APPENDIX B

Project Description Details

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1 INTRODUCTION

The proposed action consists of Bureau of Indian Affairs (BIA) approval of a 25-year lease of land (with the possibility of a 13-year extension) between the Campo Band of Diegueño Mission Indians (Tribe) and Terra-Gen Development Company LLC (Terra-Gen), the developer, on the Campo Indian Reservation (Reservation) (Campo Lease). The proposed action would authorize the Campo Lease, allowing Terra-Gen to develop, construct, operate and ultimately decommission a renewable energy generation facility (Campo Wind Facilities) on land within the Reservation Boundary (Figure 1-1). The "Campo Wind Project with Boulder Brush Facilities" or "Project" for short, consists of both the Campo Wind Facilities on land within the Reservation and the Boulder Brush Facilities which are located on adjacent private lands within the Boulder Brush Boundary (Figure 1-1). Throughout this document, the term "On-Reservation" refers to anything within the Reservation Boundary (or Campo Boundary) while the term "Off-Reservation" refers to anything outside of the Reservation Boundary. The Project components and details regarding its construction, operation and maintenance, and eventual decommissioning are described herein for the largest development contemplated, Alternative 1: Full Build-Out Alternative – Approximately 252 MW.

As depicted in Figures 1-2 and 2-1A of Appendix E, the Campo Wind Facilities would be located within a corridor of approximately 2,200 acres of land (Campo Corridor) within the approximately 16,000 acres under the jurisdiction of the Reservation. As further depicted in Figures 1-2 and 2-1A of Appendix E, the Boulder Brush Facilities would be located within a corridor of approximately 500 acres of land (Boulder Brush Corridor) within the approximately 2,000 acres of Off-Reservation, private leased parcels adjacent to the northeast portion of the Reservation. The Boulder Brush Facilities would be under the land use and permitting jurisdiction of the County of San Diego (County). Collectively, the Campo Corridor and the Boulder Brush Corridor comprise the approximately 2,700-acre Project Site that is the subject of analysis in the Draft EIS. The total disturbed area within the Campo Corridor would be approximately 800 acres while the total disturbed area within the Boulder Brush Corridor would be approximately 200 acres.

The Boulder Brush Facilities consist of a portion of the Project's transmission and interconnection facilities that would be located within the Boulder Brush Boundary. The Boulder Brush Facilities would require at least one Major Use Permit (MUP) from the County of San Diego (County).

1.1 Components

The Campo Wind Facilities, identified below, are discussed in corresponding Sections A thru J below while the Boulder Brush Facilities are fully discussed in Section K below.

A. Wind Turbines

B. Access roads

C. Electrical collection and communication system
D. Collector Substation
E. O&M facility
F. Meteorological towers
G. Water collection and septic systems
H. Temporary concrete batch plant for use during construction
I. Temporary staging and parking areas for use during construction
J. On-Reservation gen-tie line
K. Boulder Brush Facilities

A. Wind Turbines

The Project would include up to 60 wind turbines within the Campo Corridor on the Reservation. Turbines would be arranged in accordance with applicable industry siting recommendations for optimum energy production and minimal land disturbance. Since wind turbine technology is continually improving, and the cost and availability of specific types of turbines vary from year to year, final Project specifications are not available; however, the following is representative for turbines that would be installed on the Campo Wind Project:

- Sixty wind turbines, rated approximately 4.2 MW in nameplate capacity per turbine
- Multiple tubular steel tower sections forming the towers
- Rotor diameter – up to 460 feet (approximately 230-foot-long blades)
- Foundation pedestal – approximately 20 feet in diameter and 6 inches above grade
- Hub height – up to approximately 374 feet
- Total height of turbine (highest point) – up to approximately 586 feet

Wind turbines would consist of three main physical components that are manufactured off site and assembled and erected On-Reservation during construction: the tower (composed of multiple sections), the nacelle (the component of the wind turbine that houses the main mechanical components), and the rotor (which consists of three blades mounted on a hub) (see Appendix E). All proposed turbines would be three-bladed, upwind, horizontal-axis wind turbines. Each turbine would be mounted on a concrete pedestal (approximately 20 feet in diameter and 6 inches above grade) supported by a permanent concrete foundation (approximately 70 feet in diameter and 10 feet deep). Each turbine would have a rotor and nacelle mounted on top of its tubular tower.

Turbine Tower

Each wind turbine tower would be a tubular conical steel structure. The bolting flange at the base of the tower would extend out from the tower wall approximately 0.5 feet, resulting in an outer diameter of approximately 20 feet for the bolting flange at the tower base. The tower would have an access door at its base and an internal ladder to the top of the tower at the nacelle. A service platform at the top of each tower section would allow for access to the tower connecting bolts for routine inspection. The tower would be equipped with interior lighting and a safety guide cable alongside the ladder. No ladders would be located on the outside of the structures. Towers would be painted off-white for aviation visibility and to provide corrosion protection. All turbine tower access doors would be locked to limit public access, with no fencing.

Nacelle

The nacelle is the component of the wind turbine that houses the main mechanical components, which consist of the drive train, gearbox, and generator. The nacelle would be equipped with an anemometer and a wind vane that signals wind speed and direction information to an electronic controller. An electric motor would rotate the nacelle and rotor to keep the turbine pointed into the wind to maximize energy capture. An enclosed, steel-reinforced fiberglass shell would house the nacelle to protect internal machinery from the elements.

Nacelle functions include yawing the nacelle into the wind and pitching the blades to either capture wind energy to make the rotor turn or stall the blades to stop the rotor when necessary. Independent electric drives in the rotor hub would rotate the angle of each blade according to wind conditions, which would enable the turbine to operate efficiently at varying wind speeds and reduce deterioration of the drive train in higher-wind conditions. Wind turbine rotors would be designed with an automatic braking mechanism that consists of electric-drive blade pitch systems on each blade of the wind turbine. Under normal operating conditions, braking is accomplished by feathering the blades out of the wind. Single feathered rotor blades are designed to slow the rotor, and each rotor blade would have its own back-up to provide power to the electric drive in the event of a grid line loss.

Wind turbines can operate 24 hours a day, 7 days a week. Blades typically begin to rotate and turbines begin to generate power in winds as low as 6.7 miles per hour, referred to as the cut-in speed, and are designed to operate in wind speeds up to approximately 56 miles per hour, referred to as the cut-out speed. At wind speeds faster than 56 miles per hour, blades rotate parallel to the wind (blades are fully feathered) and the wind turbine stops producing electricity. This braking system is linked to the wind turbine control system used to prevent over-speeding of the rotor. Each wind turbine would also be equipped with a mechanical brake located at the output shaft of the gearbox. This brake is only applied to prevent rotation of the machinery for certain service activities. Turbines can withstand sustained wind speeds of more than approximately 100 miles per hour.

Lighting

The developer would implement a lighting plan in accordance with current Federal Aviation Administration (FAA) standards (FAA 2016). An estimated 60% to 65% of the turbines would be designated for lighting with medium-intensity, dual red or white synchronously flashing lights for nighttime use and daytime use, if needed. These lights would have the minimum number of flashes per minute and the briefest flash duration allowable per current FAA standards to prevent congregation of night migrating birds (Evans et al. 2007). All pilot warning lights would light synchronously. The number of wind turbines that would be lit would be minimized, and determined by the FAA, with a maximum separation gap between lights of less than 0.5 miles (Larwood 2005). A low-voltage, shielded light on a motion sensor would be installed at the entrance door to each wind turbine at the base of the turbine tower for security purposes. Lights on the components other than turbines (e.g., O&M building, collector substation) would be motion sensitive rather than steady burning; lights would be installed in a "high-mounted light" manner and directed downward to minimize spill light.

B. Access Roads

Where feasible, the existing network of On-Reservation permanent roads would be used to access the Campo Wind Facilities during construction. In addition to the existing roads, additional roads would be constructed on the Reservation to provide access and circulation. Access road layout would involve approximately 15 miles of new roads. All of these roads, existing and new, are anticipated to be used for access to the Campo Wind Facilities over the life of the Project. Existing roads would be improved to accommodate construction equipment delivery and access. It is anticipated that approximately 15 miles of existing roads would need to be widened up to 40 feet during construction and then would be reduced to 24 feet after construction. Likewise, the width of the new roads would be up to 40 feet during construction and then reduced to 24 feet after construction. Access roads to the gen-tie pole structures would be 16 feet wide.

Upon completion of construction, all new roads more than 24 feet wide would be reduced to approximately 24 feet wide, and the edges of the existing roads would be restored and the existing roads would be returned to pre-construction widths. Along either side of new access roads, a 6-foot-wide vegetation management area would be maintained. Roads would be designed to prevent soil erosion and to maintain existing surface water runoff patterns. Wherever practicable, roads would be designed with a maximum grade of 10%, but in certain instances, grades may need to be steeper.

On-Reservation access roads would be constructed of native soils with decomposed granite and gravel, or similar suitable materials, to provide access in nearly all weather conditions. All roads would be constructed or upgraded in accordance with industry standards. Bulldozers and graders would be used to build and widen roads, and a water truck would be used for road compaction and dust control. Compaction requirements to build embankments for roads and compaction equipment would be determined by the geotechnical engineer of record for the Project.

Access roads would be maintained during O&M to prevent off-road detours due to ruts, mud holes, or other deterrents. Roads would be maintained as needed; it is anticipated that maintenance would occur twice per year, but more frequent maintenance would be performed if needed.

C. Electrical Collection and Communication System

The turbines would be connected to the Collector substation through a 34.5 kV underground Electrical Collection and Communication System (ECCS) within the Reservation. Depending on the turbine model selected, the electric energy produced by each wind turbine would be conducted through cables to either a transformer located inside the nacelle or through cables running down the inside of the wind turbine tower, through an underground conduit, to a pad-mounted transformer that would sit approximately 10 feet from the base of the wind turbine tower on a separate foundation or "pad." The pad-mounted transformers would be approximately 6.5 feet tall by 7 feet wide by 8.5 feet deep. The turbine transformers would transform power from the turbine output voltage to 34.5 kV. A generator step-up transformer would be used at each wind turbine to boost voltage to the 34.5 kV collection system voltage to deliver power within the Project site. This boost is necessary because the low-voltage power generated by the wind turbines (600 to 1,000 volts) is not suitable for distribution within the Project site, since it would require larger underground electrical collection cables and generate higher power losses. The transformer may be either contained within the wind turbine unit itself or pad-mounted next to the base of the wind turbine, depending on the particular turbine purchased. The manufacturer controls the location of the transformer within their design process. The 34.5 kV side of the pad-mounted transformer would be connected to a system of insulated and shielded underground cables, referred to as the underground ECCS. Generated electricity would move through the underground ECCS to the Collector substation on the Reservation.

Figure 2-3, On-Reservation Collector Substation Design, in Appendix E, shows a typical configuration of an ECCS circuit. Approximately 28 miles of underground ECCS cable would be installed in temporary trenches in order to connect each wind turbine to the collector substation. There would be three cable conductors, one grounding wire, and one fiber-optic cable installed per trench approximately 4 feet below grade. A red warning tape printed with "Buried Cable" or similar would also be placed in the trench above the cables, approximately 1 foot below grade. The underground ECCS would be routed to minimize the overall cable length required for the Project and to lessen the temporary impacts associated with the trenching. For example, cables would be routed in parallel and/or adjacent to access roads to the extent feasible. However, in some cases, trenches would run overland from the end of one turbine string to an adjacent string. Each trench would be approximately 2 to 4 feet wide and 4 feet deep. An additional, approximately 24 feet of temporary disturbance alongside the trench would be required to account for trenching equipment and temporary placement of excavation.

Depending on the terrain, an approximately 40-foot-wide area may be required to install portions of the underground ECCS cables using a combination of trenching, open excavation, and directional boring. In addition, certain areas may not be feasible for trenching due to solid rock, large boulders, or subsurface resources. In these instances, a temporary worksite 15 feet to 20 feet wide may be required to enable construction of overhead ECCS circuits. These overhead circuits would be supported on steel/concrete/wood monopoles up to 60 feet in height that would be spaced approximately 450 feet apart. Junction boxes for access to underground cables for inspection, maintenance, and repair would be installed at approximately 0.2-mile intervals. Once installed, the disturbed areas would be revegetated with a native seed mix.

D. Collector Substation

The underground ECCS would be routed to a new Collector substation centrally located within the Campo Corridor on the Reservation. This Collector substation would be located in a yard approximately 1 acre in size. Transformer and switching equipment within the collector substation would be approximately 25 feet tall. Figure 2-3 (Appendix E) shows a typical layout design for the Collector substation. Lighting at the collector substation would be provided for safety and security purposes. The collector substation would be enclosed by an 8-foot-tall chain-link fence with locked gates. The Collector substation would contain the main transformer for the Project and circuit breakers for each of the underground ECCS circuits. Electricity at 34.5 kV from the wind turbines would flow into the circuit breakers, be transformed by the transformer to 230 kV, and would then be conducted for delivery via the gen-tie line.

All Collector substation monitoring and control functions would be performed remotely. Warning signs would be posted and entry to the Collector substation would be restricted to authorized personnel.

E. O&M Facility

An O&M facility would be located within one of the two temporary central staging areas within the Campo Corridor on the Reservation. The facility would include a 1.5-acre parking and equipment storage area and a pre-fabricated structure (see Figure 2-4, O&M Building (Appendix E)). The O&M facility would contain monitoring and control equipment. Amenities would include a main building with offices, spare parts storage, restrooms, a shop area, outdoor parking facilities, a turnaround area for larger vehicles, outdoor lighting, and gated access with partial or full perimeter fencing. Permanent outdoor nighttime lighting for operations would be kept to the minimum required for security and safety, and all lighting would be hooded, directed downward, and turned off when not required. Security fencing (6 feet tall) would be installed around the perimeter of the O&M facility. Downcast lighting would be installed around the perimeter of the facility for safety and security and would be motion sensitive rather than steady burning. In addition, an electrical heating, ventilation, and air conditioning system; a fire suppression system; and groundwater well would be installed for the O&M facility for the permanent O&M staff who would operate from this facility. It is anticipated that on-site groundwater would be used for the Project's operation, otherwise water would be trucked in from Jacumba Community Services District (JCSD) or Padre Dam Municipal Water District (PDMWD). The O&M facility would require a potable water source for employee uses for the restrooms (regular and compliant with the Americans with Disabilities Act), a kitchen sink, and emergency wash station. A parking area for O&M staff and a staging area would also be located within the fenced, access-controlled O&M facility site. The facility would normally be staffed on a daily basis, and security personnel would patrol the facility. A septic system is proposed to provide sewer service to the O&M facility during operation. The septic system would be sufficient to provide service for employees and would include a leach field located adjacent the O&M facility, where traffic would not occur. Estimated water use and wastewater generation would be approximately 210 gallons per day (gpd) each.

F. Meteorological Towers

Up to three permanent met towers would be constructed within the Campo Corridor on the Reservation to monitor and record weather conditions and to perform power performance testing of the wind turbines. The height of these met towers would be equal to hub height of the wind turbines. They would be un-guyed[1], self-supporting, lattice structures mounted on an approximately 26 feet by 26 feet concrete foundation. The towers would be enclosed within an approximately 50-foot by 50-foot perimeter by an 8-foot-tall chain-link fence with locked gates. Lighting for the met towers would consist of marker lighting pursuant to FAA requirements, and would employ strobed, minimum-intensity lights as recommended by the U.S. Fish and Wildlife Service (USFWS 2016).

Up to six temporary met towers would also be erected within the Campo Corridor on the Reservation as part of the Project's wind turbine power curve testing campaign that would occur prior to commercial operations. These temporary met towers would be constructed atop targeted wind turbine locations (after site grading but prior to the erection of those wind turbines) to collect

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1 Guy-wires are high-tensioned cables that are both lightweight and strong to support structures such as wind turbines. Also known as a guyed wire, guy-cable, guy-strand, and guy-anchors.

turbine-site-specific wind data that would be used to calibrate these locations prior to performing power curve testing. The height of these met towers would also equal the hub height of the wind turbines to be installed and would be equipped with applicable FAA-compliant marking and lighting for aviation safety. The temporary met towers would be guyed lattice towers constructed atop a relatively smaller, temporary concrete foundation. These met towers would be removed prior to the erection of the turbines and upon collecting sufficient site-specific wind data.

Each met tower would have instrument booms and cabling for all meteorological instruments, ladders, FAA lighting, and other instruments that may be required. The permanent met towers would initially be powered by a battery/solar panel combination installed at the base of each tower. Once the Project has reached commercial operation, the permanent met towers would be supplied power and fiber-optic cabling from the nearest turbine so that the SCADA could collect the data from the tower. A dedicated road would provide access to each permanent met tower from the nearest Project road access point. Meteorological instruments would be mounted on both the permanent and temporary met towers at various heights, up to the top of each tower.

G. Water Collection and Septic Systems

As stated above, the O&M facility would have an operational water demand of approximately 210 gpd for the sanitary functions associated with personnel and any landscaping components. The source of water during operation would be connection to existing On-Reservation facilities in the vicinity of the proposed O&M building. Operational water demand is generally consistent with the connection and sizing necessary for a single-family home.

H. Temporary Concrete Batch Plant for Use During Construction

A temporary concrete batch plant would be established within the Campo Corridor on the Reservation to mix the necessary concrete for foundations of the turbines, Met towers, substations, transmission poles, and the O&M facility. The concrete batch plant would occupy an area of approximately 400 feet by 400 feet, or 3.7 acres within the Campo Corridor. The concrete batch plant would consist of a mixing plant, areas for aggregate and sand stockpiles, driveways, truck load-out area, and turnaround(s). The concrete batch plant would include cement storage silos, water and mixture tanks, aggregate hoppers, conveyors, and augers to deliver different materials to the mixing plant. The batch plant would be located just off an access road.

I. Temporary Staging and Parking Areas for Use During Construction

Temporary staging areas have two uses: as central staging and as turbine staging. Two temporary staging areas within the Campo Corridor on the Reservation of approximately 20 acres total would be established for construction-management facilities, material storage, equipment storage, and worker parking. Vehicle parking would be clearly marked and limited to areas away from sensitive habitat. Upon completion of construction, the O&M facility would be located within one of the staging area footprints. In addition to the central temporary staging areas, each turbine would require a temporary staging area at the turbine location for the assembly of the turbine components and to erect each turbine. Each temporary staging area for a turbine would be approximately 100 feet by 200 feet, plus clearing for blades.

J. On-Reservation Gen-Tie Line

The Project includes an approximately 8.5-mile 230 kV gen-tie line. Approximately 5 miles of the gen-tie line, including 42 support poles, would be located within the Campo Corridor on the Reservation, as part of the Campo Wind Facilities. The On-Reservation gen-tie line includes the crossing of Interstate (I) 8. The other approximately 3.5 miles of gen-tie line Off-Reservation is included in the Boulder Brush Facilities.

K. Boulder Brush Facilities

The Boulder Brush Facilities include the following components:

1. Off-Reservation gen-tie line
2. High-voltage substation
3. 500 kV switchyard and connection to the existing SDG&E Sunrise Powerlink
4. Access roads
5. Defensible space (fuel modification zones)

The Boulder Brush Facilities would be located within the approximately 500-acre Boulder Brush Corridor within approximately 2,000 acres of leased private lands. Approximately 200 acres of land within the Boulder Brush Corridor would be disturbed with the implementation of the Boulder Brush Facilities. With the exception of the incoming and outgoing connection lines that connects the 500-kV switchyard to the Sunrise Powerlink, which would be constructed, owned, and operated by SDG&E, the Boulder Brush Facilities are subject to MUP requirements from the County for construction and operation. Because the incoming and outgoing connection lines would be constructed by SDG&E, they are subject to the requirements of the California Public Utilities Commission's General Order 131-D.

The Boulder Brush Facilities would be located in the McCain Valley area of the unincorporated County, north of the community of Boulevard and I-8. Regional access would be provided by I-8. Local access would be provided by Ribbonwood Road. The private properties through which Boulder Brush Facilities would extend currently consist of largely undeveloped ranch land, a portion of which is grazed by cattle and a portion of which is used by off-road recreational vehicles. The affected parcels are surrounded by the following uses: existing nearby wind turbine facilities

(Kumeyaay Wind, which is located on the Reservation, and Tule Wind, located 1 mile to the west, north and east of the Boulder Brush Facilities), transmission infrastructure (Sunrise Powerlink), and a small number of rural residential homes. The Sunrise Powerlink crosses the northeast portion of these parcels. The Kumeyaay Wind facilities are located to the west and Tule Wind facilities are located to the west, north, and east of the Boulder Brush Facilities.

1. Off-Reservation Gen-Tie Line

Approximately 3.5 miles of the overhead 230 kV gen-tie line that would transmit the electricity from the Campo Wind Facilities to the Off-Reservation high-voltage substation and switchyard would be constructed within the Boulder Brush Corridor as part of the Boulder Brush Facilities on private lands within the County and would, therefore, be subject to at least one MUP. This segment of the gen-tie line would require approximately 32 steel pole structures that, in addition to the transmission wires, would accommodate a fiber-optic ground wire attachment for lightning protection and internal communications. The height of the steel pole structures would vary by location, up to a maximum height of 150 feet.

2. High-Voltage Substation

The high-voltage substation would be constructed within the Boulder Brush Corridor and located adjacent to the proposed 500 kV switchyard at the northern portion of the privately-owned parcels. This high-voltage substation would receive the electric energy transmitted from the Campo Wind Facilities along the 230 kV gen-tie line and convert it up to the 500 kV voltage via a 230 kV to 500 kV transformer before transmitting it onward to the adjacent switchyard.

The high-voltage substation equipment would include transformers that would be connected through circuit breakers to a jumper link located within the fenced boundary of the high-voltage substation to deliver power to the point of interconnection at the adjacent switchyard. The high-voltage substation would include a control house and a parking area for utility vehicles. The high-voltage substation would generally be an unstaffed facility, except in cases of maintenance and repair activities. The cleared area surrounding the high-voltage substation and the area inside the high-voltage substation fence would be covered with gravel. An eight-foot tall security fence consisting of 6-foot-tall chain-link fencing topped with an additional 2 feet of security wire would be installed around the perimeter of the high-voltage substation site. A 30,000-gallon water tank dedicated for firefighting purposes would be installed at the high-voltage substation. The high-voltage substation would include a contiguous fuel modification zone from 100 feet outside the perimeter fence inward onto the pad area. The high-voltage substation pad area would be free of vegetation around all electrical equipment. The high-voltage substation fence and the gravel area within the fence would be grounded. The high-voltage substation would require a fenced-in footprint of approximately 220 feet by 320 feet (1.6 acres). An additional, approximately 1.0-acre area of disturbance would be required for site grading and clearing around the perimeter of the fenced-in footprint. The total disturbed area associated with the high-voltage substation would be approximately 2.5 acres.

Most high-voltage substation equipment would feature a low-reflectivity finish to minimize glare. Dull-colored insulators would be used to minimize visibility. Outdoor nighttime lighting at the high-voltage substation would be kept to the minimum required for security and safety, and all lighting would be hooded, directed downward, and turned off when not required. Some of the perimeter lighting would remain on all night for safety purposes, though shielded and directed towards accesses or signs.

The high-voltage substation would allow for the receiving and stepping up of electric energy from 230 kV to 500 kV for the Torrey Wind Project, a separate wind energy project proposed on private lands under County jurisdiction and located northeast of the Reservation. If both the Project and the Torrey Wind Project are approved, using the high-voltage substation for both projects would reduce the overall environmental impacts of the two wind projects. If only the Project is approved the high-voltage substation would be constructed to serve only the Project. Similarly, if only the Torrey Wind Project is approved, the high-voltage substation would be built to serve only the Torrey Wind Project.

3. 500 kV Switchyard and Connection to Existing SDG&E Sunrise Powerlink

A new 500 kV switchyard would be constructed within the Boulder Brush Corridor adjacent to the proposed high-voltage substation and transferred to SDG&E for its ownership, operation, and maintenance upon completion and acceptance. The switchyard would interconnect the Project to the existing Sunrise Powerlink by a ring bus design with three 500 kV breakers, a control house, and a fenced-in graveled area. The connection to the Sunrise Powerlink would be made through incoming and outgoing connection lines to be constructed by SDG&E that would effectively route the power through the ring bus, and the Project's point of interconnection would be at an open position on that same bus.

The switchyard would require a fenced-in footprint of approximately 400 feet by 750 feet (6.9 acres). An additional approximately 9.5 acres of disturbed area would be required for the access road, incoming/outgoing connection lines, 0.6-acre retention pond, a 30-foot fuel modification zone around the perimeter of the switchyard, and site grading and clearing. Therefore, the total disturbance area for the switchyard and in/out lines would be approximately 16 acres. The combined total disturbance area proposed for the high-voltage substation and switchyard would be approximately 18.5 acres.

An approximately 40-foot gap between the perimeter fence on the eastern side of the high-voltage substation and the perimeter fence on the western side of the switchyard would contain a transmission line pole structure supporting an overhead 500 kV line that would connect the high-voltage substation to the switchyard. The transmission line pole structure between the switchyard and the high-voltage substation and the transmission line on the switchyard side of the line between the switchyard and high-voltage substation would be maintained by SDG&E.

The incoming and outgoing connection lines (approximately 1,000 feet in length) that connect the switchyard to the Sunrise Powerlink would be constructed, owned, and operated by SDG&E. As with the high-voltage substation, the switchyard would also provide interconnection for the Torrey Wind Project currently under consideration by the County. If both the Torrey Wind Project and the Project are approved, using the switchyard for both projects would reduce the overall environmental impacts of the two wind projects. If only the Project is approved, the switchyard would be constructed to serve only the Project. Similarly, if only the Torrey Wind Project is approved, the switchyard would be built to serve only the Torrey Wind Project.

4. Access Roads

Where feasible, the existing network of permanent roads within the Boulder Brush Boundary would be used to access the Boulder Brush Facilities during construction. New access roads within the Boulder Brush Boundary would also be constructed to provide access and circulation to the Boulder Brush Facilities.

Primary access to the Boulder Brush Facilities would continue to be provided from I-8, with local access provided via Ribbonwood Road

An approximately 1-mile segment of Ribbonwood Road (outside of the Boulder Brush Boundary) from Opalocka Road/Ribbonwood Road to the Boulder Brush Facilities site entrance off Ribbonwood Road would be improved. The existing 1-mile unpaved road segment ranges from 12 feet wide to 40 feet wide, and would be widened to 30 feet and paved, to allow sufficient access. This 30-foot paved road would continue on site for approximately 4 miles up to the high-voltage substation and switchyard site. The off-site and on-site segment of this roadway would be privately maintained.

The approximately 4 miles of access roads leading to the approximately 32 gen-tie pole structures would be 16-foot-wide dirt/decomposed granite. An approximately 20-foot-wide fuel modification zone would be maintained on either side of the on-site primary access road for the Boulder Brush Facilities.

5. Defensible Space (Fuel Modification Zones)

Fire protection measures are defined in County Code Regulatory Ordinance, Title 9, Division 6, Chapter 1, County Fire Code. The regulations identify access road requirements and fuel modification zone requirements.

County Code, Section 96.1.503.1.1, specifies that "approved fire apparatus access roads shall be provided for every facility, building, or portion of building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend within 150 feet of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility." Exceptions are as follows:

> **Exceptions:** The fire code official may increase the 150-foot minimum where:
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> 1. Fire apparatus access roads cannot be installed because of topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
> 2. There are no more than two Group R-3 or Group U occupancies.

County Code, Section 96.1.202, defines a fuel modification zone as a strip of land where combustible vegetation has been thinned or modified or both and partially or totally replaced with fire-resistant and/or irrigated plants to provide an acceptable level of risk from vegetation fires. Fuel modification reduces the radiant and convective heat on a structure and provides valuable defensible space for firefighters to make an effective stand against an approaching fire front.

Permanent access roads would be constructed to provide access to the high-voltage substation and switchyard. County Code, Section 96.1.4907.2.1, specifies fuel modification of combustible vegetation from sides of roadways. Details regarding the extent of defensible space and fuel modification zones will be determined prior to final design with the input of relevant fire authorities. The Fire Authority having jurisdiction may require a property owner to modify combustible vegetation in the area within 20 feet from each side of the driveway or a public or private road adjacent to the property to establish a fuel modification zone. The nearest fire station, California Department of Forestry and Fire Protection (CAL FIRE) Boulevard, is located just south of I-8, off of Ribbonwood Road.

1.2 Construction

Construction of the Project is anticipated to require approximately 14 months. Some portions of Project construction would likely take place simultaneously at the Campo Wind Facilities and Boulder Brush Facilities. Operations are scheduled to begin in fall 2020.

The development footprint would be confined to the minimal amount of area necessary for construction and safe and reliable operation. Development of new access routes would be limited to the maximum extent practicable. All construction areas, staging areas, and access roads would be clearly delineated in the final engineering plans.

Work Force: Construction of the Project would involve up to 501 construction workers on a daily basis. Construction would begin with site preparation and construction fencing/markers to delineate the extent of construction disturbance areas; installation of civil improvements, including temporary staging areas for turbine deliveries; construction of access roads; installation of the underground runs for electrical cabling; construction of turbine, Met tower, transmission pole, and transformer foundations; and preparation of crane pads for erection of the turbines. Installation of electrical hardware (including cabling), construction of the collector substation, placement of the pad-mount transformers (if required), construction of the O&M facility, and erection of the turbines would follow. The final phase would include the completion of all wind turbine generators, high-voltage substation, and other facilities (including the gen-tie line and switchyard); followed by commissioning and testing of each turbine, the substations, utility interconnection, and electrical system; and restoration of the temporary construction areas, staging areas, and turbine crane pads. Approximately 3 months of commissioning or testing would then be undertaken.

Construction Communication and Contacts: The ability to communicate with personnel working on the Project site is mandatory. The site safety officer and construction crews would be required to have a satellite phone, and/or radios that are operational within the area of work to report an emergency. Any radio units used during construction would comply with Federal Communications Commission's rules and regulations. Contact information for lead construction personnel would be provided to respective agencies. Communication pathways and equipment would be tested and confirmed operational each day prior to initiating construction activities. Fires and medical emergencies would be immediately reported to the Emergency Communication Center for San Diego County Fire Authority/CAL FIRE/Campo Reservation Fire Protection District.

Each on-site worker would carry at all times a laminated card listing 24-hour contact information, including telephone numbers for reporting an emergency and immediate steps to take if an incident occurs. Information on the card would be updated as needed and redistributed to workers before the initiation of any construction activities. The cards would be handed out by the site safety officer prior to construction kickoff so site staff can be provided training and receive their cards.

Additionally, the developer would oversee the preparation of an Environmental Health and Safety Plan in compliance with OSHA requirements, which would include identification of potential construction-related hazards, required personal protective equipment, work zones, safety considerations for site construction activities, as well as protocols regarding communications, accident or incident reporting, emergency response, and emergency medical treatment. As such, the Project would be in compliance with and Project employees and contractors would adhere to the emergency response procedures in the Environmental Health and Safety Plan.

Materials and Equipment: Construction equipment would consist of standard construction equipment such as graders, bulldozers, excavators, trenchers, backhoes, cranes, forklifts, delivery trucks (including concrete), semi-trucks, pick-up trucks, and sport utility vehicles. Table 2-1 lists construction equipment commonly associated with the construction and installation of wind facilities.

Table 2-1
Construction Equipment and Vehicles

Equipment	Use
Air compressors	Provide compressed air for vehicles
Cranes	Lifting turbine materials for installation
Generator sets	Provide electricity and lighting
Graders	Road and pad construction
Pavers	Road construction
Paving equipment	Road construction
Pumps	Pumping water to various sites within the Project Site
Rollers	Road and pad compaction
Rough-terrain forklifts	Lifting equipment and pre-erection assembly
Track dozers	Road and pad construction
Scrapers	Road construction preparation
Tractors/loaders/backhoes	General use
Trenchers	Digging trenches for underground utilities
Welders	Assembly
Water trucks	Compaction, erosion, and dust control
Delivery trucks	Hauling road and pad material

Construction Timing: Campo Wind Facilities construction would generally occur within the hours of 7:00 a.m. to 7:00 p.m.; however, some delivery activity at nighttime to accommodate requirements by California Department of Transportation (Caltrans) and/or the California Highway Patrol is expected. When activities on the Reservation must occur at night, all Project lighting (e.g., staging areas, equipment storage sites, roadway) would be directed downward and away from natural vegetation communities. Boulder Brush Facilities construction activities would occur during the County's allowable hours of operation (i.e., 7:00 a.m. to 7:00 p.m.), 6 days per week, but may involve extended hours as needed during emergencies or as approved by the County. For example, placing concrete is dependent on temperature and so this activity could be shifted to early morning depending on forecasted temperatures. Generally, all employees would arrive within the morning peak hour and depart within the evening peak hour, and delivery truck trips would be distributed evenly throughout the 12-hour-shift day, between the hours of 7:00 a.m. and 7:00 p.m.

Site Preparation: Prior to construction, the limits of construction disturbance areas along roads, the electrical collection system, and at turbine locations would be clearly defined. These limits would be staked and flagged, and other construction delineation methods would be employed for the road alignment and turbine construction. Where necessary, the limits of the rights-of-way would be flagged. All construction activities would be confined to these areas to prevent unnecessarily affecting sensitive areas. If necessary, sensitive resource avoidance areas would be flagged to further ensure protection from construction activities.

Site Clearing, Grading, and Excavation: Construction would begin with vegetation clearing for the central staging areas. This would be followed and somewhat overlapped by clearing and grading of the new road alignments. Grading and vegetation clearing would take approximately 3 months with other phases occurring once access to that area is established, such as concrete batch plant set-up, while road grading continues. Vegetation would be cleared beginning with the areas necessary for access roads. As road grading progresses and Project features such as the temporary concrete batch plant, substation, and turbine sites become accessible, vegetation would subsequently be cleared from those areas. Cleared vegetation would be removed from the site and mulched for off-site reuse. Construction of components would begin with the establishment of one or both of the central staging areas.

Clearing and grading would be necessary for new access roads, widening existing access roads, turbine pads, Met tower pads, transmission poles, the O&M facility, the collector substation, the high-voltage substation, and the temporary concrete batch plant and staging areas. Clearing and grading would be accomplished using bulldozers, road graders, or other standard earthmoving equipment. Excavation would be necessary for foundations and ECCS construction, and would be accomplished using large excavators, backhoes, and trenching machines.

Construction of the Campo Wind Project would rely on existing roads to the extent possible. Any new roads would minimize excessive grading and impacts to road embankments, ditches and drainages. Roads would be located away from dry washes and drainage bottoms to the greatest extent feasible and would be designed to minimize surface water runoff and erosion and use the flow of the natural contours. The cut and fill required for the access roads would be balanced on site.

Construction Activities, SWPPP, and Erosion Control: A stormwater pollution prevention plan (SWPPP) would be prepared for the Project as part of the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Storm Water Discharges, and would document the selection, design, and installation of storm water control measures, which could include the following:

- Silt fences, straw bales, fiber rolls, sedimentation ponds, and rainfall diversion ditches
- Restoration of all temporarily disturbed areas to include recontouring the area; stockpiling and then reapplying topsoil; and reseeding the area with a mixture of native grasses, forbs, and shrubs

- Installation of silt fences and/or straw bales at road drainage outlets to prevent soil erosion and drainage into watercourses
- Strategic placement of stockpiled materials (e.g., debris, excess soil) such that it cannot reach watercourses

Final Road Grading, Erosion Control, and Site Cleanup and Stabilization: Once construction is complete, all disturbed areas would be graded to the approximate original contour, and any remaining trash and debris would be properly disposed of offsite. Areas disturbed during construction would be stabilized and reclaimed using appropriate erosion control measures, including site-specific contouring, reseeding, or other measures designed and implemented in compliance with a SWPPP and a revegetation and habitat management plan, once developed for the Boulder Brush Facilities and separately for the Campo Wind Facilities. Upon the completion of Boulder Brush Facilities construction, the existing land use would be able to continue with minimal impacts from the Project. Upon the completion of construction of the Campo Wind Facilities, existing land uses would be able to continue with minimal impacts.

During final road grading, surface flows would be directed away from cut-and-fill slopes and into ditches that outlet to natural drainages. The developer would prepare and implement a SWPPP, which would include standard sediment control devices (e.g., silt fences, straw bales, netting, soil stabilizers, check dams) to minimize soil erosion during and after construction. Waste materials would be disposed of at approved and appropriate landfills. Following construction, the developer would ensure that all unused construction material and waste is picked up and removed.

Contractors would provide trash barrels or dumpsters to collect all construction waste for proper disposal at an approved facility, as well as recycling bins for plastics and aluminum cans. No waste disposal by incineration would occur. The O&M facility would be used to store parts and equipment needed for O&M. The developer would inspect and clean up the Project development footprint following construction to ensure that no solid (e.g., trash) or liquid (e.g., used oil, fuel, turbine lubricating fluid) waste was inadvertently spilled or left on site.

Cleanup crews would patrol the construction site on a regular basis to remove litter. Final site cleanup would be performed prior to shifting responsibilities to O&M staff. O&M staff would use on-site (on-Reservation) dumpsters and recycling bins for daily waste and recyclables.

Testing and Commissioning: Project testing would involve mechanical, electrical, and communications inspections to ensure that all systems are working properly. Performance testing would be conducted by qualified wind power technicians and would include checks of each wind turbine and the Supervisory Control and Data Acquisition (SCADA) system prior to turbine commissioning. Electrical tests of the Project (i.e., turbines, transformers, and underground ECCS) and transmission system (i.e., gen-tie line and high-voltage substation) would be performed by qualified electricians to ensure that all electrical equipment is operational within industry and manufacturer tolerances and installed in accordance with design specifications. All installations and inspections would be in compliance with applicable codes and standards.

Construction Water: An estimated maximum water demand of approximately 173 acre-feet (AF) of water would be required over the 14 months of construction (123 AF for Campo Wind and 50 AF for Boulder Brush Facilities). Approximately 250,000 gpd would be required during peak construction demand, which would occur over the first 3 months of construction. For the remainder of Project construction, water demand would be reduced to approximately 120,000 to 150,000 gpd. This water would be used for concrete mixing, dust suppression, and other tasks. Nontoxic soil stabilizers may be used as an alternative dust-suppression method, which would considerably reduce construction water demand. These conservative water-demand estimates do not account for use of these stabilizers. Water sources during construction would include on- and off-Reservation facilities, such as production wells on the southern end of the Campo Reservation and commercially obtained non-potable water from permitted off-Reservation purveyors such as JCSD and PDMWD.

Campo Wind Facilities

During construction, water would be used for road construction, concrete mixing, dust suppression, and fire protection. A total of approximately 123 AF of water would be used during construction, a breakdown of water usage on the Reservation is as follows:

1. ***Foundation Concrete Mixing*** – It is estimated approximately 36 AF of water would be required for concrete mixing, to be prepared on-site with the batch plant.
2. ***Dust Suppression During Construction*** – It is estimated that a total of 87 AF would be used for dust suppression during construction, including access road grading and construction. Magnesium chloride, a natural element, would be applied during construction of access roads to reduce fugitive dust and the need for water during this phase.
3. ***Fire Protection*** *(Construction)* - The Project would be equipped with up to three water trucks each of 4,000-gallon capacity during construction.

Boulder Brush Facilities

Water would be required during the construction phase of the Boulder Brush Facilities and would be obtained from JCSD or PDMWD and trucked to the Project during construction.

Construction of specific components of the Project are described below.

A. Wind Turbines

Wind turbine construction would include grading the turbine and crane pads, foundation work, tower erection, nacelle, blade, and rotor installation, pad-mount installation (if necessary), miscellaneous mechanical and electrical installation, finish grading, rock ring installation around the outside of the tower, and finally restoration of the temporary disturbed ground and vegetation.

An approximately 1.9 acres temporary construction area for each wind turbine site would require clearing and grading for the crane pad, equipment laydown, and other construction-related needs. An excavator or dozer would be used for clearing and grading each turbine site. Grading would only occur where necessary and as specified by the Project's final engineering plans. Silt fencing would be placed at the limits of disturbance to control erosion consistent with the NPDES. Within this temporary construction area, a 60-foot by 100-foot crane pad is required for supporting the large tower erection crane. The crane pad would consist of a compacted native soil or compacted aggregate base gravel area. Upon completion of wind turbine construction, gravel with a minimum approximately 162-foot width would be placed around each approximately 20-foot-diameter reinforced-concrete turbine pedestal to provide truck access.

Wind turbine foundation design would be based on geotechnical and structural design parameters, wind turbine manufacturer requirements, local design codes, and standards of the wind turbine industry, as determined by the Project's certified professional engineer. It is expected that foundations would be approximately 70 to 80 feet in diameter and 7 to 10 feet below grade (exact dimensions would depend on specific site needs). Once the soil has been excavated and compacted, the framework of the foundation would be constructed of rebar and anchor bolts. After the foundation framework is built, concrete has been poured, and the foundation has cured, the area around the foundation would be backfilled and graded with stockpiled subsoil (at lower levels) and topsoil. Each concrete foundation would incorporate approximately 600 to 650 cubic yards of concrete. Each turbine foundation may also include a 5-foot by 9-foot concrete pad if the turbine uses a pad-mount transformer. A licensed geotechnical engineering firm would oversee foundation design and construction to ensure that the recommendations provided in the geotechnical investigation are followed.

Turbine towers, nacelles, and blades would be erected using cranes in three phases. Each tower would be fabricated, delivered, and erected in four to six sections. The phases would be as follows:

1. The first phase would consist of installation of the switch gear and the tower base (the bottom level of the tower sections) over the foundation anchor bolts. The tower base would be leveled, and high-strength grout would be applied in the space between the tower and the foundation.

2. The second phase would consist of installation of multiple tower sections to complete the tower.
3. The third phase would consist of installation of the nacelle, connecting it to the tower, and the full rotor assembly (including hub with three blades attached).

Turbine component deliveries would be coordinated so that components are delivered directly to wind turbine worksites where foundations have been built and backfilled, and where crane pads have been constructed. This eliminates "double handling" of the wind turbine components. Delivery trucks would pull up to each wind turbine worksite where cranes would offload the components to determined areas at the worksite where they would be prepped for later erection by a wind turbine erection team.

Construction cranes, such as a hydraulic support crane and the main crawler crane, would be used to assemble the wind turbines. The main crawler crane has a lifting capacity of approximately 400 tons and would be assembled on site. Once assembled, the main crawler crane has a track width of approximately 30 feet and is able to move slowly across relatively level terrain. Disassembly and reassembly of the main crawler crane can take up to 1 day to complete. It is anticipated that the main crawler crane(s) would move between wind turbines by following the Project access roads. In places where access roads do not link wind turbine sites, it would be necessary to perform partial or full crane re-assemblies to move the crane.

To support the construction crane during turbine erection, a compacted-soil crane pad (approximately 60 feet by 100 feet with a maximum slope of 1%) would be required at each wind turbine location. The underlying soils would be compacted to a soil-bearing capacity of 6,000 pounds per square foot to provide a stable foundation for the crane. The site would be leveled by blasting (if necessary) and grading. Where the site topography precludes such methods from achieving a 1% slope, a crane mat would be used (instead of a crane pad) to achieve the 1% slope.

The wind turbine erection crew would lift the wind turbine base section and bolt it to the foundation anchor bolts. Typically, constructors would elect to next assemble the wind turbine rotor on the ground. The hub would be positioned in a relatively flat location and a small crane would be used to lift the three blades in place so that they can be bolted to the hub. With the base set, additional sections (typically, towers are manufactured with multiple sections) would then be set and bolted in place. The final set of operations would be performed by the main crawler crane and is typically done in a relatively short period (approximately 4 hours in some cases). The main crawler crane would first lift the nacelle atop the tower and then lift the rotor so that ironworkers can bolt it to the nacelle. Upon installation of the rotor, all crane-dependent work would be completed for the wind turbine, and the main crawler crane would be relocated to complete assembly of another wind turbine. The rotor assembly of the nacelle would include a rotor hub (the 6- to 10-foot "nose cone" onto which the blades are bolted) and three turbine blades. The rotor hub would bolt to the drive train at the front of the nacelle. Rotor blades are typically made from a glass-reinforced polyester composite.

After the turbine has been erected, native soil would be used within the area surrounding the base of the turbine tower to a distance of approximately 16 feet. Suitable earthen material would be used to provide a stable surface for maintenance vehicles and to minimize surface erosion and runoff.

B. Access Roads

Campo Wind Facilities access roads would be constructed of native soils with decomposed granite and gravel, or similar suitable materials, to provide access in nearly all weather conditions. All roads would be constructed or upgraded in accordance with industry standards. Bulldozers and graders would be used to build and widen roads, and a water truck would be used for road compaction and dust control. Compaction requirements to build embankments for roads and compaction equipment would be determined by the geotechnical engineer of record for the Project.

Due to the length of the turbine blades and heavy turbine components, roadways may require upgrades and modifications to accommodate blade delivery and large delivery trucks and cranes. The Project includes the construction of new dirt access roadways and improvements to existing roadways to access the Project site. Temporary access roads between turbine sites would be constructed at up to 40-foot widths to allow for large crane movement within the site. Permanent access roads between turbines for use during Project operations would be reduced down to 24 feet wide after project commercial operations. All unpaved access roads would consist of compacted native material and may also have approximately 4 to 6 inches of aggregate and/or geosynthetic material to provide the soil strength needed for construction. The temporary disturbance areas outside the final roadway width would be graded and compacted for use during construction and then decompacted and stabilized at the conclusion of construction.

Depending on the soil subsurface, surface soils may need to be excavated and replaced with gravel and/or sand to sufficiently establish a stable road base. Roads would be located away from drainage bottoms, steep slopes, and erodible soils if practicable and would be designed to maintain current surface water runoff patterns and prevent erosion. Soil erosion would be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly. If road grade and/or runoff patterns result in added erosion, control measures would be installed to minimize the added erosion.

Exact locations of cut and fill, grading, and culvert locations would be developed and provided as part of the Project's Grading Plans.

C. Electrical Collection and Communication System

Approximately 28 miles of underground ECCS cable would be installed underground in temporary trenches in order to connect each wind turbine to the collector substation. There would be three cable conductors, one grounding wire and one fiber-optic cable installed per trench approximately 4 feet below grade. A red warning tape printed with "Buried Cable" or similar would also be placed in the trench above the cables, approximately 1 foot below grade.

The underground ECCS would be routed to minimize the overall cable length required for the Project and to lessen the temporary impacts associated with the trenching. For example, cables would be routed in parallel and/or adjacent to access roads to the extent feasible. However, in some cases, trenches would run overland from the end of one turbine string to an adjacent string. Each trench would be approximately 2 to 4 feet wide and 4 feet deep. An additional, approximately 14 feet of temporary disturbance alongside the trench would be required to account for trenching equipment and temporary placement of excavation. Depending on terrain, an approximately 40-foot-wide area may be required to install portions of the underground ECCS cables using a combination of trenching, open excavation, and directional boring. In addition, certain areas may not be feasible for trenching due to solid rock, large boulders, or subsurface resources. In these instances, a temporary worksite 15 feet to 20 feet wide may be required to enable construction of overhead ECCS circuits. These overhead circuits would be supported on steel/concrete monopoles up to 60 feet in height that would be spaced approximately 450 feet apart. Junction boxes for access to underground cables for inspection, maintenance, and repair would be installed at approximately 0.2-mile intervals. Once installed, the disturbed areas would be revegetated with a native seed mix.

Where underground ECCS cables must cross public roadways, installation can be accomplished using directional boring equipment to minimize traffic and roadbed impacts. Specific construction of each underground ECCS road crossing would be coordinated with the appropriate (BIA, Tribal, County, or state) highway departments responsible for the affected road(s). The directional boring technique involves digging a relatively small pit on one side of the road and then using a rotating bit to "drill" under the road. Cables are then pulled through the route created by the directional boring machine. Directional boring is a relatively costly installation technique for limited distances. However, directional boring is useful in situations where minimizing road and environmental impacts is important. In the event an ephemeral stream crossing is necessary, design would be coordinated with the U.S. Army Corps of Engineers to minimize impacts to sensitive areas.

D. Collector Substation

Once access to the collector substation site has been provided, site grading and preparation would follow. Approximately 3 acres would be cleared and graded to enable adequate mobility for construction equipment and activities. Site grading would require the use of bulldozers and scrapers to cut and fill native soil to the proposed pad elevation. Additional equipment, including backhoes and drill rigs, would be used to excavate foundations, and concrete mixed at the temporary concrete batch plant would be used to build the foundation/substation pad. Structural footings and underground utilities, along with electrical conduit and grounding grid, would be installed, followed by aboveground structures and equipment. Construction would continue with installation of the various concrete footers and foundations needed for the circuit breakers, control houses, and main transformer that would be installed in the collector substation area. A grounding mat, installed and then covered in gravel, would be the final ground surface of the collector substation. Steel structures, various electrical equipment, and fencing around the collector substation would then be installed. A chain-link fence would be constructed around the new collector substation for security and to restrict wildlife and unauthorized persons from entering.

E. O&M Facility

The O&M facility would be constructed during the first stage of construction after roadways and access to the Project Site are developed. The O&M facility would be located within one of the two central staging areas on the Reservation, which would be fenced for safety. The O&M building would be a single-story prefabricated structure approximately 18 feet in height. The approximately 6-acre area would include parking areas and storage. The surfacing would be compacted decomposed granite overlaid with gravel. An on-site water tank would be located within the footprint of the O&M facility in the event that other water is not available.

F. Meteorological Towers

Construction work areas would be cleared for each permanent met tower location. These work areas would vary in size due to topography, requiring an approximately 0.3- to 0.5-acre area around each permanent tower to be cleared and leveled. The construction work area would be necessary for foundation excavation and construction, assembly of met tower sections, and staging of the construction crane, which would hoist the lattice tower sections into place.

To support the construction crane for met tower erection, a compacted-soil crane pad with a maximum slope of 1% would be required. The underlying soils would be compacted to provide a soil-bearing capacity designed to provide a stable foundation for the crane.

Permanent met tower foundations would be buried underground. Although exact dimensions would depend on the geotechnical survey, site-specific needs, and the final hub height of the wind turbines, the foundations for un-guyed, self-supporting lattice structures would typically be approximately 26 feet by 26 feet. The towers would be enclosed within an approximately 50-foot by 50-foot perimeter by an 8-foot-tall chain-link fence with locked gates. All other cleared areas associated with construction would be revegetated.

Temporary met towers would be installed by crane at specified turbine locations that would have already been graded and prepared for turbine construction. Therefore, no incremental site preparation work would be required. These temporary towers would require much smaller concrete foundations than the permanent met towers, since they would be supported by guy wires. Upon collecting sufficient site-specific wind data, these towers would be removed.

G. Water Collection and Septic Systems

In the event that on-site well water is available, a water collection system would be constructed for operational purposes and would consist of incidental trenching and grading along areas to be disturbed for access or ECCS purposes. Sewage disposal is anticipated via an approved septic system nearby. In addition, sewage disposal is anticipated via an approved septic system on site or nearby on the Reservation.

H. Temporary Concrete Batch Plant for Use during Construction

After access to the temporary batch plant site on the Reservation is provided, the temporary concrete batch plant area of approximately 400 feet by 400 feet, or 3.7 acres, would be cleared and minimally graded including installation of temporary best management practices (BMPs). Areas would be assigned for the concrete mixing, for aggregate and sand stockpiling, ingress and egress, truck load-out area, and turnaround(s). Sand, aggregate, concrete, and water would be delivered to the temporary concrete batch plant and stored in stockpiles until use. The temporary batch plant area would be removed upon completion of construction and revegetated in accordance with the applicable requirements.

I. Temporary Staging and Parking Areas for Use during Construction

Two, central, On-Reservation, temporary staging areas of approximately 20 acres total would be cleared and graded including installation of temporary BMPs. The staging areas would provide for construction-management facilities, materials and equipment storage, and worker parking. Vehicle parking would be clearly marked and limited to areas away from sensitive habitat. The staging areas would require a temporary tap to an existing electrical distribution line to provide power throughout construction. This would require a temporary construction right-of-way of approximately 1,000 feet by 12 feet (0.28 acres). The temporary distribution line tap would require the installation of up to 10 wooden distribution poles within this temporary right-of-way, which would take approximately 1 month to install. Generators would be placed at the temporary central and turbine staging areas and would be used until the temporary tap is complete.

Temporary security fencing (6-foot-tall chain-link fencing) may be placed around all or parts of the central staging areas to limit public and wildlife access. When construction is complete, the fencing would be removed. The O&M facility would be constructed at one of the staging areas; the land outside the O&M facility footprint would be revegetated. The other temporary staging area would be removed upon completion of construction and revegetated in accordance with the applicable requirements.

J. On-Reservation Gen-Tie Line

Work on the approximately 5 miles of gen-tie transmission line on the Reservation would begin with construction of new or improved access roads to the gen-tie line steel pole structures. The gen-tie line access roads would be graded level and would generally be 16 feet wide for straight sections and up to 20 feet wide at curves to allow for the safe access of construction equipment and vehicles. Access roads to the gen-tie line structures would be decomposed granite and gravel roads.

Engineered steel poles would be drilled on pier foundations for turning or dead-end structures and directly embedded structures for tangential poles. Each turning or dead-end steel pole would be set on a concrete foundation pier, with a hole dimension of approximately 24 inches in diameter and up to 25 feet deep. Each tangential structure would be directly augered into up to 24-inch holes, backfilled with native soils, and then compacted. Pole holes would be excavated using a truck-mounted drill rig; poles would then be delivered on a flatbed trailer and hoisted into place by a crane. Poles associated with the I-8 crossing would involve foundations with pole hole of 36 inches in diameter by up to 36 feet deep.

Installation of the new 230 kV conductor would require pull sites along the gen-tie line route. Generally, pull sites would be approximately 100 feet by 150 feet and would be required where 230 kV angle structures are located. The sites would be needed to load the tractors and trailers with reels of conductors and the trucks with tensioning equipment. After the conductor has been pulled into place, the sag between the structures would be adjusted to a pre-calculated level and the line would be installed. The conductor would then be attached to the end of each insulator, the sheaves would be removed, and the vibration dampers and other accessories would be installed. Approximately 5 miles of the 230 kV gen-tie line, including 42 support poles, would be located on the Reservation.

K. Boulder Brush Facilities

1. Off-Reservation Gen-Tie Line

Work on the approximately 3.5 miles of gen-tie line within the Boulder Brush Corridor on private land would begin with construction of a new access road to the new switchyard and new access roads to the gen-tie line steel pole structures. The gen-tie line access roads would be graded and would generally be 16 feet wide for straight sections and up to 20 feet wide at curves to allow for the safe access of construction equipment and vehicles. Access roads to the gen-tie line structures would be decomposed granite and gravel roads, but the main access road to the switchyard would ultimately be finished as a 30-foot-wide paved road.

Engineered steel poles would be drilled on pier foundations for turning or dead-end structures and directly embedded structures for tangential poles. Each transmission line pole would be set on a concrete foundation, with the hole dimensions approximately 8 feet wide by 25 feet deep. Pole holes would be excavated using a truck-mounted drill rig and poles would then be delivered on a flatbed trailer and hoisted into place by a crane. Where required for pier foundations, steel cages and anchor bolt cages would be set in the open hole for reinforcement. Directly embedded structures would be backfilled with native excavated material or a light concrete mixture, depending on specific conditions for each pole site. Any remaining excavated material would be placed around the holes or spread onto access roads and adjacent areas.

Installation of the new 230 kV conductor would require pull sites along the gen-tie line route. Generally, pull sites would be approximately 100 feet by 150 feet and would be required where 230 kV angle structures are located. The sites would be needed to load the tractors and trailers with reels of conductors and the trucks with tensioning equipment.

After the conductor has been pulled into place, the sag between the structures would be adjusted to a pre-calculated level and the line would be installed. The conductor would then be attached to the end of each insulator, the sheaves would be removed, and the vibration dampers and other accessories would be installed.

2. High-Voltage Substation

Once access to the high-voltage substation site has been provided, site grading and preparation would follow. The site would be cleared, graded, and prepared to enable adequate access for construction equipment and activities. Site grading would require the use of bulldozers and scrapers to cut and fill native soil to the proposed pad elevation. Additional equipment, including backhoes and drill rigs, would be used to excavate foundations, and concrete mixed at the temporary concrete batch plant would be used to build the foundation/substation pad. Construction would continue with installation of the various concrete footers and foundations needed for the circuit breakers, control houses, and main transformer that would be installed in the high-voltage substation area. A grounding mat, installed and then covered in gravel, would be the final ground surface of the high-voltage substation. Steel structures, various electrical equipment, and fencing around the high-voltage substation would then be installed. The facility would be fenced with up to 8-foot-tall security fencing consisting of a 6-foot-high chain-link structure with an additional 2 feet of security wire at the top.

3. 500 kV Switchyard and Connection to Existing SDG&E Sunrise Powerlink

Construction of the switchyard would begin with clearing vegetation and organic material from the switchyard site. The switchyard site would then be excavated to frame and pour foundations. Structural footings and underground utilities, along with electrical conduit and grounding gird, would be installed, followed by aboveground structures and equipment. An 8-foot-tall fence consisting of a 6-foot-high chain-link structure with an additional 2 feet of security wire would be constructed around the switchyard for security and to restrict wildlife and unauthorized persons from entering the facility.

Construction of the incoming and outgoing connection lines would be performed by SDG&E and would involve installing approximately 12 steel transmission structures, stringing high-voltage transmission wires, and tension pulling the wires.

4. Access Roads

The paved road on private lands from the existing paved Ribbonwood Road to the switchyard would be constructed to approximately 30 feet in width. The access roads to gen-tie poles within the Boulder Brush Corridor on private land would be constructed to between 16 feet and 20 feet wide. Improvements to existing roads would consists of increased graded width in areas, particularly corners or bends, and improved crossings involving addition of blocks for stability or increased length of culverts as necessary. The portions of increased road width necessary for construction activities but not required for operations would be removed upon completion of construction and revegetated in accordance with the applicable requirements.

All unpaved access roads would consist of compacted native material and may also have approximately 4 to 6 inches of aggregate and/or geosynthetic material to provide the soil strength needed for construction. The temporary disturbance areas outside the final roadway width would be graded and compacted for use during construction and then decompacted and stabilized at the conclusion of construction. The paved access road within the Boulder Brush Boundary up to the high-voltage substation and switchyard would include a 20-foot-wide fuel modification zone maintained on either side of the access roads (30-foot road plus 20-foot fuel modification zones on both sides of the road equals a 70-foot-wide area for the road and fuel modification zones combined).

Depending on the soil subsurface, surface soils may need to be excavated and replaced with gravel and/or sand to sufficiently establish a stable road base. Roads would be located away from drainage bottoms, steep slopes, and erodible soils if practicable and would be designed to maintain current surface water runoff patterns and prevent erosion. Soil erosion would be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly. If road grade and/or runoff patterns result in added erosion, control measures would be installed to minimize the added erosion.

5. Defensible Space (Fuel Modification Zones)

Fire protection measures for private lands are defined in County Code Regulatory Ordinance, Title 9, Division 6, Chapter 1, County Fire Code. The regulations identify access road requirements and fuel modification zone requirements.

County Code, Section 96.1.503.1.1, specifies that "approved fire apparatus access roads shall be provided for every facility, building, or portion of building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend within 150 feet of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility." Exceptions are as follows:

> **Exceptions:** The fire code official may increase the 150-foot minimum where:
>
> 1. Fire apparatus access roads cannot be installed because of topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
> 2. There are no more than two Group R-3 or Group U occupancies.

County Code, Section 96.1.202, defines a fuel modification zone as a strip of land where combustible vegetation has been thinned or modified or both and partially or totally replaced with fire-resistant and/or irrigated plants to provide an acceptable level of risk from vegetation fires. Fuel modification reduces the radiant and convective heat on a structure and provides valuable defensible space for firefighters to make an effective stand against an approaching fire front.

Permanent access roads would be constructed to provide access to the high-voltage substation and switchyard on private land. County Code, Section 96.1.4907.2.1, specifies fuel modification of combustible vegetation from sides of roadways. Details regarding the extent of defensible space and fuel modification zones will be determined prior to final design with the input of relevant fire authorities. The Fire Authority having jurisdiction may require a property owner to modify combustible vegetation in the area within 20 feet from each side of the driveway or a public or private road adjacent to the property to establish a fuel modification zone. The nearest fire station to Boulder Brush Facilities, located in Boulevard just south of I-8 off of Ribbonwood Road, is operated by the CAL FIRE.

Water would be used for road construction, concrete mixing, dust suppression, and fire protection. A total of approximately 50 acre-feet (AF) of water would be used during construction, a breakdown of water usage for the Boulder Brush Facilities as follows:

1. ***Foundation Concrete Mixing*** – It is estimated approximately 15 AF of water would be required for concrete mixing, to be prepared at the temporary batch plant to be located on the Reservation.
2. ***Dust Suppression During Construction*** – It is estimated that a total of 35 AF would be used for dust suppression during construction, including access road grading and construction. Magnesium chloride, a natural element, would be applied during construction of access roads to reduce fugitive dust and the need for water during this phase.
3. ***Fire Protection (Construction)*** – The Project would be equipped with up to three water trucks each of 4,000-gallon capacity during construction and a 30,000 gallon water tank.

1.3 Operation

O&M Management Planning

Except for the switchyard and the incoming and outgoing connection lines (which would be owned, operated, and maintained by SDG&E), the Project would be operated by the developer or a qualified third-party designee. The developer would operate these facilities in accordance with an operating plan, which would be tailored to meet the requirements of all Project agreements, permitting requirements, and prudent industry practices. The overall operational approach is summarized below. An O&M manager would be responsible for ensuring that all plant personnel are familiar with operating procedures and that they comply with all permit conditions and the annual maintenance plan in their daily activities. The annual maintenance plan would be developed in accordance with turbine manufacturer recommendations, developer-established maintenance procedures, industry practices, and equipment conditions. The maintenance plan would be entered into the plant maintenance management system for scheduling, material procurement, implementation, and tracking of the work. O&M personnel would manage the major maintenance under the direction of the O&M manager. Non-routine repair situations would, by definition, require unplanned maintenance activities. These activities would be evaluated by the O&M manager and incorporated into the plant maintenance management system.

Capital improvements would be managed similarly to the major maintenance plan. The O&M manager, working with O&M personnel, would be responsible to look for opportunities to provide continuous improvement in terms of enhancing plant performance and reducing costs. As opportunities for such improvements are identified, the plant personnel would initiate a design concept for the improvement, perform a budgetary analysis showing cost vs. benefit, and present a recommendation to the operator. If the operator concurs with the recommendation, the O&M manager would seek appropriate engineering and, if necessary, procure the materials, equipment, or services necessary to implement the capital improvement.

Operation and Management Tasks

The developer would operate and maintain the Project except for the 500 kV switchyard and the incoming and outgoing transmission line connecting the 500 kV switchyard to the Sunrise Powerlink. Those facilities would be owned, operated, and maintained by SDG&E. All turbines, ECCS cables, substations, and transmission lines would be operated in a safe manner according to standard industry procedures. Routine maintenance of the turbines would be necessary to maximize performance and detect potential inefficiencies. The developer and the turbine supplier would control, monitor, operate, and maintain the Project by means of a SCADA system and regularly scheduled on-site inspections. Any problems would be promptly reported to on-site O&M personnel, who would perform routine maintenance and most major repairs. Most servicing would be performed up-tower (i.e., O&M personnel climb the towers and perform maintenance within the tower or nacelle and access the towers using pick-up trucks), without using a crane to remove the turbine from the tower. In certain instances, major maintenance (for example blade repair) would require use of a crane. Additionally, all roads, turbine bases, and trenched areas would be regularly inspected and maintained to minimize erosion. The developer anticipates that approximately 10–12 O&M staff would be employed at a time throughout the life of Project. Hours of operation will be from 7:00 a.m. to 4:00 p.m. with at least one on-call emergency staff member at all times. Major holidays will lessen staff to only three full-time personnel.

All scheduled maintenance activities would occur within areas previously disturbed by construction, so no new ground disturbance would occur during O&M of the Project. Turbine maintenance is typically performed up-tower, so no heavy equipment would be needed. It is anticipated that at least once in a wind turbine’s lifespan, a large crane would be needed for major maintenance. In this event, vegetation would be cleared within the area previously disturbed during construction to provide for safe and efficient operation of the crane. Ground-disturbing activities may include occasional need to access underground cables or communications lines.

Access roads would be maintained during O&M to prevent off-road detours due to ruts, mud holes, or other deterrents. Roads would be maintained as needed; it is anticipated that maintenance would occur twice per year, but more frequent maintenance would be performed if needed. All fuels and hazardous materials would be properly stored during transportation and while at the job site. Workers would be instructed to keep all job sites in a sanitary and safe condition. Workers would be expected to respect the property rights of private landowners. Workers would be briefed on standard safety protocols when handling and storing hazardous materials. For vegetation control purposes, mowing or weed-eating would occur along Project roads, and around the substations, O&M facility, and turbines. The transmission line route and other Project facilities would be inspected for trees that may pose safety threats or potential damage hazards to Project facilities. Hazardous trees (trees that have been identified as dead, dying, or with high potential to fall and cause damages) would be trimmed or cut and removed as needed.

All collector substation monitoring and control functions would be performed remotely. Warning signs would be posted and entry to the new collector substation would be restricted to authorized personnel. For gen-tie line and collector substation inspection, collector substation inspections would occur weekly and would consist of visual inspection of batteries, charger, backup generator breaker, etc. A line patrol would be conducted monthly on (each) line, with binoculars for the first year. After the first year of the line and substation install, all fasteners and inspect all equipment would be re-torqued. After the first year, re-torque would be conducted every 5 years.

Similar to the collector substation, monitoring and control for the switchyard and transmission lines for the Boulder Brush Facilities would be performed remotely. Routine maintenance of the switchyard would involve personnel in a pickup truck visiting weekly. Maintenance vehicles would be used throughout the year for maintenance of the switchyard by SDG&E personnel, consistent with maintenance of other SDG&E facilities in the vicinity. Appropriate lighting would be installed inside the high-voltage substation and 500 kV switchyard fenced areas for emergency repair work. Since nighttime maintenance activities are not expected to occur more than once per year, safety lighting inside the high-voltage substation and switchyard fence would normally be turned off. Some of the perimeter lighting in both facilities would remain on throughout the night for safety purposes.

Fire Management

Each Campo turbine would have a 50-foot-radius fuel modification zone that would include the 10-foot radius for the turbine tower, from which a 16-foot zone of suitable earthen material would encircle the base of the turbine tower. Beyond that, a vegetation management area would extend for an additional 24 feet. The Collector substation and the O&M facility would have a 100-foot-wide fuel modification zone around the facilities, including gravel parking areas and a vegetation management area. The vegetation management area would consist of annually mowed vegetation to limit vegetation height and fire fuel potential. Along either side of new roads, a 6-foot-wide vegetation management area would be maintained.

For purposes of fire management, a fuel modification zone of 100 feet (50 feet each side, including a 16-foot-wide road on one side) would extend along the overhead line (230 kV). The transmission line route and other Project facilities would be inspected for trees that may pose safety threats or potential damage hazards to Project facilities. Hazardous trees (trees that have been identified as dead, dying, or with high potential to fall and cause damage) would be trimmed or cut and removed as needed.

1.4 Decommissioning

The Project is anticipated to operate for the term of the lease and any renewal extension. If the Campo Wind Facilities were to be decommissioned, a decommissioning plan would be prepared and implemented consistent with the requirements of the Campo Lease. The decommissioning plan would be implemented after the Campo Lease term. Decommissioning refers to the dismantling of Campo Wind Facilities elements and restoration of the Campo Corridor upon expiration of the Campo Lease and the operating life of the Campo Wind Facilities.

The aboveground dismantling of the turbines and permanent Met towers would take approximately 26 weeks and would include cranes, flatbed trucks, rough terrain forklifts, 12 workers, 4 vendor trucks, and approximately 390 haul trips. Pad removal would take approximately 12 weeks with 24 workers, 4 vendor trucks, and 1,125 haul trips. Demolition and removal of the O&M building would take approximately 8 weeks and would involve 12 workers and 4 vendor trucks.

The following sequence for removal of components would be implemented at decommissioning:

1. Turbines, Met towers, transmission line, and Collector substation would be dismantled and removed.
2. Pad-mounted transformers, if any, would be removed.
3. All turbine, Met tower and Collector substation foundations would be removed to a depth of 3 feet.
4. The Campo Corridor would be restored to the condition required by the Campo Lease.

Turbines would be refurbished and sold or recycled as scrap material. All material that could not be salvaged would be appropriately disposed of at an authorized site in accordance with applicable laws and regulations. Reclamation of the Campo Corridor following decommissioning would be based on the terms of the Campo Lease and may include regrading, replacement of topsoil, and revegetation.

Decommissioning of the Campo Wind Facilities would minimize new site disturbance and removal of native vegetation to the extent practicable. To the extent practicable, topsoil removed during decommissioning would be stockpiled and used as topsoil during restoration efforts. Soil would be stabilized and revegetated with plant species characteristic of native species within adjacent habitats. Local seed sources would be used where feasible.

Decommissioning of the Boulder Brush Facilities, with the exception of the facilities owned and operated by the SDG&E, would follow all state and County requirements for decommissioning.

Decommissioning of these facilities would minimize new site disturbance and removal of native vegetation to the extent practicable. To the extent practicable, topsoil removed during decommissioning would be stockpiled and used as topsoil during restoration efforts. Soil would be stabilized and revegetated with plant species characteristic of native species within adjacent habitats. Local seed sources would be used where feasible. All decommissioning activities would take place in accordance with all applicable laws, regulations, and terms of the lease.

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