed and relocated onto a new double-circuit steel and wood pole line to be located 12 feet from the east edge of the existing right-of-way, as shown in Figure 1-8a. In addition to avoiding existing housing

developments west of Tower #27, this route should allow the positioning of the tap of 69kV TL 632 to utilize existing 69kV TL 6914 poles to cross the existing right-of-way and head west toward Granite Substation. Between Towers #11 and #12, the new pole line would then cross back into a position centered between the two existing steel lattice tower lines, as shown in Figure 1-8b.

Subsection C: 138kV Tower #5 to Los Coches Substation

Existing Configuration

This section consists of an existing 250-foot-wide right-of-way. Proceeding north after Tower #5, an existing 69kV pole line is located 10 feet from the west edge of the existing right-of-way; the existing 138kV double-circuit steel lattice tower structure line is located 50 feet from the west edge of the existing right-of-way; the existing 230kV double-circuit steel lattice tower structure line is located 90 feet east of the existing 138kV tower line; and an existing 69kV pole line is located 10 feet from the east edge of the existing right-of-way. Another existing 69kV circuit (TL 631) enters the existing right-of-way from the west and proceeds on the pole line along with the existing 69kV circuit (TL 6914) on the west side of the existing right-of-way, as shown in Figure 1-9.

Proposed Relocation

The existing 69kV and 138kV circuits (TL 632 and TL 13824, respectively), which occupy both sides of the existing 138kV steel lattice tower structures, would be removed and relocated onto a new double-circuit steel and wood pole line centered between the two existing steel lattice tower lines. The 69kV TL 632 would occupy the east side of these structures, and 138kV TL 13824 would occupy the west side of these structures, as shown in Figure 1-9.

Subsection D: Los Coches Substation to Tower #37

Existing Configuration

This section consists of an existing 200-foot-wide right-of-way. Starting from Los Coches Substation and heading north toward Fanita Junction, an existing 69kV wood pole line is located 10 feet from the west edge of the existing right-of-way; the existing 138kV double-circuit steel lattice tower structure line is located 70 feet from the west edge of the existing right-of-way; and the existing 230kV double-circuit steel lattice tower structure line is located 95 feet east of the existing 138kV structure, as shown in Figure 1-10.

Proposed Relocation

The existing 69kV circuit TL 638 that currently occupies the existing wood pole structures along the west edge of the existing right-of-way and the existing 138kV circuit TL 13821 that currently occupies the west side of the existing 138kV steel lattice tower structures would be removed and relocated onto a new double-circuit steel pole line located 12 feet from the west edge of the existing right-of-way. Location of the new steel pole support structures would match the current spans of the existing 138kV steel lattice tower structures. This span for span positioning is required to maintain adequate clearances to adjacent circuits and to minimize the need for new

access road construction. The relocated 69kV circuit, TL 638, would occupy the east side of the new pole line, and relocated 138kV circuit, TL13821, would occupy the west side of the new pole line. Conductor sizes for the relocated circuits would be 636-kcmil ACSR/AW and bundled 636-kcmil ACSR/AW for the circuits TL 638 and TL 13821, respectively.

The existing 69kV circuit (TL 635) occupying the east side of the existing 138kV steel lattice tower structures would be removed and relocated onto a new single-circuit steel pole line centered between the existing 138kV and 230kV towers for a short distance (two spans). This transition to the center of the existing right-of-way can be accommodated because of its very short distance, approximately three poles. Location of the new steel pole support structures would match the positioning of the existing 138kV steel lattice tower structures span for span. A wire size of 636-kcmil ACSR/AW would be used for the relocated 69kV circuit. The relocation of the 69kV circuit ends at Tower #37, where existing TL 635 exits the existing right-of-way to the north toward Creelman Substation.

Subsection E: Tower #37 to Fanita Junction

Existing Configuration

This section consists of an existing 150-foot-wide right-of-way. Proceeding west toward Fanita Junction, the existing 138kV double-circuit steel lattice tower structures are located 50 feet from the south edge of the existing right-of-way and the existing 230kV double-circuit steel lattice tower structures are located 65 feet north of the existing 138kV structures, as shown in Figure 1-11.

Proposed Relocation

The existing 69kV and 138kV circuits (TL 638 and TL 13821, respectively), which occupy both sides of the existing 138kV steel lattice tower structures, would be removed and relocated onto a new double-circuit steel pole line located approximately 12 feet from the south edge of the existing right-of-way. Location of the new steel pole support structures would match the location of the existing 138kV steel lattice tower structures span for span. Relocated 69kV, TL 638, would occupy the north side of these new steel pole support structures, and relocated 138kV, TL 13821, would occupy the south side, as shown in Figure 1-11. Conductor sizes would be 636-kcmil ACSR/AW and bundled 636-kcmil ACSR/AW for the circuits TL 638 and TL13821, respectively.

1.5.3 Substation Modifications

To accommodate the addition of the new 230kV transmission circuit, SDG&E would install additional equipment at the Miguel Substation, 7310 San Miguel Road, Bonita, and at the Mission Substation, 9060 Friars Road, San Diego. New equipment would include 230kV breakers, disconnects, and protection equipment. All substation modifications would occur on existing utility-owned property and within the developed substation areas.

Figure 1-7a

Existing and Proposed Cross-section of Subsection A (Tower #65–Tower #49)

(see link on contents page)

Figure 1-7b

Existing and Proposed Cross-section of Subsection A (Tower #49–Tower #40)

(see link on contents page)

Figure 1-7c

Existing and Proposed Cross-section of Subsection A (Tower #40–Tower #28)

(see link on contents page)

Figure 1-8a

Existing and Proposed Cross-section of Subsection B (Tower #28–Tower #12)

(see link on contents page)

Figure 1-8b

Existing and Proposed Cross-section of Subsection B (Tower #12–Tower #5)

(see link on contents page)

Figure 1-9

Existing and Proposed Cross-section of Subsection C

(see link on contents page)

Figure 1-10

Existing and Proposed Cross-section of Subsection D

(see link on contents page)

Figure 1-11

Existing and Proposed Cross-section of Subsection E

(see link on contents page)

1.6 CONSTRUCTION

The following section describes the proposed project construction procedures.

1.6.1 New 230kV Transmission Circuit

Access

Constructing the new 230kV transmission circuit would begin with the grading of existing roads and spur roads. Where replacement or new support structures are needed, existing roads or spur roads may need to be extended to facilitate access to the structure sites. New or extended access roads or spur roads would be contained within the existing right-of-way to the greatest extent feasible. Where this is not feasible, new easements or rights of entry may be required to access certain facility sites along the right-of-way. It is anticipated that maintenance to existing access roads or construction of new access or spur roads would be performed using a bulldozer, followed by blading to smooth the ground for vehicular and equipment traffic. Typically, 12-foot-wide straight sections of roadway, with wider sections at curves, are required to allow safe movement of construction equipment and vehicles.

Construction access roads across areas that require no future use for maintenance and operations would be removed and rehabilitated after construction is completed. In other areas, roads would be left in place to provide access to the new 230kV circuit for operation, maintenance and repair purposes. Gates would be installed where required at fenced property lines to restrict general vehicular access to the right-of-way.

Structure Sites

After access roads or spur roads are graded, clearing at individual structure sites would be required for any new and existing structure locations and for any modified or replacement structures between Miguel Substation and Fanita Junction to accommodate work around the structures. Clearing at individual structure sites would be done using a bulldozer to prepare the required area. It is anticipated that an area approximately 150 feet by 150 feet would be cleared for construction activities at each structure location. These cleared areas would provide a safe working space for placing equipment, vehicles, and materials.

Modifications to Existing 138kV Structures

As previously described, installation of the new 230kV circuit would require modifications to approximately 80 existing 138kV steel lattice tower structures from the Miguel Substation to Fanita Junction. Modification of the existing 138kV steel lattice tower structures for the installation of the new 230kV circuit would require replacing, adding, or modifying structural members. In these cases, a flatbed truck or helicopter would deliver steel members to each structure location. As much as possible, steel members would be bolted together and assembled on the ground. After assembly, replacement steel would be lifted into place with either a large crane or a helicopter.

New 230kV Structures

Approximately 10 of the existing 138kV steel lattice tower structures may need to be replaced by new 230kV steel pole support structures to allow for higher conductor tension loads. Foundations for the new 230kV steel pole support structures typically would be drilled concrete piers at the base of the lattice steel tower it replaces. The foundation process would start with the demolition of the lattice steel tower and the boring of one hole for each new steel pole support structure. The holes would be bored using truck-mounted excavators with various diameter augers to match diameter and depth requirements of the foundation sizes. At new structure sites where solid rock is encountered, additional equipment would be required to remove the rock from the desired excavation. This could include rock-hauling equipment or blasting.

The new steel pole support structures would typically require an excavated hole of 9 feet in diameter and 20 to 40 feet deep. Each foundation would extend above the ground line between 6 inches and 2 feet.

After excavation of the foundation holes, reinforcing steel cages would be installed and placement of concrete would follow. Reinforcing steel cages would be assembled at laydown yards and delivered to each new structure location by flatbed truck or helicopter. Typically, new steel pole support structures would require 40 to 100 cubic yards of concrete per foundation, depending on structure type.

New steel pole support structures would be assembled, erected, and bolted to the foundations. Steel members for each structure would be delivered to each location by flatbed truck or helicopter. Steel pole support structures would be bolted together and assembled on the ground. Assembly would be facilitated with a small truck-mounted crane or helicopter. After assembly, the pole would be lifted onto the foundation with a large crane or helicopter that would move along the existing right-of-way, as shown in Figure 1-12.

The construction contractor may choose to perform some or all of the structure-erection activities with a helicopter. Use of a helicopter for structure erection may be driven by various factors, including access to the structure locations, construction schedule, and/or construction economics.

If utilized, helicopter construction activities would be based at a project-material staging area and would include a fueling truck, maintenance truck, and operations crew to support the helicopter.

Conductor Stringing

Conductor and shield wire stringing for the new 230kV circuit would begin with installation of insulators and stringing sheaves. Sheaves are rollers, temporarily attached to the lower end of the insulators, that allow the conductor to be pulled, or “strung,” along the line. Temporary clearance structures, typically consisting of vertical wood poles with cross arms, as shown in Figure 1-13, may be installed at road crossings and at crossings of energized existing overhead electric and communications lines to prevent the 230kV conductors from sagging onto existing facilities during the stringing operation. The initial stringing operation would consist of pulling a “sock line” through the sheaves along the line.

Figure 1-12

Typical Transition Construction Activities

(see link on contents page)

Figure 1-13

Typical Basic Wire Handling Equipment

(see link on contents page)

Pulling the sock line is accomplished using a vehicle traveling along the right-of-way or, at the construction contractor's choosing, with a small helicopter flying the right-of-way. The sock line would then be attached to the conductor and used to pull the conductor into place using conventional tractor-trailer pulling equipment located at pulling and tensioning sites.

Pulling and tensioning sites are typically required approximately every 1 to 4 miles. It is anticipated that approximately 21 pulling and tensioning sites would be needed along the existing project right-of-way. The sites are needed to set up the tractors and trailers with the spooled reels that hold the conductors, as well as the trucks with the tensioning equipment. To the greatest extent practical, pulling and tensioning sites would be located within the existing project right-of-way and at historical pulling and tensioning sites. However, some pulling and tensioning sites may occur at non-historical locations and outside the existing project right-of-way. Each site would require clearing an area of approximately 1 to 2 acres. Depending on topography, some incidental grading may be required at pulling and tensioning sites to create level pads for equipment.

After installing the conductor and shield wire, sagging and clipping activities are performed. This process involves adjusting tension of the conductors and shield wires, removing stringing sheaves, and permanently attaching the conductor to the insulators with specialized hardware.

Cleanup and Restoration

At the conclusion of construction, the right-of-way would be cleaned of packing crates, hardware, and all construction debris. Disturbed areas not otherwise required for operation, maintenance, and repair would be restored, as described in Chapter 6.

Equipment

General equipment required for constructing the transmission line would include bulldozers, graders, backhoes, drill rigs, truck-mounted augers, flatbed trucks, boom trucks, rigging and mechanic trucks, air compressors and generators, rock-blasting equipment, small-wheeled cranes, man lifts, concrete trucks, and crew trucks. Assembling steel pole support structures or modifying/replacing existing steel lattice tower structures would require a larger crane. Stringing operations would require pullers, tensioners, and wire reel trailers. Helicopters may be used to string the sock line and to install poles or towers where other access to pole and tower sites is unavailable.

Staging Areas

It is anticipated that several staging areas, each approximately 2 acres in size, would be required for storing materials, construction equipment, and construction vehicles. Staging areas likely would be located at already disturbed/developed areas, such as existing substations, or in other disturbed/developed areas near the center and the endpoints of the existing project right-of-way. Where a suitable surface (e.g., asphalt) does not exist, the staging areas may need to be scraped by a bulldozer, and a temporary layer of crushed rock would be laid down to provide an all-weather surface.

After construction, the rock would be removed from staging areas and the area would be restored, as described in Chapter 6. SDG&E would negotiate with landowners for specific locations of the staging areas where not located on SDG&E owned property.

1.6.2 Relocated 69kV/138kV Transmission Circuits

Access

Relocating the existing 69kV and 138kV circuit on new double-circuit wood or steel pole support structures would begin with development of any necessary access roads or spur roads off existing access roads to new pole sites, excavating holes for wood poles, and installing foundations for the steel pole support structures. New easements or right of entry may be required to access certain points along the existing project right-of-way or to provide for pulling and tensioning or staging sites where necessary.

Structure Installation

After any necessary access roads and spur roads are regraded or established, clearing at new individual structure sites would be required to install the new wood and steel pole support structures. It is anticipated that an area approximately 100 feet by 100 feet would be cleared for construction activities at each new pole structure location. This would provide a safe working space for placing equipment, vehicles, and materials.

Holes for new wood pole structures typically would be 3 feet in diameter and range from 8 to 12 feet deep, depending on wood pole structure heights. The new wood poles would be placed into the holes, and the holes would be backfilled and compacted with the excavated material. Surplus excavated material would be placed around the pole or spread on adjacent access roads.

New steel pole support structures typically would require an excavated hole of 8 to 9 feet in diameter and 20 to 40 feet deep. After excavation of the foundation holes, reinforcing steel would be installed and concrete would be poured. Steel pole support structures would be assembled at each site and erected and bolted to the foundations. Some steel pole support structures may be direct-buried, which does not require reinforcing steel, but concrete would be placed as backfill and corrosion protection.

Conductor Stringing

Conductor stringing would begin with installation of insulators and stringing sheaves. Conductor stringing and tensioning and site cleanup and restoration would occur in a similar manner to that previously described for the 230kV transmission circuit.

Equipment

Equipment for the 69kV/138kV relocation would include all of the previously listed equipment for the new 230kV circuit.

1.6.3 Substation Modifications

At Miguel and Mission Substations, modifications would occur in areas already graded, surfaced, or otherwise developed. Construction work for the modifications would consist of placing new concrete foundations, extending electrical conduits for equipment power and control, and installing structures and equipment in already graded, surfaced, or developed areas.

Equipment required for substation modifications would include backhoes, drill rigs, concrete trucks, flatbeds, and crew trucks. Cranes, man lifts, portable-welding units, line trucks, and mechanic trucks also would be required. All vehicle and equipment staging areas would be contained within existing developed areas either inside or outside the substations.

1.7 PROJECT SCHEDULE

Table 1-2 summarizes SDG&E's general schedule for the project.

Table 1-2: Proposed Schedule

Project Phase	Period
Engineering, design, and permitting	November 2001 to June 2003
Construction	June 2003 to June 2005
Operation	June 2005

Construction of the new 230kV circuit would total approximately 20 months. A longer timeframe may be required to accommodate site restoration, implementation of biological mitigation measures, or delays due to inclement weather. The construction period to relocate the existing 69kV/138kV circuits would be approximately 12 months. At each substation, it would take an estimated 12 months to construct the substation modifications. It is possible that construction for some or all activities would run concurrently, and the total project construction time is expected to be 24 months.

1.8 PROJECT PROTOCOLS

In addition to the forgoing, the project description would incorporate the Project Protocols described in Appendix A. SDG&E would employ the Project Protocols as necessary, appropriate, and feasible through project design on construction, operation, maintenance, and repair to avoid or minimize potential environmental impacts. Chapter 6 fully details the project's potential environmental impacts and describes how and when the Project Protocols would be applied to avoid or minimize such impacts to a level of insignificance. Some Project Protocols have been incorporated into the project for general application while others would be applied on a case-by-case basis to the extent feasible.

Lineal electric infrastructure projects, such as Miguel–Mission 230kV #2, typically traverse multiple jurisdictional boundaries, natural resource features, and wildlife habitat types. Until final design and, indeed, in some cases until installation, utility projects remain more flexible in the definition of their ultimate configuration and placement than most non-lineal projects. The project may encounter unique geographical and natural features along the existing right-of-way, such as natural and wildlife resources, soils conditions, terrain, existing development, engineering hurdles, and existing and proposed land uses. The Project Protocols contemplate the potential for the project to encounter such unique features and enhance SDG&E's ability to modify or adjust the final design during the installation phase to maximize overall project feasibility, while avoiding or minimizing impacts to sensitive environmental resources.

The Project Protocols are designed to take advantage of project design flexibility by avoiding or minimizing environmental impacts, to the extent feasible. As defined in the California Environmental Quality Act (CEQA), "feasible" means 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 project's basic objectives, its purpose and need. (Pub. Res Code § 21061.1 and 14 CCR 15126.6.)

All of the Project Protocols are described in Appendix A. Their application to project activities as they relate to specific environmental resources, and their ability to provide the project the means to avoid or minimize potential environmental effects to a level of insignificance, is described in Chapter 6. Where application of Project Protocols to avoid or reduce the effect of a project activity to a less than significant level is not feasible, additional suitable mitigation measures to do so are also proposed in Chapter 6.

Of particular importance are the Project Protocols designed to avoid or minimize the project's potential effects on biological resources. In December 1995, SDG&E entered into an agreement with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) establishing SDG&E's Subregional Natural Community Conservation Plan (NCCP).

The NCCP was developed according to the federal and state endangered species acts and the state's Natural Community Conservation Planning Act. SDG&E's NCCP establishes a comprehensive, long-term, habitat-based agreement among SDG&E, USFWS, and CDFG for the management and conservation of multiple species covered in the plan and their habitat. As such, the NCCP provides protection for those species while allowing SDG&E to develop, install, maintain, operate, and repair necessary electric and gas utility facilities in the region.

The NCCP prescribes as "protocols" various protection, mitigation, and conservation measures SDG&E must implement as a part of its covered activities to ensure the survivability and conservation of the covered species and their habitat, according to applicable law. SDG&E has successfully completed over 1,000 utility projects under and in compliance with the NCCP, ranging from maintenance to new construction.

Under its NCCP, SDG&E consults with the USFWS and CDFG on certain projects or activities in natural areas by preparing "pre-activity surveys" that evaluate the scope and nature of

potential impacts in advance of construction or maintenance activities. The pre-activity survey, when submitted, initiates consultation with the USFWS and CDFG under established timeframes to identify potential impacts and feasible avoidance, minimization, and/or mitigation measures, as described in the NCCP.

The benefits to the public health, safety, and welfare through reliable and cost-effective utility service and the long-term management and conservation of covered species and their habitat made possible by a programmatic conservation plan, such as the NCCP, are enormous. SDG&E's NCCP directly applies to all components of the project, and the management and conservation of the biological resources within the project area. Indeed, the Project Protocols relating to biological resources for the project have been "borrowed" from the NCCP.

1.9 OPERATION AND MAINTENANCE

1.9.1 Transmission Lines

The operation and maintenance of the transmission facilities associated with the project includes equipment, access and spur road, and right-of-way inspection; maintenance; and repair activities. These activities will be both routine preventive maintenance and emergency procedures to maintain service continuity. Some of the inspection work may include the use of helicopters for aerial patrol of the facilities, as well as ground patrol. Routine inspections, land or aerial, take place annually at a minimum.

A working zone around all transmission structures would be required, and shall be kept clear of shrubs or other obstructions for purposes of inspection and maintenance. All vegetation that may interfere with access to structures shall be trimmed or removed as necessary. In addition, for reasons of safety and reliability, vegetation shall not be within 10 feet (horizontally) of any conductor or taller than 15 feet within the right-of-way.

1.10 PERMIT REQUIREMENTS

The California Public Utilities Commission (CPUC) is the lead agency for the project under CEQA. SDG&E is submitting this Proponent's Environmental Assessment (PEA) as part of its Application for a Certificate of Public Convenience and Necessity.

As needed, SDG&E would also obtain permits, approvals and licenses from the federal, state, and local agencies, as shown in Table 1-3.

Table 1-3: Permit, Approval, and Consultation Requirements

Permit, Approval, or Consultation	Action Requiring Permit or Consultation	Authorizing Agency		
		Federal	State	Local
Certificate of Public Convenience and Necessity	Construction of electric transmission facilities under Public Utilities Code Section 1001		California Public Utilities Commission	
Review of Committee for Land and Airspace Management Policy (CLAMP) to cross Marine Corps Air Station Miramar	Construction, operation, and maintenance on land under Marine Corps management	Naval Engineering Command		
Federal agency consultation with U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act; USFWS Biological Opinion and Statement	Construction, operation, and maintenance on federal land which may affect listed species or its habitat	Consultation with USFWS		

Permit, Approval, or Consultation	Action Requiring Permit or Consultation	Authorizing Agency		
		Federal	State	Local
Section 404 Permit, Clean Water Act (33 USC 1344) Section 10 Rivers and Harbors Act (33 USC 403)	Placement of dredge or fill materials in "waters of the U.S." Construction across navigable waters	U.S. Army Corps of Engineers		
Implementation of SDG&E's NCCP	Activities within NCCP coverage area	USFWS	California Department of Fish and Game (CDFG)	
1600 Streambed Alteration Agreement	Alteration of the natural state of any stream		CDFG	
Highway Crossing Permit	Construction, operation, and maintenance within, under, or over federal highway right-of-way	Meet criteria set by Federal Highway Administration on federal aid highways	California Department of Transportation (Caltrans)	
Encroachment Permit	Construction, operation, and maintenance within, under, or over state highway right-of-way		Caltrans	San Diego County, cities (ministerial)
General Permit for Storm Water Discharges Associated With Construction Activity (National Pollutant Discharge Elimination System [NPDES] permit)	Stormwater discharge associated with construction activities		State Water Resources Control Board/Regional Water Quality Control Board	Mandatory Local Government Ordinances