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CHAPTER 2
Description of Project and Alternatives

2.1 Project Overview

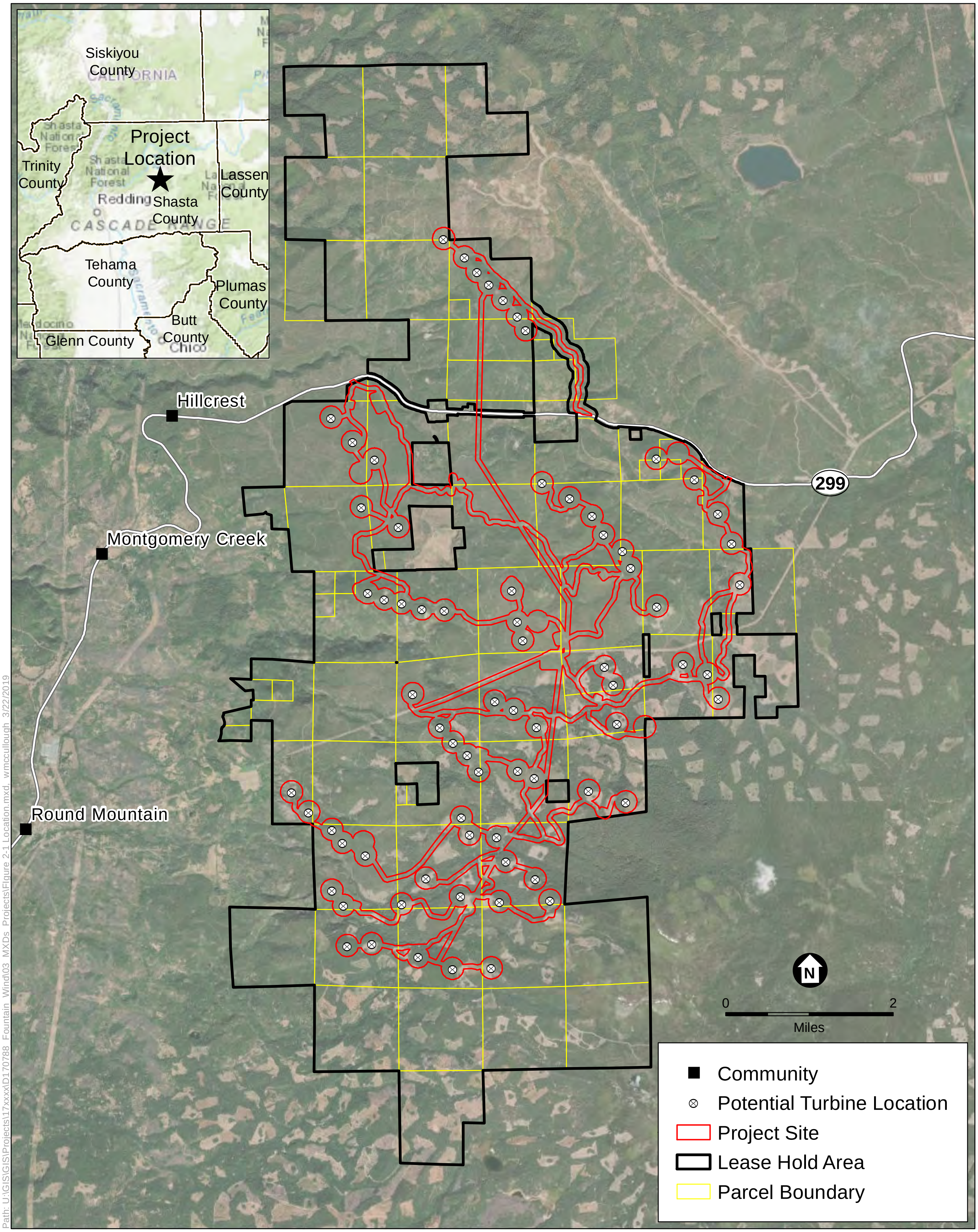
The Fountain Wind Project (Project) is a wind energy generation development proposed by Fountain Wind LLC (Applicant), in an unincorporated area of Shasta County. The Applicant has applied for a Use Permit (UP 16-007) to construct, operate, maintain, and decommission wind turbines and related infrastructure within an approximately 29,500-acre leased area encompassing 74 Shasta County (County) Assessor's Parcels. Within the leasehold area, the Project would be developed within an 4,464-acre area (Project Site) where the permanent project facilities would be sited. The Project Site includes all area where either temporary or permanent disturbance may occur. See **Figure 2-1**, *Project Location*.

The County, as the Lead Agency under the California Environmental Quality Act (CEQA),[1] is preparing this Environmental Impact Report (EIR) to document its analysis of the potential impacts of the Project described in Section 2.4, *Description of the Project*, and the alternatives described in Section 2.5, *Description of Alternatives*.

The Project described in Section 2.4 reflects refinements made since the July 2017 Use Permit application filing date based on the Applicant's further environmental and engineering review. Briefly, the Applicant proposes fewer, taller wind turbines than initially proposed: a decrease from 100 to up to 72 turbines and an increase in maximum height from 591 feet to 679 feet tall, as measured from ground level to vertical blade tip (total tip height), with hub heights of up to approximately 410 feet (125 meters) and rotor diameters of up to approximately 531.5 feet (162 meters). With fewer turbines, the Project analyzed in this EIR also includes reduced access roads, collection systems, and related infrastructure relative to the initial proposal. Each turbine would have a generating capacity of 3 to 5.7 megawatts (MW). Overall, the Project would have a total nameplate generating capacity of up to 216 MW.[2] Associated infrastructure and facilities would include: a 34.5-kilovolt (kV) overhead and underground electrical collector system to connect turbines together and to an onsite collector substation; overhead and underground fiber-optic communication lines; an onsite switching station to connect the Project to the regional grid operated by the Pacific Gas and Electric Company (PG&E); a temporary construction and

[1] This analysis is being prepared pursuant to CEQA (Pub. Res. Code §21000 et seq.) and its implementing regulations, the CEQA Guidelines (14 Cal. Code Regs. §15000 et seq.).

[2] "Nameplate capacity" is the amount of power that would be generated under ideal conditions. Actual output can differ from nameplate capacity for a number of reasons, including wind speeds and other weather conditions, and equipment maintenance.



Fountain Wind Project

Figure 2-1
Project Location

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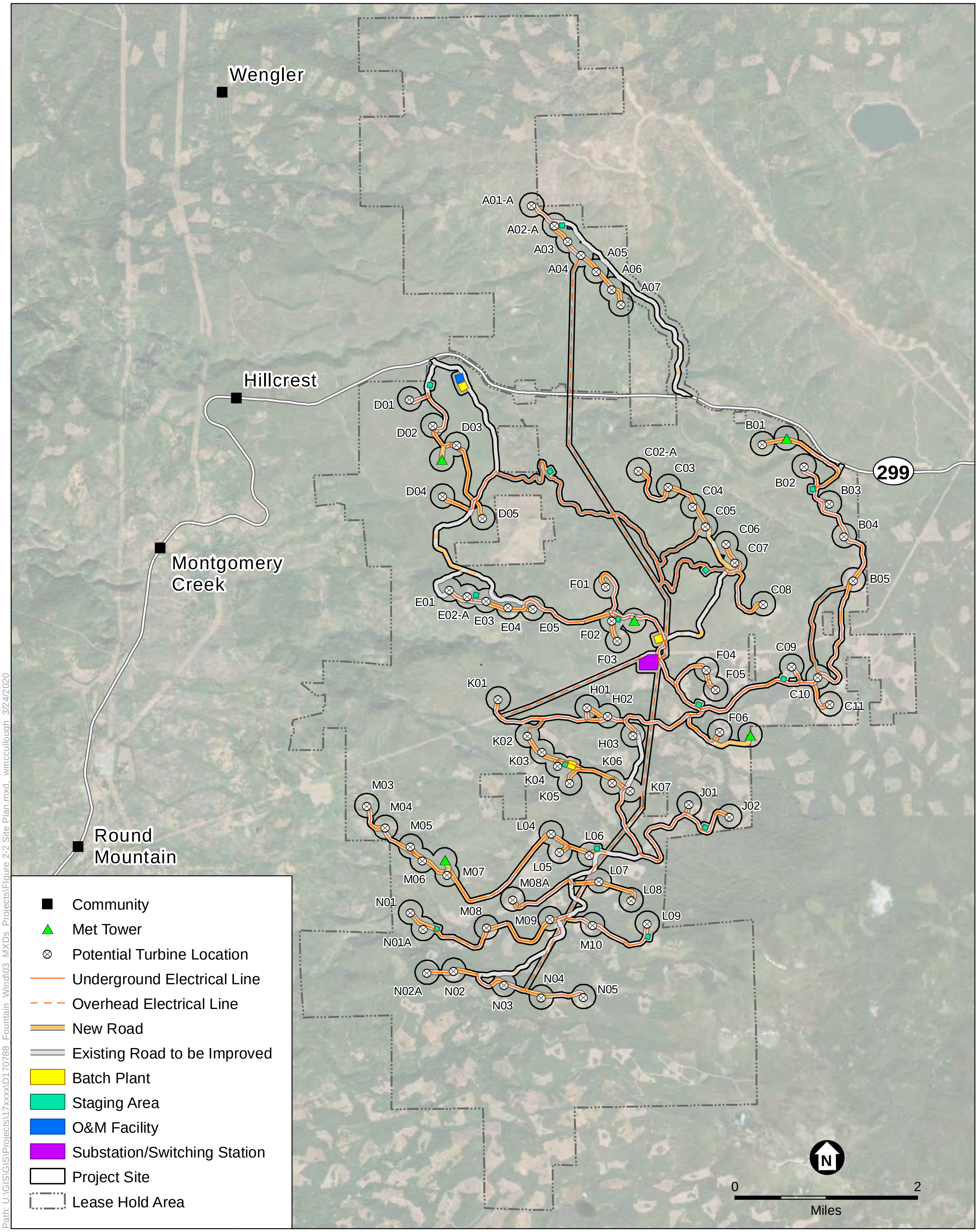
equipment laydown area; 14 temporary laydown areas distributed throughout the Project Site to store and stage building materials and equipment, an operation and maintenance (O&M) facility with employee parking; up to four permanent meteorological evaluation towers (METs); temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET locations); two storage sheds; and three temporary batch plants. New access roads would be constructed within the Project Site, and existing roads would be improved. See **Figure 2-2**, *Project Site Plan*, which shows the proposed layout of Project components. The Project would operate year-round.

2.2 Project Location

The Project Site is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately north and south of State Route (SR) 299, and near the private recreational facility of Moose Camp.[3] Other communities near the Project Site include Montgomery Creek, Round Mountain, Wengler and Big Bend. The project site is also within in a geographic area that is traditionally and culturally affiliated with the Pit River Tribe. Access to the Project Site is provided locally by SR 299, Moose Camp Road, and three existing, gated logging roads, and would be provided regionally by highways that provide access to SR 299, including Interstate 5 (I-5), which is approximately 35 miles to the west of the Project Site, and SR 139, which is approximately 60 miles to the east of the Project Site.

The Project Site is located within the southern end of the Cascade Range with topography characterized by buttes and peaks separated by small valleys. The Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned; many are used for timber harvesting purposes. Elevations within the Project Site range from 3,000 to 6,000 feet above sea level. Little Cow Creek and the south fork of Montgomery Creek cross the Project Site from east to west. Other small tributaries run through the valleys. Northern portions of the leasehold were affected by the 1992 Fountain Fire, as evidenced by burn scars. The Shasta County General Plan designates the Project Site as Timber (T); the zoning designations are Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). See **Figure 2-3**, *General Plan Land Use and Zoning Designations*. The existing land use within the Project Site consists exclusively of managed forest lands. Logging roads (some of which are unpaved) and transmission lines cross the Project Site.

3 Moose Camp is an approximately 146-acre private recreational facility owned and operated by Moose Recreational Camp, Ltd., a California Non-Profit Mutual Benefit Corporation, for the benefit of its approximately 75 members and their families (Moose Recreational Camp, Ltd., 2012a, 2012b; Appendix J, *Scoping Report* [Letters P17, P23, P37, P43, P55]). In Moose Camp, 50 cabin residences are used year-round (Appendix J, *Scoping Report* [Letters P17, P23, P37, P43, P55]).



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Fountain Wind Project

Figure 2-2
Site Plan

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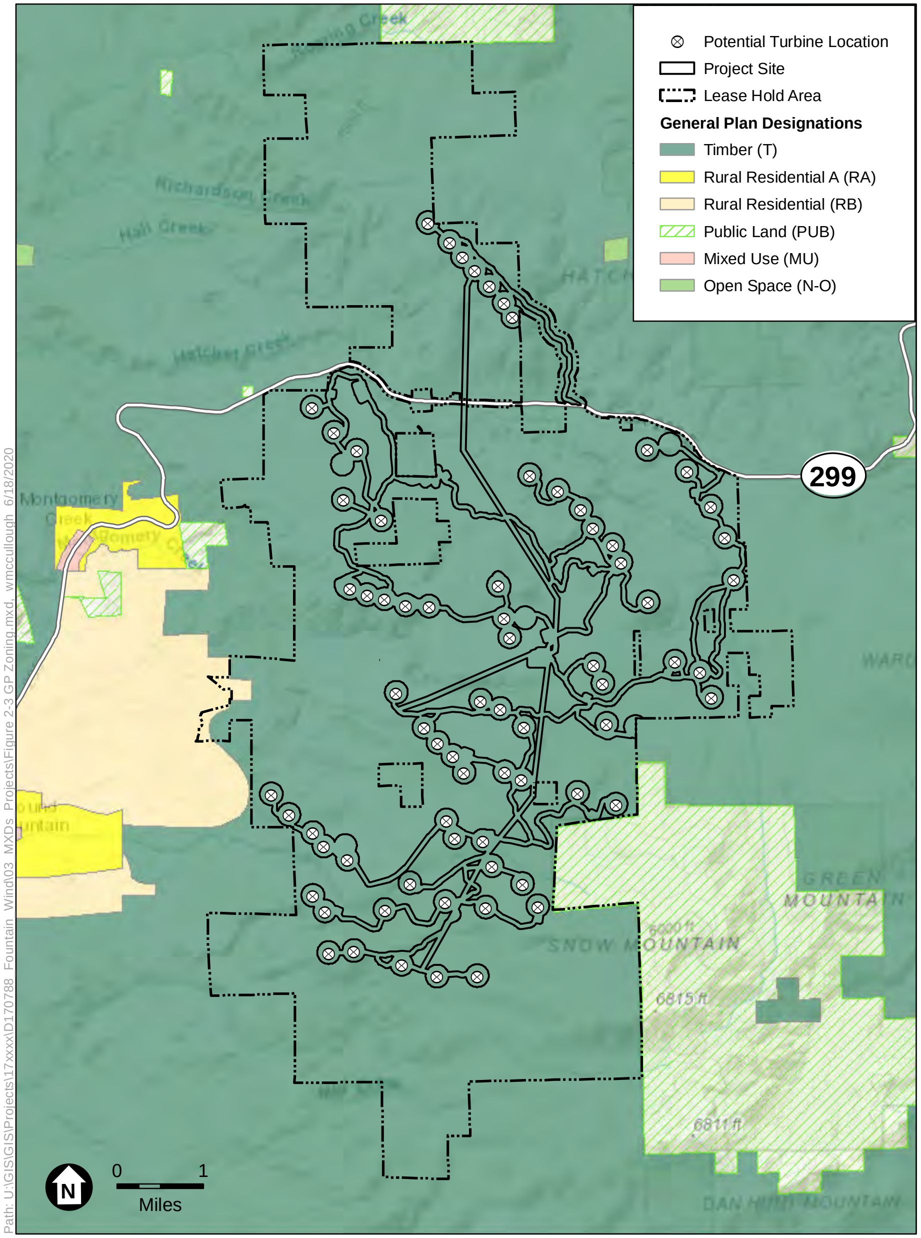
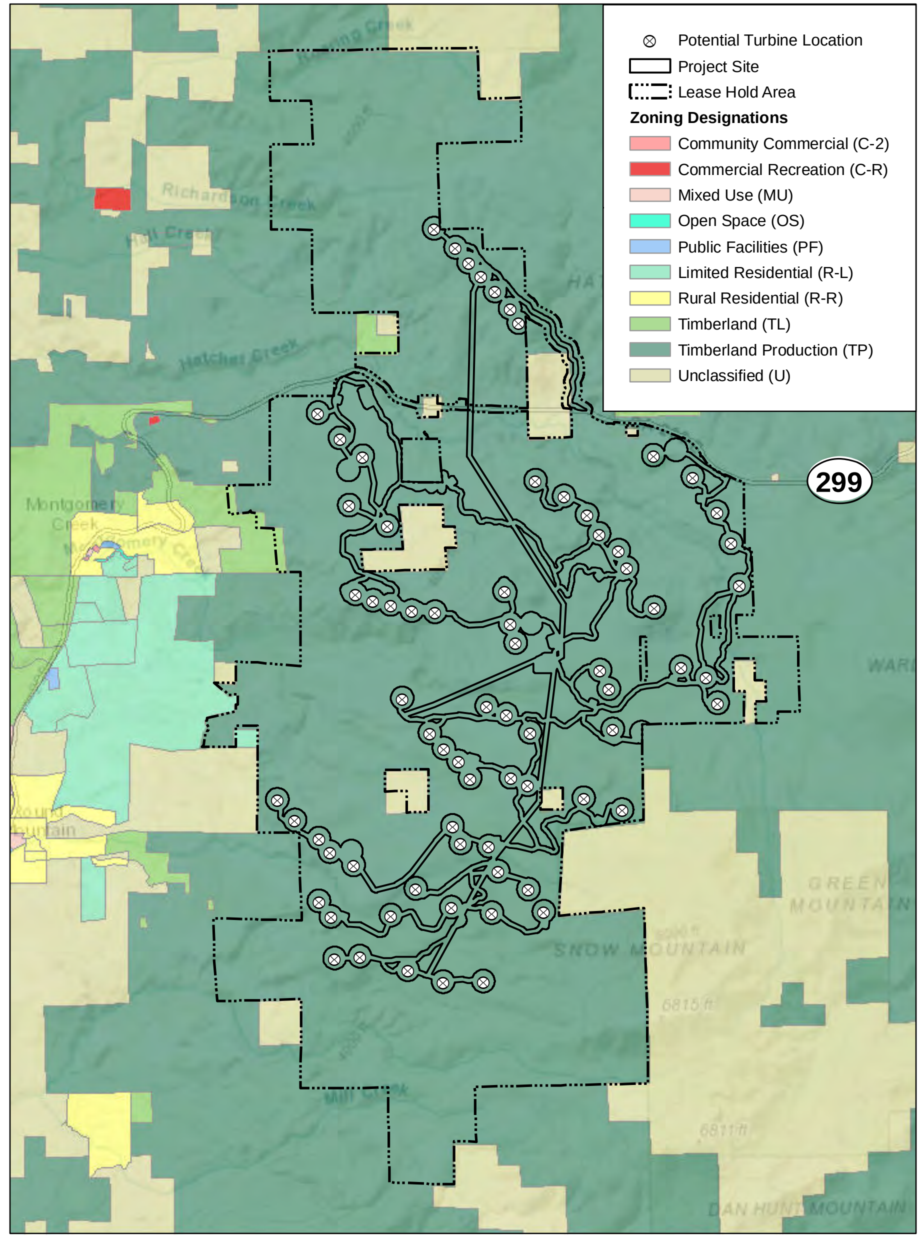


General Plan Land Use Designations



Zoning Designations

Fountain Wind Project

Figure 2-3

General Plan Land Use and Zoning Designations

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SOURCE: Shasta County, 2019

2.3 Project Objectives

The Applicant seeks to build the Fountain Wind Project to meet the following objectives:

1. Develop, construct, and operate a commercial wind energy generation facility capable of generating up to 216 MW of wind energy.
2. Interconnect to the Northern California electrical grid (NP15).[4]
3. Locate the Project in close proximity to an existing transmission line with sufficient capacity to reduce impacts and costs associated with building new transmission infrastructure.
4. Assist California in meeting the renewable energy generation targets set in Senate Bill (SB) 100.[5]
5. Create temporary and permanent jobs in Shasta County and contribute to the County's tax base.
6. Obtain entitlements to construct and operate a commercially financeable wind energy project.
7. Support landowners through diversification of revenue streams.
8. Offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels.
9. Provide emissions-free energy for approximately 100,000 households.[6]

2.4 Description of the Project

The Project consists of three major components: (1) Up to 72 turbines, including associated concrete foundations, pads, and temporary construction areas; (2) 34.5 kV overhead and underground collector lines and fiber optic communication cabling; and (3) an onsite substation and switching station for connecting the Project into the existing PG&E transmission line (Figure 2-2). All of these improvements would be entirely within the Project Site. The elements of each of these major components are described in more detail below. Ancillary facilities and infrastructure also would be required, including access roads, temporary construction laydown areas, an O&M facility, up to four permanent METs (five potential locations are being analyzed), storage sheds, and up to three temporary concrete batch plants. Project components and disturbance areas, including for the removal of vegetation/timber and timber conversion, are summarized in **Table 2-1**, *Project Components and Disturbance Areas*.

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4 The California Independent System Operator (CAISO) manages the operation of California's power grid, including the generation and transmission of electricity by PG&E and the CAISO's other member utilities. The CAISO divides the state into three regions: NP15, SP15, and ZP26. NP15 corresponds to PG&E's electric service territory (CAISO, 2008; PG&E, 2014). An existing 230 kV line crosses the Project Site south of SR 299 (CEC, 2014). The Project would interconnect to the grid along this line.

5 SB 100 was signed into law on September 10, 2018. This bill accelerates the state's renewable energy goals, requiring 60 percent of California's electricity portfolio to come from eligible renewable sources by 2030 and that all retail electricity be carbon-free by 2045.

6 The California Public Utilities Commission (CPUC) reported in 2018 that "California households consume electric service at an average rate of 534 kWh per month in the summer months, and 459 kWh per month in the winter months" (CPUC, 2018a). If California households consume an average of 496.5 kWh per month (or 5.958 MWh per year), then the Project's generation of 605,491 MWh of electricity per year could serve an estimated 101,627 households per year.

TABLE 2-1
PROJECT COMPONENTS AND DISTURBANCE AREAS

Project Component	Quantity	Total Temporary Construction Disturbance Area	Permanent Disturbance Area
Turbines and pads (including temporary turbine construction areas)	Up to 72	5 acres per turbine (up to 360 total acres)	2.5 acres per turbine (up to 180 total acres)[a]
Underground electrical collector system[b]	Up to 51 miles	50-foot-wide corridor, up to a total of 309 acres	30-foot-wide corridor cleared of large vegetation, up to a total of 185 acres
Overhead electrical collector line and associated roads, work footprint, and permanent 2-track access road[c]	Up to 12 miles	100-foot-wide corridor, up to a total of 145 acres	80-foot-wide right of way cleared of large vegetation, up to a total of 116 acres
Onsite collector substation	1	8 acres	5 acres
Onsite switching station (including interconnection equipment)	1	11 acres	8 acres
Access roads (including crane roads)	Up to 24 miles of new roads	80-foot-wide disturbance area, up to a total of 233 acres. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	20-foot-wide drivable surface with a 1-foot shoulder on both sides and up to an additional 10 feet on either side where required for storm water drainage design, up to a total of 122 acres. Permanent disturbance width nominally up to 200 feet in some locations.
Widen existing 16-foot-wide access roads	Up to 33 miles of existing roads may be widened	80-foot-wide disturbance area (16 feet of which are already disturbed), up to 256 acres of new disturbance. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	Permanently widen to 20 feet with a 1-foot shoulder on both sides and up to 10 feet on either side where required for storm water drainage design, up to 96 acres. Permanent disturbance width nominally up to 200 feet in some locations.
O&M facility	1	5 acres	5 acres (including a 5,460-square foot O&M building and two 0.5-acre Operations storage sheds)
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0 acres
Temporary laydown areas	14	2 acres per laydown area (28 acres total)	0 acres
Temporary concrete batch plant, if necessary	3	3 to 5 acres per batch plant (up to 15 acres total)	0 acres
MET Towers	4	1 acre per structure (4 acres total)	0.5 acre per structure (2 acres total)
Anticipated Total Temporary Construction Disturbance[d]: 1,384 acres			
Anticipated Total Permanent Disturbance: 713 acres			

NOTES:

[a] The area of permanent disturbance for each turbine includes an approximately 0.5-acre area to accommodate the footprint of the turbine, related components, and gravel access pad. An additional area, up to approximately 2.0 acres, would be maintained clear of taller vertical vegetation during operations and maintenance and would serve as defensible fire space around each turbine.

[b] Portions of the underground collector system would be located within the access road construction buffer to minimize impacts. No additional permanent impacts would occur in these areas. This acreage includes the co-located underground communications system.

[c] Acreage includes co-located overhead communications system. An 80-foot-wide corridor centered on the overhead electrical collector line is assumed for disturbance calculations.

[d] Timber harvested and timberland to be coverted is included within the anticipated disturbance areas.

SOURCE: Stantec, 2018 (in Draft EIR Appendix J)

2.4.1 Wind Turbine Generators

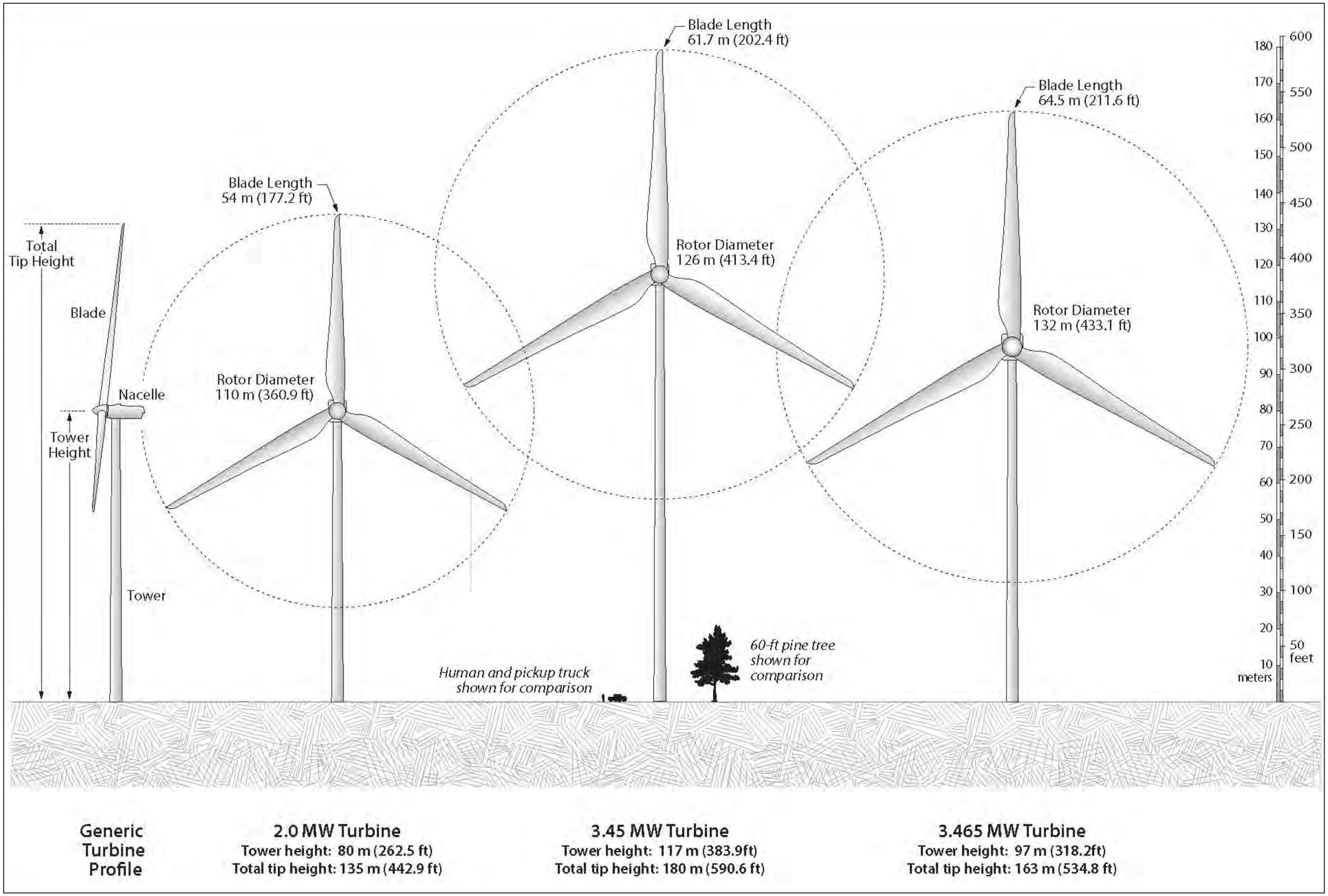
The site plan shown in Figure 2-2 depicts 72 turbine sites that are being considered as part of the Project. Final design may include fewer than 72 turbine sites. The 72 turbine sites represent feasible locations for a range of turbine models, each with different dimensions, generating capacity, and layout requirements. Prior to construction, the Applicant would determine which model would be installed based on component availability from the manufacturer, data on onsite wind resources, and other Project-specific factors. Regardless of the model ultimately selected, the Project would not exceed the proposed maximum 216 MW nameplate generating capacity.

The Project would construct, operate, maintain, and decommission up to 72 wind turbines, each with a nameplate generating capacity of 3.0 to 5.7 MW, to convert wind energy directly to electrical power to supply the existing electrical grid. The Project would use three-bladed, horizontal-axis turbines, meaning the rotor shaft and nacelle, which contains the electrical generator, would be mounted at the top of a cylindrical tower. A range of turbine heights are being considered; however, the maximum possible height would be 679 feet from ground level to the vertical turbine blade tip. Each turbine tower would be mounted on a concrete pedestal supported by a permanent foundation. Generic (non-Project-specific) turbine profiles are shown in **Figure 2.4a**, *Typical Wind Turbine*.

Designated turbines and METs would have flashing red lights installed to improve nighttime visibility for aviation and comply with Federal Aviation Administration (FAA) standards and Advisory Circular 70/7460-1L (FAA, 2016). In accordance with these standards, the Applicant would prepare a lighting plan for the Project and obtain FAA approval that would specify the installation of flashing red lights on designated turbines and METs to improve nighttime visibility for aviation. Because the height of the proposed turbines would be greater than 500 feet, it is expected that each would need to be lit with two lights. The Applicant would submit the FAA-approved plan to the County before turbine installation begins.

A commercial-scale wind turbine is made up of three main parts, including a tower, nacelle, and three blades that make up the rotor. The rotor is attached to the nacelle, which houses the generating components within a wind turbine, including the drive shaft, gearbox, generator, and controls. The tower provides the vertical support for the nacelle and rotor. Each turbine tower would be mounted on a concrete pedestal supported by a foundation. Spread footing foundations, which have a wide base that spreads the weight of the structure over a larger subsurface area for greater stability, are likely to be used for the foundation design. This type of foundation is buried underground to a depth of approximately 10 to 15 feet with a pedestal that extends approximately 1 foot above ground.

Turbine foundations would be designed based on the findings of a Project-specific, site-specific geotechnical investigation that would be prepared once final turbine locations have been verified. Section 1803 of the California Building Code specifies the required content of geotechnical reports. Existing law requires that the geotechnical investigation be conducted by a registered design professional and in accordance with the provisions of California Building Code



SOURCE: Pacific Wind Development, LLC.

NOTE: Generic turbine profiles are shown, not the specific turbines proposed for this Project. Dimensions of the proposed turbines are as described in Section 2.4, Description of the Project.

Fountain Wind

Figure 2-4a
Typical Wind Turbine

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Section 1803, as may be amended from time to time and as in effect at the time the investigation is conducted. Prior to finalizing the location of each turbine, soil borings would be collected to an approximately 50-foot depth, or as appropriate, to verify soil and rock characteristics and ensure sufficient soil strength and bearing capacity to provide a stable foundation for the turbine. Depending on the final turbine model selected, the widest underground portion of the turbine spread footing foundation would be between 50 to 80 feet in diameter. The aboveground, visible portion of the foundation is anticipated to be similar in diameter to the turbine tower, up to approximately 16 feet in diameter. A step-up transformer would be located either within the turbine nacelle or within a 9-foot by 9-foot reinforced concrete box pad located approximately 5 feet from the tower foundation. A typical turbine site is shown in Figure 4 of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*.

During construction, a temporary work area would be cleared and graded around each turbine, including the area to be occupied by the turbine foundation. The size and configuration of each work area would depend on the turbine site's terrain. Each work area would require an up to 250-foot by 300-foot area for foundation excavation and construction and turbine assembly. A typical work area is 200 feet by 250 feet depending on site conditions. The work area would be used to stage the construction crane, which would be used to hoist turbine sections into place. Depending on site conditions, additional temporary work space may be used for rotor assembly. Temporary work areas would be cleared and leveled to approximately a 2 percent slope or less. Within each work area, a crane pad would be constructed of compacted soil to provide a stable area for crane operation during turbine component installation. The size and location of each crane pad would be determined by the contractor. A portion of the crane pad would be left in place after construction and used for turbine repair or during decommissioning of the Project. Post-construction, a permanent, 15-foot gravel ring would be placed around the base of the foundation to provide a stable surface for maintenance vehicles and to minimize surface erosion and runoff. These permanent turbine pads would be between 65 and 95 feet in diameter, depending on the site conditions and final turbine model constructed. An area up to an additional 2 acres around the permanent turbine pad would be removed from timber production and maintained as low-growing vegetation.

2.4.2 Electrical Collector System and Communication System

A combination of overhead and underground 34.5 kV electrical collector lines would collect energy generated by the turbines and deliver it to an onsite collector substation, described in more detail in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*. A communication system also would be installed within the same footprint. The communication system consists of fiber optic communication cabling for the Supervisory Control and Data Acquisition (SCADA) system, which provides communication capabilities between turbine locations, substation, and operations and maintenance facilities. Most of the collector system would be located underground and adjacent to onsite access roads. However, portions of the collector system may be constructed overhead in response to environmental and engineering constraints such as:

- a large distance from generators to the substation;

- meeting the transmission limits of underground cable (20 to 25 MW);
- steep terrain where the use of a backhoe or trenching machine is infeasible or unsafe;
- stream and wetland crossings and cultural resource sites, where an overhead line would avoid or minimize an impact to the resource; or
- the presence of soils with low thermal conductivity or rocky conditions which could significantly increase trenching costs.

See also Figure 5 and Figure 6 of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*, which show conceptual design details of the proposed underground and overhead collector system.

2.4.2.1 Underground Collector System

The underground collector system would consist of insulated cables buried in trenches that are 46 inches deep and at least 12 inches wide. Each trench would contain power cables, a ground wire, a fiber optic communication cable, and a marker tape above the cables. Cables generally would be co-located with turbine access roads to minimize ground disturbance. In areas where the underground collector system would be co-located with both new and existing access roads, no additional ground disturbance would be required to install the underground electrical collection system beyond that which is disclosed in the impacts for the widening of the road. Where cable trenches cannot be co-located with access roads, a temporary, 50-foot-wide disturbance area would be required to install the cable. During operations, a permanent, 30-foot-wide corridor centered on the buried cable would be maintained clear of woody vegetation. The cables would terminate at individual turbines; the cables would connect from there to junction boxes, overhead power lines, or at the onsite substation. Junction boxes also would be installed on long collector runs between turbine strings. Blasting may be required prior to trenching in rocky areas.

2.4.2.2 Overhead Collector System

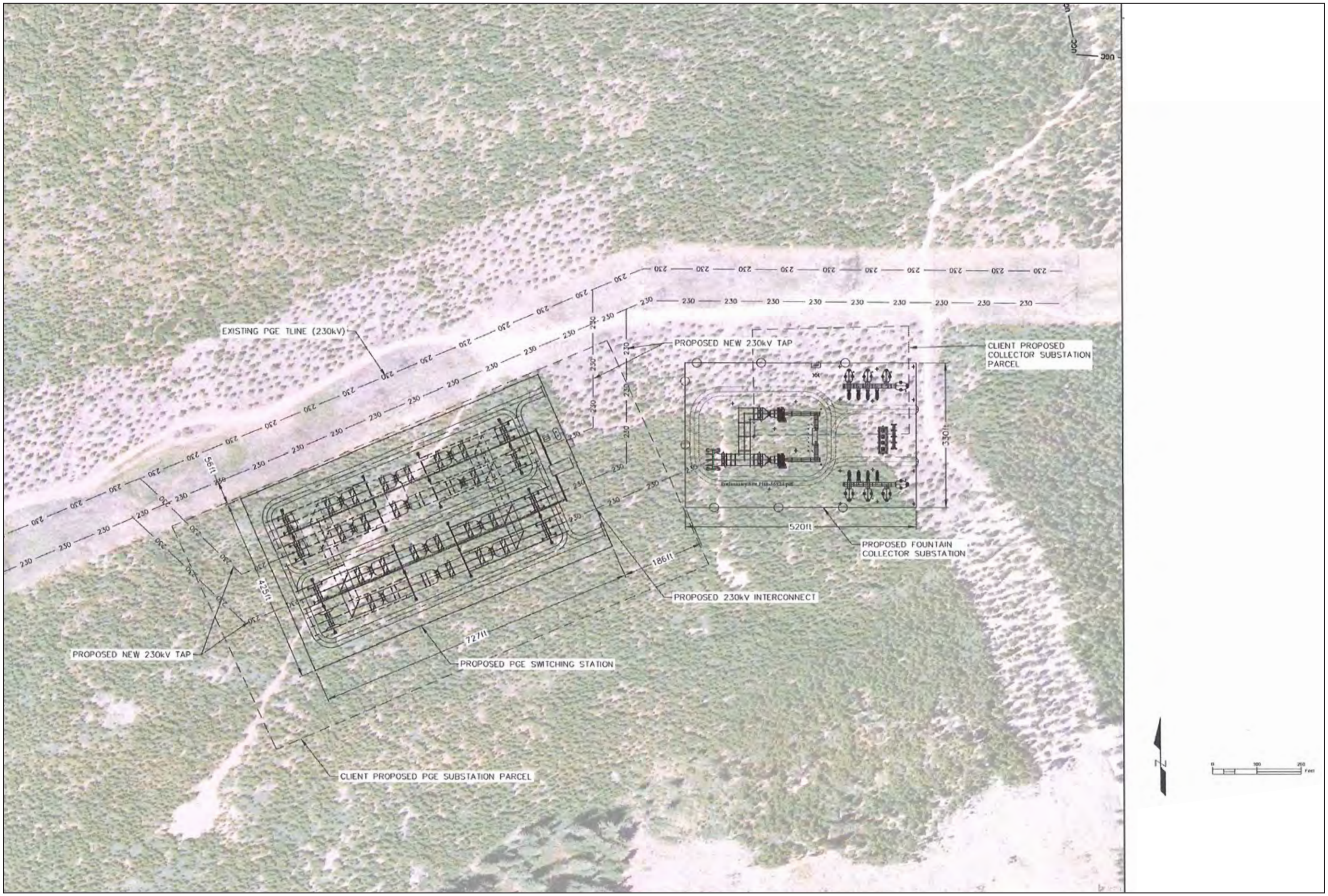
The 34.5 kV overhead electrical collector system would be installed on wood poles with a maximum height of 90 feet and wire heights between approximately 20 to 30 feet above the ground depending on the span; however, special circumstances could require greater wire clearances. Installation of the overhead collector line could require a temporary workspace consisting of an approximately 100-foot-wide corridor centered on the center line of the overhead line. An approximately 80-foot-wide corridor would be maintained during the operations phase. This area would be kept clear of taller woody vegetation to provide for safe operations and allow access for equipment inspections, vegetation control, and maintenance. Permanent disturbance impacts associated with the overhead collector system would be limited to the individual pole locations. All overhead collector lines would be designed in accordance with the Avian Protection Plan Guidelines prepared by the U.S. Fish and Wildlife Service (USFWS, 2005), and the Edison Electric Institute’s Avian Power Line Interaction Committee (APLIC) guidance for reducing avian electrocution risk (APLIC, 2006) and risk of collisions with power lines (APLIC, 2012). Riser poles used to transition underground lines to overhead collectors would be constructed consistent with APLIC guidance for power pole configurations at wind energy projects (APLIC, 2019).

2.4.3 Project Substation, Switching Station and Interconnection Facilities

As described above, an onsite collector substation and switching station would increase the voltage of the electricity from the collection system's 34.5 kV to 230 kV to match the voltage of the existing PG&E 230 kV line. The preliminary substation and switching station designs are depicted in **Figure 2-4b**, *Preliminary Switching Station and Substation Site Plan*. The basic elements of the substation facilities include a control house, a bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lightning-suppression conductors. The main outdoor electrical equipment and control enclosure would be installed on a concrete foundation.

The switching station would be located next to the Project substation and would facilitate the interconnection between the Project's electricity and the PG&E transmission lines. The Project would tap into the existing PG&E 230 kV line via an aboveground line tap located directly adjacent to the switching station. Minor modifications or upgrades to the existing 230 kV line may be required within the Project Site to facilitate the Project's interconnection. Upgrades to PG&E facilities are anticipated to include construction or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, the new poles would be located adjacent to the proposed substation and switching station. Additionally, a relay microwave tower or overhead fiber optic communication circuits could be required. If required, the microwave relay tower would be up to 150 feet tall and would be located within the switching station permanent footprint. The tower would be a self-supporting lattice or lattice mast design and would require either a reinforced concrete slab foundation or a drilled pier foundation. A reinforced concrete slab foundation can be up to approximately 42 inches thick, covering a 25-by-25-foot area. A drilled pier foundation can be approximately 40 feet deep. An antenna system would be mounted on the tower and oriented for optimal communication with PG&E's control and communication system. The Applicant would construct the switching station; PG&E would construct the electrical connections to its facility. PG&E ultimately would own and operate the switching station and interconnection components.

Together, construction of the substation, switching station, and interconnection facilities would temporarily disturb up to approximately 19 acres; the permanent area of disturbance would be approximately 5 acres for the collector substation and 8 acres for the switching station. The permanent footprint of the substation and switching station would include a graveled parking area for maintenance vehicles. The substation and switching station would be enclosed with a chain-link fence. Appropriate safety signs would be posted along roads and around towers, transformers, and other high-voltage facilities in conformance with applicable regulations.



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SOURCE: Avangrid Renewables

Fountain Wind

Figure 2-4b
Preliminary Switching Station and Substation Site Plan

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2.4.4 Other Infrastructure

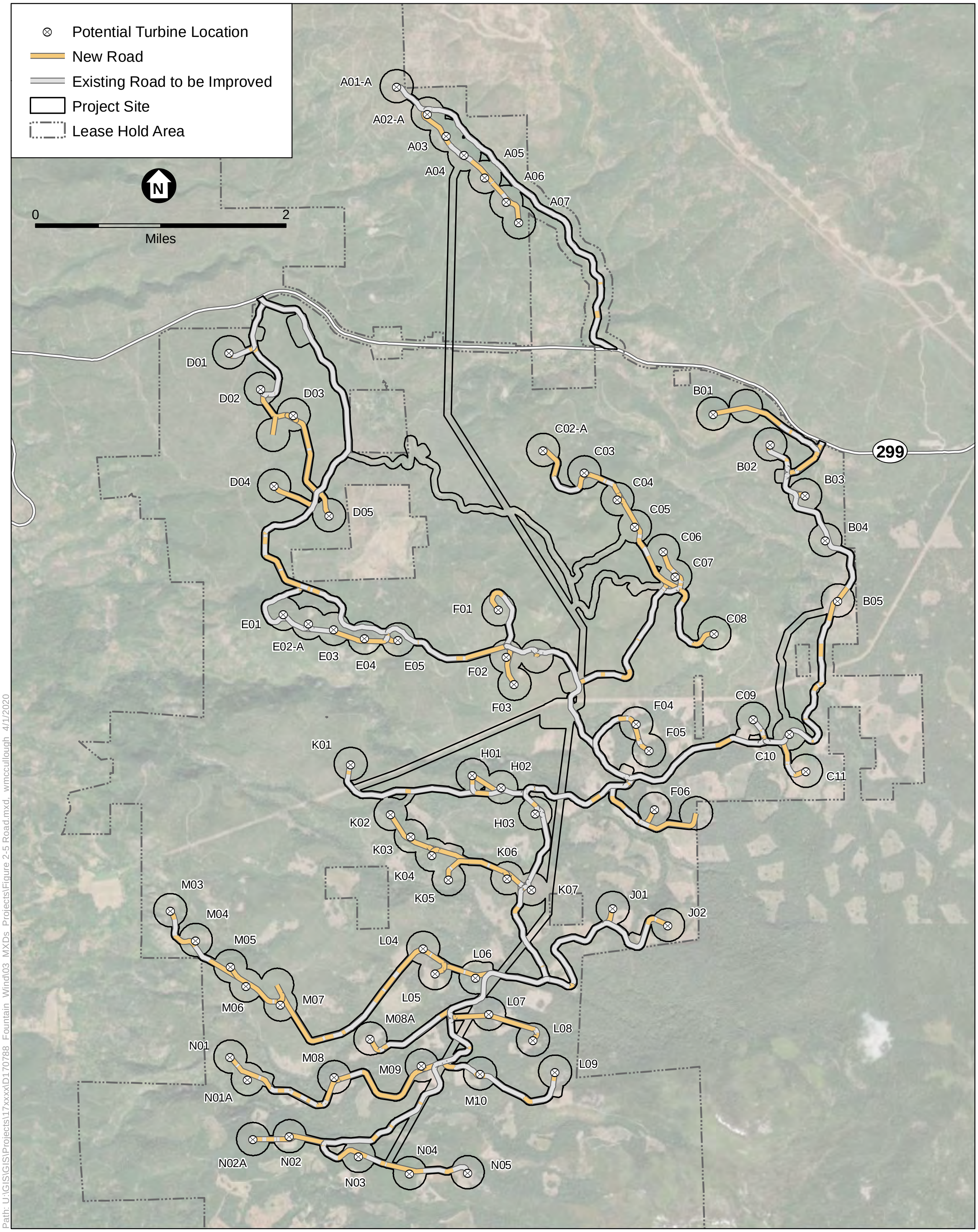
2.4.4.1 Access Roads

The Project Site would be accessed from three existing, gated logging roads located off SR 299 that would remain gated throughout Project construction, operation, and decommissioning. Existing gates may be replaced or reinforced during Project construction. During construction, workers would access the Project Site using the three access points and would park at the O&M facility or at a laydown area. The proposed road system is shown in **Figure 2-5**, *Road Network*. The road layout may be modified as final Project designs are developed to maximize the use of existing roads. Access road cross section details are shown in Figure 7a and Figure 7b of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*. As new roads are built and existing roads are modified, existing culverts would be replaced as needed with wider, stronger culverts to maintain a functional stormwater drainage system. Drainage improvements would be made in accordance with the Project's erosion control plan pursuant to the National Pollution Discharge Elimination System (NPDES) permit, described in more detail in Section 2.4.5.6, *Stormwater Control*. During operation and maintenance activities, the access roads would continue to be used by service vehicles and equipment.

2.4.4.2 Temporary Construction and Equipment Areas

Construction would require an approximately 10-acre cleared, graded, compacted gravel pad for use as a main construction staging area, to store equipment and materials, host construction trailers, refuel equipment, and store construction waste temporarily (i.e., for up to 14 days). Construction waste would be removed weekly or biweekly by a local waste management entity. This area also would provide temporary parking, construction office space (mobile trailers), and temporary sanitary facilities. A vendor-supplied fuel truck would make daily or weekly deliveries to approved storage tanks, which then would be used to refuel construction vehicles. Fuel tank storage capacity would be determined by the construction contractor. Fuel tanks would be maintained and operated according to all local, state, and federal regulations during construction and operation, and hazardous material storage would be detailed in the Spill Prevention, Countermeasure, and Control (SPCC) Plan described in Section 2.4.8.3, *Hazardous Materials*.

Refueling and general maintenance for construction equipment, such as changing fluids and lubricating parts, would occur within this temporary construction and equipment area or other outdoor locations with sufficient containment capabilities and according to measures outlined in the SPCC Plan. Post-construction, the portions of the staging and laydown area not used for permanent operation and maintenance activities would be restored to preconstruction conditions in accordance with applicable plans, such as a Habitat Restoration Plan, Vegetation Management Plan, and Invasive Species Management Plan. These plans would be developed by the Applicant prior to initiating onsite activities and would outline the procedures to be implemented upon the completion of construction to restore and revegetate areas of temporary disturbance and performance standards to measure revegetation success.



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Fountain Wind Project

Figure 2-5
Road Network

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Additionally, during construction, 14 two-acre laydown (staging) areas would be located throughout the Project Site to stage building materials and equipment. The final dimensions of each laydown area would be based on site topography and may be graded and compacted or graveled depending on construction needs and soil conditions. Following construction, the laydown areas would be restored in accordance with the Applicant-proposed Habitat Restoration Plan and Vegetation Management Plan within 1 year following the conclusion of construction. Restoration may occur on a rolling basis as construction is completed in the locations served by each laydown area.

2.4.4.3 Operation and Maintenance Facility

A permanent operation and maintenance (O&M) facility, storage yard, and parking area would be located within an approximately 5-acre fenced area near SR 299. See Figure 2-2; see also Figures 8a, 8b and 8c of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*, which show the proposed O&M facility plan and profile, and Figure 9, which shows a conceptual site plan for the O&M facility. During the Project's operation and maintenance phase, maintenance equipment would be staged in the O&M storage yard. The O&M facility would be served by new or existing domestic wells or water storage tank and an onsite septic system in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division.

2.4.4.4 Meteorological Equipment

Up to four permanent METs would be constructed within the Project Site to measure and record meteorological data to assess the performance of turbines and guide Project operation. These METs would be unguyed and freestanding to minimize impacts on avian species, would be up to 394 feet tall, and would comply with FAA lighting regulations. The Applicant would develop an FAA-approved lighting plan that is expected to specify the installation of flashing red lights on designated METs to improve nighttime visibility.

Mobile meteorological equipment, such as LiDAR and SoDAR systems, also may temporarily be deployed onsite during operation to supplement wind resource data gathered by the permanent METs. No ground disturbance would result from the use of these mobile units.

2.4.5 Site Preparation and Construction

2.4.5.1 Site Preparation

Fencing and Site Security

The Project would be located entirely on private property where public access is currently restricted. The onsite substation would be surrounded by a chain-link fence. Where necessary, safety and "No Trespassing" signs would be posted around towers, transformers, other high-voltage facilities, and along roads in accordance with federal and state regulations. Roads diverging from public access points such as SR 299 would be gated, locked, and setback from SR 299 a minimum 50 feet with a paved apron.

Timber Clearance and Harvesting

Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site to allow development of the Project. Areas that would be removed from timber production as a result of the Project would be harvested in accordance with a Timberland Conversion Permit (TCP) and Timber Harvesting Plan (THP) authorization from the California Department of Forestry and Fire Protection (CAL FIRE). The THP would be drafted in accordance with requirements set forth in the Forest Practice Act (Pub. Res. Code §4582) and the Forest Practice Rules (CAL FIRE, 2019), would be prepared by a Registered Professional Forester, and would be carried out by licensed timber operators. The THP would specify the location of timber to be harvested, how it would be harvested, and environmental best management practices (BMPs) that would be implemented during harvesting. The Applicant would provide the County with written documentation of CAL FIRE's approval of the THP prior to the commencement of onsite activities.

Ground-Disturbing Activities

Construction would include ground-disturbing activities such as clearing and grubbing, topsoil stripping, grading, compaction, utility trenching, soil borings, well-drilling, and the placement of turbine foundations and pads and aggregate surfacing. Grading activities would include the removal, storage, and disposal of soil, gravel, vegetation, organic matter, loose rock, and debris. Native soil excavated in one part of the Project Site would be used as fill in another area to minimize soil import and export. Cut and fill dimensions would be finalized along with engineering designs. Project disturbance areas that would be subject to ground disturbance as a result of these activities are summarized in Table 2-1.

Blasting may be necessary to loosen rock before excavation. If blasting is necessary, the Applicant would prepare a Blasting Plan that identifies the locations where blasting is anticipated to be needed and all applicable regulations for blasting procedures. The Blasting Plan also would specify the times and distances where explosives would be permitted to avoid impacts on sensitive environmental receptors and the human environment. The County and emergency responders would be notified at least 24 hours in advance of blasting. All blasting activities would be conducted in compliance with applicable federal, state, and local laws, and appropriate safety and environmental protection measures would be implemented, including weather restrictions in regards to wildfire risk.

Road Construction and Improvement

The Project Site would be accessed via existing, gated logging roads located off of SR 299. Existing gates may be replaced or reinforced and the roads may be graveled. During construction, new internal access roads would have a 40-foot-wide driving surface plus a 20-foot construction buffer on either side, resulting in an approximately 80-foot-wide disturbance area. In some areas, the construction cleared area could be up to 200 feet wide to accommodate significant cut and fill, stormwater controls, road design, and blade-delivery-vehicle turning radii. New road surfaces would be graded and graveled. The existing logging road network within the Project Site would be widened and modified according to the aforementioned specifications to safely accommodate turbine component delivery vehicles and heavy equipment. Road widening details are provided in

Table 2-1, *Project Components and Disturbance Areas*. Fugitive dust control would include application of appropriate dust suppressants, such as water or surfactants, as necessary during construction.

As new roads are built and existing roads are modified, existing culverts would be upgraded or replaced as needed to maintain a functional stormwater drainage system and meet fire safety and access standards. Individual crossings and culverts would follow appropriate BMPs and comply with all applicable independently enforceable requirements of the U.S. Army Corps of Engineers and California Department of Fish and Wildlife (CDFW) for in-stream activities, including CDFW requirements relating to fish passage. Drainage improvements would be made in accordance with the Project's erosion control plan pursuant to the NPDES permit described in Section 2.4.5.6, *Stormwater Control*.

During operation, access roads would continue to be used by service vehicles and equipment for maintenance activities. After construction, permanent access roads would be reduced to a 20-foot driving surface with a 1-foot shoulder. An additional 10 feet on either side may be required in some areas to accommodate stormwater drainage. Permanent access roads would be periodically graded and compacted to minimize erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly. Permanent access roads would be used both for Project operation and continued timber management, and the Project operator and timber operator would share responsibility for maintaining these areas. Maintenance would be done at a frequency dictated by environmental conditions onsite.

Domestic Well Installation

New water wells may be required during construction and operation. Domestic well installation, if determined by the Applicant to be needed or desirable for Project purposes, would occur at the location of the proposed O&M facility and be performed using typical truck mounted drilling equipment and in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division (Shasta County EHD, 2019). The number of new wells to be installed would be determined based on an agreement with the landowner. Alternatively, the Burney Water District could supply domestic water to serve Project needs. The Project's estimated water demand is discussed in Section 2.4.8.1, *Water and Wastewater*.

2.4.5.2 Construction Sequence

Initial construction activities would include widening existing access roads and constructing new access roads. Temporary staging and laydown areas also would be established to store turbine components and other Project equipment. A 5-acre area would be cleared around each turbine location to create a crane pad, construction laydown area, and rotor assembly area. Once turbine foundations are constructed, the turbines would be assembled and erected using forklifts and cranes. Construction of the substation, underground and overhead collection system, and O&M building would be concurrent with turbine installation. Upon the conclusion of construction, final testing would begin to ensure that all systems are functioning properly. As construction activities are completed, temporary staging and laydown areas would be restored to preconstruction conditions. As part of a final site cleanup, all waste materials would be removed from the Project Site.

Throughout construction, all construction activities would be implemented consistent with NPDES permit requirements and the Storm Water Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control (TESC) Plan described in Section 2.4.5.5, *Stormwater Control*.

2.4.5.3 Materials Delivery

Delivery of Project components would be coordinated through the California Department of Transportation (Caltrans) and County encroachment permit processes and timed to minimize traffic disruptions. These permit processes would determine final trailer configuration, clearance requirements, emergency service access, lane closures (if necessary), California Highway Patrol escort (as required), and transportation times. For purposes of this analysis, all materials would be delivered to the Project Site by truck.

Turbines. Delivery plans would be finalized once a final turbine model and supplier is selected. In general, towers are expected to be delivered in three to six sections. Turbine components such as blades, nacelles, rotors, controllers, ladders and platforms, pad-mounted transformers, pad-mounted transformer vaults, and turbine switchgear would be delivered separately. Up to 15 separate delivery loads would be needed for each turbine. Of these, eight or nine deliveries would be classified as oversize according to California Vehicle Code Division 15, *Size, Weight, and Load*, for highway transportation, and would require oversize vehicle permits and/or variances[7] from Caltrans. Turbine component delivery vehicles would generally conform to road weight limits, and any deviations from these weight limits would be specified in oversize permit applications submitted to Caltrans. Additionally, cranes used to assemble turbine components would be delivered in multiple loads and assembled onsite.

Aggregate. Up to three temporary concrete batch plants (each between 3 and 5 acres) may be located within the onsite temporary construction and equipment area to facilitate cement delivery for foundations. Aggregate is expected to be sourced locally from the Burney area, but could be supplied from as far away as Redding. The batch plants would be removed following construction. Each batch plant would require a stand-alone generator as well as fuel, aggregate, cement, and water for operation. Stockpiles of sand and aggregate, which would be delivered by truck, would be located near each batch plant in a location that would minimize exposure to wind. Cement would be discharged via screw conveyor directly into an elevated storage silo without outdoor storage. The construction managers and crew would use BMPs and standard operating procedures to keep the plant, storage, and stockpile areas clean and to minimize the buildup of fine materials that could result in fugitive dust or offsite sedimentation.

Project construction is anticipated to generate approximately 12,070 total material delivery truck trips (east and west combined), or an average of 124 material delivery truck trips per day. Material delivery trucks could carry aggregate, turbine-related components, concrete, water, and other construction-related materials (**Appendix H**, *Transportation*). The Applicant anticipates that the bulk of materials would be delivered by truck from locations no more than 50 miles from the Project Site. Prior to arrival onsite, large components such as turbine blades are likely to be delivered by truck, barge, or rail to existing regional storage yards.

7 Variances would be required for oversized loads, i.e., those with a width over 15 feet and/or length over 135 feet.

2.4.5.4 Construction Equipment

Equipment types and use assumptions by phase to construct the Project are identified in **Table 2-2**, *Construction Equipment List*.

TABLE 2-2
CONSTRUCTION EQUIPMENT LIST

Phase	Workdays	Equipment Type	Number	Hours/day
Timber Removal and Grubbing	80	Feller Buncher (logging)	2	8
		Logging Trucks	8	8
		Skidder	2	8
		Pickups	8	8
		Hydro Axe	2	8
Grading and Access Road Work	160	Road Grader	3	8
		Scraper	4	8
		Bulldozer (medium)	6	8
		Drum Compactor	4	8
		Rock Trucks	8	8
		Pickups	16	8
		Water Truck	6	8
Concrete Batch Plants	70	Concrete Pump Truck	2	8
		Mixer	10	8
		Generator	3	8
		Skid Steer Loader	3	8
		Pickups	6	8
		Water Truck	3	8
Turbine, Transformer, Substation, and O&M Foundations	70	Excavator	3	8
		Bulldozer (medium)	3	8
		Drum Compactor	4	8
		Skid Steer Loader	3	8
		Pickups	10	8
		Mobile Hydraulic Crane	3	4
Turbine and Transformer Installation	100	Mobile Hydraulic Crane	6	4
		Bulldozer (medium)	2	8
		Rubber Tired Forklifts	10	8
		Large Crawler Crane	4	8
		Pickups	20	8
		Turbine Delivery Vehicles	8	8
		Generator	4	8
Substation and O&M Building Installation	160	Mobile Hydraulic Crane	2	4
		Skid Steer Loader	2	8
		Pickups	8	8
		Rubber Tired Forklift	3	8

TABLE 2-2 (CONTINUED)
CONSTRUCTION EQUIPMENT LIST

Phase	Workdays	Equipment Type	Number	Hours/day
Underground Collector System	140	Trenching Equipment	4	8
		Rubber Tired Forklift	4	8
		Pickups	12	8
		Bulldozer (medium)	1	8
		Skid Steer Loader	4	8
Overhead Collection System	100	Backhoe Loader (includes setting collector system poles)	4	8
		Cable Reel Truck (includes auger for pole foundations)	3	8
		Mobile Hydraulic Crane	2	4
		Pickups	10	8
		Bulldozer (medium)	1	8
		Boom Lift	6	4
	5	Helicopter	1	8
Substation Aggregate and Security Fence	15	Skid Steer Loader	1	8
Transmission Line Connection	20	Mobile Hydraulic Crane	6	4
		Cable Reel Truck (includes auger for pole foundations)	4	8
		Boom Lift	6	4
		Pickups	8	8
		Bulldozer (medium)	1	8
		Excavator	2	8
	1	Helicopter	1	8

SOURCE: Fountain Wind, 2020, with revisions to use hours per day to reflect equipment operator breaks, etc., during the 10-hour workday.

2.4.5.5 Construction Schedule and Workforce

Project construction is expected to last 18 to 24 months. Generally, construction would occur during daylight hours from 7 am to 5 pm but could vary during summer or winter months, to accommodate specific construction needs or site conditions, to avoid traffic or high winds, or to facilitate the Project schedule. The Project would require up to 400 workers, some of whom would be local workers, and others would be specialized workers that may reside outside the local area. Non-local workers would stay at local hotels and commute to the Project Site. No new temporary worker lodging is expected to be constructed as part of the Project. Workers would most likely commute from Redding, Burney, Fall River Mills, or McArthur (**Appendix H**).

2.4.5.6 Stormwater Control

To minimize impacts on drainage and runoff, the Project would maintain onsite surface drainage patterns to the extent possible. Newly-constructed access roads would be designed to follow natural contours and minimize hill cuts. Ditches and culverts would be incorporated into road design to capture and convey storm water runoff. Except in areas where permanent recontouring is required, disturbed areas would be restored to preconstruction conditions.

In accordance with the Construction General Permit (USEPA, 2017), the Applicant would prepare a site-specific SWPPP for the Project that would identify BMPs to be used to minimize or eliminate pollution, erosion, and sedimentation. The Applicant also would prepare a TESC Plan, which would be implemented and maintained by the construction contractor throughout operation to further reduce the potential for erosion. Measures included in the TESC Plan would be comparable in effect to those described by the Center for Environmental Excellence by the American Association of State Highway and Transportation Officials (AASHTO, 2019).

2.4.6 Operation and Maintenance

Although upgrading and replacing equipment could extend the operating life of the wind energy facility indefinitely, for CEQA purposes, the life of the Project would be coterminous with the term of the use permit that is required for its operation, i.e., 40 years.

The Applicant would prepare a Project-specific Fire Prevention Plan (FPP) prior to the commencement of onsite activities that would remain in place for the life of the Project. The FPP would include procedures for emergency response, evacuation, fire agency notification, and fire prevention. Tree removal and maintenance of fire breaks also would be disclosed in the CAL FIRE TCP and THP. The FPP also would require the Applicant's and construction contractors' vehicles and personnel to be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. The Applicant's FPP would be prepared consistent with the directives in the Shasta County Fire Safety Standards (Shasta County, 2017), the Forest Practice Rules (CAL FIRE, 2019), and CAL FIRE's Shasta–Trinity Unit Strategic Fire Plan (CAL FIRE, 2017).

Project operation would require up to 12 full-time employees. Operation and maintenance activities would occur from Monday to Friday during normal working hours. The Project operator would monitor turbines through the SCADA monitoring system 24 hours a day, seven days a week. This system would allow the Applicant to perform self-diagnostic tests and would allow a remote operator to perform system checks, establish operating parameters, and ensure that the turbines are operating at peak performance. In the event of winds, gusts above the maximum operating parameters or red flag alerts, the turbines would automatically shut down.

Maintenance of turbines and associated infrastructure includes a wide variety of activities. The Applicant would develop an O&M protocol to be implemented throughout Project operation. This protocol would specify routine turbine maintenance and operation in accordance with the maintenance requirements prescribed by the turbine manufacturer. Some unscheduled maintenance and repair would be necessary. Routine maintenance activities are expected to include, but not be limited to: checking torque on tower bolts and anchors; checking for cracks and other signs of stress on the turbine tower and other turbine components; inspecting for leakage of lubricants, hydraulic fluids and other hazardous materials, and replacing them as necessary; inspecting the grounding cables, wire ropes and clips, and surge arrestors; cleaning; and repainting. Most routine maintenance activities would occur within and around the tower and the nacelle. Cleanup from routine maintenance activities would be performed at the time maintenance is performed. While performing most routine maintenance activities, O&M staff would travel via pickup or other light-duty trucks.

Scheduled maintenance activities would include servicing the turbines twice a year or as needed, and may require the use of a crane within the 65- to 95-foot diameter maintained areas around the turbines. Turbine servicing would require maintenance staff to climb towers and service turbine parts by performing activities such as removing the turbine rotor and replacing generators and bearings. Project operation would require utility vehicles, cranes, and other equipment for Project maintenance activities. Non-routine maintenance such as repair or replacement of rotors or other major components, if needed, could involve use of one or more cranes and equipment transport vehicles. Permanent access roads would be periodically graded and compacted in order to minimize erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

2.4.7 Decommissioning and Site Restoration

Proposed decommissioning of existing facilities and infrastructure and restoration of the Project Site would require approximately 18 to 24 months. Decommissioning refers to the dismantling and removal of the Project's facilities, including power generation equipment. Removal of turbine components and related infrastructure would include dismantling the turbines, support towers, transformers, substation, switching station, and foundations; excavating them to a depth of approximately 3 feet below grade; and removing them from the Project Site to be reused, recycled, or sold. Some roads no longer needed to access turbines, e.g., once turbines have been dismantled and removed, would be allowed to naturally revegetate. If a domestic well(s) is installed as described in Section 2.4.4.3, it would remain onsite. Underground collection and communication cables would be abandoned in place.

The types of equipment, vehicles, and workforce necessary to decommission the Project would be generally similar to the requirements for construction, except considerably less intensive in that no concrete batch plant(s), cable delivery, or concrete trucks would be required, and no cable trenching or similar work would occur. Moreover, existing service roads would be used; no new access roads or road widening would be required. All management plans and BMPs developed for Project construction also would apply during the decommissioning phase of the Project.

Site restoration refers to recontouring and revegetating the site upon completion of the Project's operational life to be as similar to preconstruction conditions as possible. In coordination with the land owner, disturbed areas would be replanted with trees or other appropriate vegetation. The goal of site revegetation would be to develop a vegetation cover, composition, and diversity similar to the area's ecological setting and consistent with the landowner's current and future land use practices.

Prior to operation of the Project, the Applicant would prepare a Draft Decommissioning Plan that details a restoration plan and how Project facilities and infrastructure would be removed. The Draft Decommissioning Plan would be revised and finalized prior to Project operations. The Applicant or its contractor would implement the Final Decommissioning Plan upon cessation of

Project operations. The Final Decommissioning Plan would include plans and procedures for facility dismantling and removal, disposal and recycling, site restoration, and habitat restoration and monitoring and would be developed in compliance with standards and requirements at the time of site decommissioning. The Director of Resource Management would review and approve the Final Decommissioning Plan. The applicant would be required to annually estimate the cost of decommissioning based on a scenario where it is necessary to implement the Final Decommissioning Plan as a public works project. The applicant would also be required to post and update a financial assurance mechanism to cover the cost of the annual decommissioning cost estimate. Both the annual estimate and financial assurance mechanism would be reviewed and approved by the Director of Resource Management in a manner similar as is carried out for reclamation plans concerning mining operations throughout the County.

2.4.8 Water, Wastewater, Waste, and Hazardous Materials

2.4.8.1 Water and Wastewater

Project construction and long-term operation includes the use of potable water from one or more new onsite water supply wells to be drilled at the O&M facility location or from the importation of water by truck from the Burney Water District, which is located approximately 6miles east-northeast of the Project Site. Any wells installed onsite would be constructed in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. A Water Supply Assessment has been prepared for the Project in accordance with Water Code requirements. A copy is provided in **Appendix I**.

Project construction would require up to 49 acre-feet of water for dust control, soils compaction, and concrete manufacture, emergency fire suppression, and other activities. Out of the 12,070 total material delivery trips, approximately 1,338 truck trips (each way) are estimated for the delivery of water during construction.

Operation and maintenance of the Project would require up to 5.6 acre-feet of water per year (approximately 5,000 gallons per day) for vehicle and equipment washing and maintenance, potable water supplies for 12 full-time employees, and water storage to meet Shasta County fire flow requirements.[8] Water for the O&M building would be supplied either by an onsite well or by a storage tank located at the O&M building that periodically (e.g., monthly) would be filled by a water truck. No additional permanent water tanks are proposed to be installed as part of the Project. Water use during decommissioning and site restoration would be limited to use for fire protection and dust suppression.

During construction, portable toilets would be provided for the construction workforce. These facilities would be serviced on a regular basis by a contractor who would dispose of sanitary wastewater pursuant to applicable regulations. Wastewater from the O&M facility would be processed using an onsite septic system.

8 Fire flow requirements may be found in the Shasta County Code of Ordinances, Title 16 Buildings and Construction, Chapter 16.04.130 Fire Standards and Equipment (Ordinance No. 2019-06 [2019]) and the 2019 California Fire Code (24 Cal. Code Regs. Part 9).

2.4.8.2 Waste

During construction, approximately 10,000 pounds of solid waste would be generated per week. Construction debris (e.g., scrap lumber and metal) and operational debris (e.g., office waste and some paper waste) would be collected by either the construction contractor or Burney Disposal Inc. Waste would be transported to the Burney Transfer Station and ultimately disposed of or recycled at the Anderson Landfill in accordance with federal, state, and local solid waste regulations. Decommissioning and restoration would generate the same amount of solid waste as the construction phase (10,000 pounds per week). The Applicant would handle and dispose of solid waste in accordance with all regulatory requirements and would implement standard BMPs with regard to solid waste.

2.4.8.3 Hazardous Materials

Table 2-3, *Hazardous Materials*, depicts the types, uses, and quantities of hazardous materials that are expected to be used during the site preparation and construction, operation and maintenance, and decommissioning and site restoration phases of the Project.

During all Project phases, activities may involve the transportation, use, or storage of a variety of hazardous materials, including batteries, hydraulic fluid, diesel fuel, gasoline, propane, antifreeze, dielectric fluids, explosives, herbicides, grease, lubricants, paints, solvents, and adhesives.

In accordance with requirements contained in the Health and Safety Code and the California Code of Regulations, the Applicant would prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan (HMBP/SPCC) prior to construction. The HMBP would include BMPs for the transport, storage, use, and disposal of hazardous materials and waste. The HMBP also would include information regarding construction activities, worker training procedures, and hazardous materials inventory procedures. Prior to operation, the Applicant would update the HMBP (including the BMPs) with information about the types of hazardous materials that would be used during operation. The HMBP/SPCC would comply with the requirements of these federal, state, and local requirements (see, e.g., 40 CFR Part 112).

During construction, waste disposal and collection receptacles would be located onsite to ensure proper disposal of hazardous materials. Operation and maintenance of the Project would not require as many hazardous materials as construction or decommissioning. During operation, hazardous materials would be stored in the O&M facility and storage sheds. Nonhazardous batteries would be stored at the substation. Monthly inspections of each of these facilities would occur to check for leaks and spills.

During construction, operation, and decommissioning, all fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment area consisting of an impervious floor and bermed sidewalls. Fuel would be stored in aboveground storage tanks. These tanks may have either a double wall or would be placed within temporary, lined, earthen berms for spill containment. Upon the conclusion of construction and decommissioning phases, excess fuels would be removed from the site and any surface contamination resulting from fuel handling operations would be remediated.

TABLE 2-3
HAZARDOUS MATERIALS

Hazardous Material	Uses	Typical Quantities
Diesel[a]	Fuel for construction and transportation equipment during construction and decommissioning. Used to power an emergency generator during operation, if needed.	Over 5,000 gallons would be stored in aboveground tanks during construction and operation. The amount of diesel to be stored onsite during decommissioning is unknown at this time but is assumed be similar to that of construction.[b]
Gasoline	Some construction equipment and transportation vehicles.	Gasoline would not be stored onsite during any phase of the Project.
Propane[a]	Ambient heating of the O&M building.	Approximately 500 to 1,000 gallons stored in an aboveground propane storage vessel.
Lubricating oils/ grease/hydraulic fluids/gear oils	Lubricating oil would be present in some turbine components, in the diesel engine of the emergency generator, and in engines of construction and transportation equipment.	Limited quantities would be stored in portable containers (capacity of 55 gallons or less) and maintained onsite during all phases of the Project.
Glycol-based antifreeze	Used in wind turbine components for cooling (approximately 5 to 10 gallons are present in the cooling system for the transmission. Used in the diesel engine for the emergency generator.	Limited quantities (10 to 20 gallons of concentrate) would be stored onsite during each phase of the project.
Lead-acid storage batteries and electrolyte solution	Present in construction and transportation equipment. Backup power source for control equipment, tower lighting, and signal transmitters.	Limited quantities of electrolyte solution (<20 gallons) for maintenance of construction and transportation equipment during construction and decommissioning.
Other batteries (e.g., nickel-cadmium batteries)	Used in some control equipment and signal-transmitting equipment.	These batteries would not be maintained onsite.
Cleaning solvents	Organic solvents would be used for equipment cleaning and maintenance when water-based cleaning and degreasing solvents cannot be used.	Limited quantities or organic solvents (<55 gallons) would be stored onsite during construction and decommissioning to maintain construction and transportation equipment. Limited quantities (<10 gallons) of water-based cleaning solvents would be stored onsite during operation.
Paints and coatings[c]	Used for corrosion control on exterior surfaces of turbine towers.	Limited quantities would be used for touch-up painting during construction (<50 gallons) and for maintenance during operations (<20 gallons).
Dielectric fluids[d]	Used in electrical transformers, bushings, and other electric power management devices as an electrical insulator.	Some transformers may contain more than 500 gallons of dielectric fluid. Onsite transformers each contain approximately 10,000 gallons of mineral oil.
Explosives	May be necessary for excavation of tower foundations in bedrock or creating construction access, onsite roads, or grade alterations.	Limited quantities necessary to complete the task would be stored onsite. Onsite storage is expected to occur only for limited periods of time and as needed for specific construction activities.
Herbicides	May be used for vegetation control around facilities for fire safety.	If deemed necessary, herbicides would be brought to the site and applied by a licensed applicator.

NOTES:

[a] Diesel fuel and propane would be replenished onsite by commercial vendors as necessary.

[b] These values represent the total onsite storage capacity, not the total amount of fuel which would be consumed during Project construction.

[c] It is presumed that all wind turbine components, nacelles, and support towers would be painted at their respective points of manufacture. No wholesale painting would occur onsite; only limited amounts would be used for touch-up purposes during construction and maintenance phases. It is assumed that the coatings applied by the manufacturer during fabrication would be sufficiently durable to last throughout the equipment's operational period and that no wholesale repainting would occur.

[d] It is assumed that the majority of transformers, bushings, and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication and would not require dielectric fluid to be added onsite. It is assumed that servicing of electrical devices that involves wholesale removal and replacement of dielectric fluids would not occur onsite and that equipment requiring such servicing would be removed from the site and replaced. New transformers, bushings, or electrical devices are expected to contain mineral oil-based, or synthetic dielectric fluids that are free of polychlorinated biphenyls. Some equipment may instead contain gaseous dielectric agents (e.g., sulfur hexafluoride) rather than liquid dielectric fluids.

SOURCES: Stantec, 2018 (in Draft EIR Appendix J); ConnectGen, 2019.

All equipment (particularly equipment operating in or near a drainage or in a basin) would be maintained in good working condition, and free of leaks. All vehicles would be equipped with drip pans during storage to contain minor spills and drips. No refueling or storage would take place within 100 feet of a drainage channel or other sensitive resource. Spill kits would be located onsite and in vehicles for use in spill response. In addition, all maintenance crews working with heavy equipment would be trained in spill containment and response.

2.5 Description of Alternatives

CEQA requires a lead agency to analyze a reasonable range of alternatives to a proposed project that could feasibly attain most of the basic objectives of the project while substantially reducing or eliminating significant environmental effects. CEQA also requires an EIR to evaluate a "no project" alternative to allow decision-makers to compare impacts of approving a project with the impacts of not approving it. This section describes the key considerations used to identify and screen potential alternatives, explains why some potential alternatives were eliminated from further consideration, and describes the alternatives that were carried forward for additional analysis.

2.5.1 Alternatives Development and Screening

The County screened and thereafter selected alternatives to be discussed based on the following key provisions of the CEQA Guidelines (14 Cal. Code Regs. §15126.6):

- The discussion of alternatives shall focus on reasonable, feasible alternatives to the proposed project or its location that are capable of avoiding or substantially lessening any significant effects of the proposed project, even if these alternatives would impede to some degree the attainment of the proposed project objectives, or would be costlier.
- The No Project Alternative shall be evaluated, along with its impacts. The no project analysis shall discuss the existing conditions at the time the notice of preparation was published, as well as what would be reasonably expected to occur in the foreseeable future if the proposed project were not approved, based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a "rule of reason," meaning the EIR must evaluate only those alternatives necessary to permit a reasoned choice.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

The range of feasible alternatives is selected and discussed in a manner to foster meaningful public participation and informed decision making. Among the factors that may be taken into account when addressing the feasibility of alternatives (as described in CEQA Guidelines §15126.6[f][1]) are environmental impacts, site suitability, economic viability, social and political acceptability, technological capacity, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the proponent could reasonably acquire, control, or otherwise have access to an alternative site.

Among the factors that may be considered in determining not to carry a potential alternative forward for more detailed consideration in an EIR are:

1. Whether the alternative would meet most of the basic project objectives. Section 2.3, Project Objectives, identifies nine Project objectives. Of these, the County has determined the following to be the "most basic" project objectives: Provide up to 216 MW of wind energy to PG&E's Northern California grid, create temporary and permanent jobs in the County, and contribute to the County's tax base. Any alternative determined not to meet these most basic of the Project objectives was not carried forward for more detailed review.

2. Whether it would be "feasible," where feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (Pub. Res. Code §21061.1; CEQA Guidelines §§15126.6, 15364). Any alternative determined to be infeasible was not carried forward for more detailed review.

3. Whether it would be able to avoid or substantially lessen any of the potentially significant impacts of the Project. The County used a liberal definition of "potentially significant" at the outset of the CEQA process that was informed in part by the Scoping Process to identify resource areas where the Project could have a potential to cause significant impacts. The results of this initial inquiry are provided in **Table 2-4**, Preliminary Summary of Potentially Significant Environmental Impacts. Any alternative determined not to avoid or substantially lessen the potential impacts identified in Table 2-4 was not carried forward for more detailed review.

4. Whether its implementation is remote or speculative. Any alternative determined to be remote or speculative was not carried forward for more detailed review.

TABLE 2-4
PRELIMINARY SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Issue Area	Impact - Would the alternative reduce potential project impacts on:
Aesthetics	• Daytime and nighttime views of the proposed turbines, overhead power lines, and areas cleared for Project purposes?
Air Quality	• Increased PM10 emissions in a region of non-attainment for the PM10 state ambient air quality standard?
Biological Resources	• Wildlife species including birds and bats that inhabit, nest in, pass or migrate through, or forage within the Project Site? • Forest habitat, including fragmentation and edge effects? • Aquatic habitats (e.g., lakes, streams, and associated riparian habitats, including wetlands) from erosion?
Hydrology and Water Quality	• Sources of drinking water from erosion or hydrologic disruption? • The water quality of headwaters and surface waters for: Hatchet Creek, Montgomery Creek, the South Fork of Montgomery Creek, Goat Creek, Indian Springs, Willow Creek, Cedar Creek, Blue Lake, Little Cow Creek, the North Fork of Little Cow Creek, Mill Creek, Cheddar Creek, Sawdust Creek, and Buffum Creek from erosion or other contamination?
Transportation Emissions/Noise	• Vehicle-emissions-related air quality, and noise due to anticipated delays on SR 299 during materials delivery?
Tribal Cultural Resources	• The viewshed of Yet-Tey-Cha-Na (Lassen Peak) and Kohm Yamani (Snow Mountain), which are held sacred by the Pit River Tribe and Tribal members? • The ridgetop trail identified by the Tribe and its members during scoping and as shown on General Land Office Maps? • Birds traditionally important to the Pit River culture (e.g., eagles and eagle nests, osprey, ducks, and geese)? • Audible and physical disruption of an area identified by Native Americans as culturally significant?

CEQA also makes clear that an EIR must include "sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Project" (CEQA Guidelines §15126.6[d]). This EIR considers three alternatives to the Project. The No Project Alternative is described in Section 2.5.3.1; Alternative 1, *South of SR 299*, is described in Section 2.5.3.2; and Alternative 2, *Increased Setbacks*, is described in Section 2.5.3.3.

2.5.2 Alternatives Rejected from Detailed Consideration

2.5.2.1 Off-site Alternatives

Scoping comments suggested that the County consider off-site alternatives, including replacing the current proposal with an off-shore wind facility or with an on-shore facility far from the proposed site. Specific recommendations for more distant locations included Modoc County, Tehama County, Contra Costa County's Altamont Pass, Kern County's Tehachapi Pass, and Riverside County's San Gregorio Pass. However, off-site alternatives were not carried forward for more detailed consideration.

CEQA does not expressly require a discussion of alternative project locations (Pub. Res. Code §§21001[g], 21002.1[a], and 21061). CEQA Guidelines Section 15126.6(a) requires a description of "a range of reasonable alternatives to the project, or to the location of the project," suggesting that a lead agency may evaluate onsite alternatives, off-site alternatives, or both. For the Fountain Wind Project, the County has elected (consistent with CEQA) to evaluate only onsite alternatives. As the California Supreme Court has emphasized, "the keystone of regional planning is consistency—between the general plan, its internal elements, subordinate ordinances, and all derivative land-use decisions. Case-by-case reconsideration of regional land-use policies, in the context of a project-specific EIR, is the very antithesis of that goal." *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 572–73. Because the land use and planning provisions that govern use of the proposed site contemplate potential wind energy use (Shasta County Code of Ordinances §17.08.030), the County has elected not to reconsider those determinations in the context of this EIR and instead is focusing on whether an environmentally superior version of the Project exists within the Project Site. This approach is consistent with the court's conclusion in *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App.4th 477, 492 ("Because the proposed project is consistent with the City's existing plans, policies and zoning, we conclude a review of alternative sites was not necessary.")

2.5.2.2 Repowering Alternative

Scoping comments suggested as an alternative to the Project that the Applicant repower one or more of its existing wind facilities, including Dillon, Tule Wind, Phoenix Wind, Manzana Wind, Mountain View III, and Shiloh. Information about each of these past projects is provided in **Table 2-5**, *Repowering Alternative Options*.

The potential Repowering Alternative was not carried forward for more detailed consideration for the same reasons the potential off-site alternatives were not (see Section 2.5.2.1).

TABLE 2-5
REPOWERING ALTERNATIVE OPTIONS

Project	Megawatts	Location
1. Dillon Wind	45	San Gorgonio Pass (Riverside County and the City of Palm Springs)
2. Phoenix Wind	2.1	Riverside County
3. Mountain View III	22.4	Riverside County
4. Tule Wind	131	San Diego County
5. Manzana Wind	189	Kern County
6. Shiloh Wind	505	Solano County

SOURCES: BLM, 2012; CEC, 2019a; EDF Renewables, 2019; Renewable Energy World, 2014; USGS, 2019a, 2019b.

The County elected not to carry a repowering alternative forward for additional, separate and independent reasons as well. For example, projects 1, 2, 3, 4, and 5, as identified in Table 2-5, were not carried forward for more detailed review because they would not meet the basic objectives of the Project because they would not provide 216 MW of wind energy to PG&E's Northern California grid (NP15) and would not create temporary or permanent jobs within the County: Projects 1 through 4 are located in Riverside and San Diego counties, which are not part of NP15 and are not in PG&E's electric service territory (PG&E, 2014); and project 5 was recently commissioned and does not provide sufficient capacity to meet the basic objectives of the Project. Project 6, as identified in Table 2-5, already is the largest re-powering project in the United States and also is not a current candidate for repowering: Shiloh Wind, originally installed in 1989, was repowered in four phases between 2005 and 2012 (CEC, 2019c). Research from the National Renewable Energy Laboratory (NREL) indicates that wind projects "less than 20 years old are expected to be capable of generating a favorable revenue stream for several more years" (Lantz et al., 2013). Because of where that project is in its overall "lifespan," repowering it was not carried forward for more detailed consideration. Finally, none of the six projects are owned or controlled by the Applicant or the County and thus neither has the legal means or right to repower them.

2.5.2.3 Alternative Technologies

Hydroelectric Power

Members of the public suggested during the scoping process that the County consider a hydroelectric power alternative to the Project. Several private hydroelectric projects are located in Shasta County. Of them, those that ring the Project Site to the north, west, and south include: H0240 Burney Creek (3 MW), H0321 Hatchet Creek (7 MW), H0168 Montgomery Creek (2.6 MW), H0271 Kilarc (3 MW), and H0507 Bear Creek (3.2 MW) (CEC, 2015; CEC, 2019b). The largest private hydroelectric projects in Shasta County are both on the Pit River: H0250 James B. Black (172 MW) and H0393 Pit 7 (112 MW) (CEC, 2015). Two federal hydroelectric projects also are located in Shasta County: Shasta Dam and Keswick Dam, both are U.S. Bureau of Reclamation public works projects that cross the Sacramento River. The Shasta Dam is capable of generating 710 MW (U.S. Bureau of Reclamation, 2020a); the Keswick Dam has capacity to generate 105 MW (U.S. Bureau of Reclamation, 2020b).

The County initially considered a hydroelectric power alternative, but did not carry it forward for more detailed review because it would not meet the basic objectives of the Project of providing up to 216 MW of wind energy. The largest of the existing private hydropower facilities in the County produces less than 80 percent of the proposed nameplate capacity of the Project. Further, the most significant waterways within the Project Site (i.e., the north and south forks of Montgomery Creek and Little Cow Creek) are much smaller and would not have the same generating capacity as the Pit River, where the two largest existing private hydropower projects are located, or the Sacramento River, where the two federal hydropower projects are located.

A hydropower alternative also has not been carried forward for detailed review because its feasibility would be speculative: while the potential alternative would avoid the potential significant aesthetic impact of the Project, its potential impacts on existing water rights holders, water quality, wildlife (including aquatic wildlife), and cultural and tribal cultural resources could be equally or more significant than those of the Project. As noted above, there also are questions about the site suitability for hydroelectric use, since onsite streams would not have sufficient hydropower generation capacity to provide a reasonable alternative to the Project.

Cogeneration

Members of the public suggested during the scoping process that the County consider a cogeneration alternative to the Project. Following initial consideration, the County elected not to carry a cogeneration alternative forward for more detailed review.

Cogeneration produces electricity from waste heat. Multiple biomass generators in Shasta County use cogeneration technology, including three facilities in Anderson and two in Burney.[9] These facilities range in power output from Shasta Renewable Resources LLC's 6 MW wood-fired cogeneration plant to Wheelabrator's 55 MW wood-fired power plant. Although cogeneration capability "does not allow these firms to be energy self-sufficient, the systems can generate enough energy to supply a major portion of plant needs during peak demand periods" (Shasta County, 2004a). As explained in General Plan Section 6.4, Energy (Shasta County, 2004a), the County encourages the development of cogeneration sources. Recent efforts have been made to expand the amount of cogeneration capacity available in the region. The Sierra Institute for Community and Environment conducted a Biomass Cogeneration Facility Location Assessment for Fall River Resource Conservation District and The State Wood Energy Team in 2014 (Sierra Institute, 2014). Noting an overabundance of biomass in the Shasta-Trinity and Lassen National Forests and on private ownerships in the region, the Sierra Institute evaluated potential sites for a new combined heat and power facility of up to 3 MW in the Burney-Hat Creek area. Two sites were identified as promising: The Covanta combined heat and power facility in Burney and the Hat Creek Construction Company land located 4 miles north of the SR 299/89 junction.[10]

[9] The Anderson facilities include Wheelabrator's 55 MW wood-fired power plant (Wheelabrator Technologies, 2019), Sierra Pacific Industries' 31 MW cogeneration power facility (County Use Permit 07-021), and Shasta Renewable Resources LLC's 6 MW wood-fired cogeneration plant (Central Valley RWQCB, 2016). The Burney facilities include Burney Forest Power's 31 MW biomass-fueled power plant (Bloomberg, 2019; Energy Justice Network, 2019) and a Sierra Pacific facility.

[10] A facility on the Hat Creek Construction Company land has received permit approval, but as of June 2020 has not moved forward to construction.

A cogeneration alternative to the Project was not carried forward for more detailed consideration because it would not result in a commercial wind energy generation facility capable of generating up to 216 MW of wind energy and would not provide emissions-free energy for approximately 86,000 households, since there is no basis to assume that the energy it would generate would even offset the power required to operate the associated biomass facility much less contribute to other PG&E ratepayers.

Solar

Members of the public suggested during the scoping process that the County consider a solar power alternative to the Project. A potential solar energy alternative to the Project was not carried forward primarily because it would not meet most of the basic objectives of the Project. A solar project alternative would not result in the development, construction, and operation of a commercial wind energy generation facility capable of generating up to 216 MW of wind energy and, based on geographic considerations, would not reasonably be expected to offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels or provide emissions-free energy for approximately 86,000 households.

A successful solar project would require an appropriate site. It does not appear that the Project Site would be appropriate for a utility scale solar project of a size that could functionally replace the Project based on a variety of factors, including low solar resource (NREL, 2017) further constrained by shading from trees and ridges, local climate, and topography. Research published by the World Bank Group's International Finance Corporation (IFC, 2015) describes the avoidance of shading for a solar project site as "critical" because even small areas of shade, e.g., from trees or overhead cabling, "may significantly impair the output of a module or string of modules." The Project Site is surrounded by timberlands, crossed by power lines, and shadowed by ridges. The Project Site climate also is not particularly conducive to a successful utility scale solar project. IFC (2015) identifies high wind speeds and snow as among the weather events that could adversely affect site suitability: "Locations with a high risk of damaging wind speeds should be avoided. Fixed systems do not shut down at high wind speeds, but tracking systems must shut down when high wind speeds are experienced." Further, "a site that that has regular coverings of snow for a long period of time may not be suitable for developing a solar PV power plant" (IFC, 2015). The Project Site is subject to high winds, and regular heavy snows. Project Site topography also is not conducive to solar development, which "[i]deally… should be flat or on a slight south-facing slope" (IFC, 2015). Elevations within the Project area range from about 3,000 to 6,600 feet, and the Project Site includes steep ridges rather than slight slopes. The County's initial assessment that a solar development would not be a reasonable or feasible alternative to the Project is underscored by the market: In 2018, of the 45 California counties where solar power plants had been installed, Shasta ranked 30th with a total of 8 MW (CEC, 2019d).

2.5.2.4 Alternative Approaches

Conservation and Demand-side Management

Members of the public suggested during the scoping process that the County consider conservation and demand-side management as an alternative to the Project. Conservation and demand side management consists of a variety of approaches to reduce electricity use and shift electrical demand to times of the day when energy demand is lower. It includes increased energy efficiency and conservation, building and appliance standards, fuel substitution, and load management. Implementation of conservation and demand side management techniques could result in a reduction in demand, thus reducing the need for new generation, and thereby serve the region's growing demand for power. Conservation and demand-side management was not carried forward for more detailed consideration because it would not meet most of the basic objectives of the Project and would be speculative as well as infeasible from a technical perspective.

Increased energy efficiencies and reductions in energy demand would not meet Project objectives. They would not result in the development, construction, and operation of a commercially financeable wind energy generation facility capable of generating up to 216 MW of wind energy for interconnection to the Northern California electrical grid, would not directly assist California in meeting the renewable energy generation targets set in SB 100, would neither create temporary and permanent jobs in the County nor contribute to the County's tax base, and would not support landowners through diversification of revenue streams.

This potential alternative also was not carried forward because reliance on conservation and demand side management alone would be speculative and a technically infeasible alternative to the Project. The State's long-term Energy Efficiency Strategic Plan, as adopted by the California Public Utilities Commission (CPUC), provides an integrated framework of goals and strategies for saving energy through 2020 (CPUC, 2008; CPUC, 2011). The plan champions specific programmatic initiatives for key market sectors (i.e., commercial, residential, industrial, and agricultural) and a series of "big bold energy efficiency strategies" including all new residential construction being zero net energy by 2020 and all new commercial construction being zero net energy by 2030. Given the aggressiveness of these goals, it would be speculative to assume that incremental savings beyond them could be achieved. While energy efficiency efforts have been effective and will continue to be part of California's overall energy future, conservation and demand-side management alone will not be sufficient to address California's rising energy demand.

Other Distributed Energy Resources

In addition to energy efficiency and demand response, the range of distributed energy resources includes energy storage and "behind the meter" options such as customer generation (e.g., rooftop solar) and alternative fuel vehicles (e.g., electric vehicles). There is some indication that distributed energy use is on the rise. According to the 2019 California Green Innovation Index (Next10, 2019), the number of rebates rose dramatically from 2017 to 2018 for both plug-in hybrid electric vehicles (up 39 percent) and battery electric vehicles (up 67 percent). Behind-the-meter energy storage also has been on the rise; however, the CPUC reported in 2018 that this type of storage has not had the intended benefits in achieving greenhouse gas (GHG) emissions reductions (and in fact actually has increased GHG emissions) because charging has not occurred at times when there is excess renewable energy on the grid (CPUC, 2018b). The fact that distributed energy resources may have a growing role in California's energy future does not mean that it is a viable alternative to the Project.

Other Distributed Energy Resources was not carried forward for more detailed consideration because it would not meet most of the basic objectives of the Project. It would not result in the development, construction, and operation of a commercially financeable wind energy generation facility capable of generating up to 216 MW of wind energy for interconnection to the Northern California electrical grid, and would not support landowners through diversification of revenue streams.

Improving the Efficiency of Existing Energy Infrastructure

Members of the public suggested during the scoping process that the County consider improving the efficiency of existing energy infrastructure for the delivery and storage of excess power already generated in California as an alternative to the Project. Separate from and independent of this applicant's proposed development of this Project, the California Independent System Operator (CAISO) has identified 12 transmission projects in PG&E's service territory that are needed to maintain transmission system reliability, including a dynamic voltage support project at Round Mountain (Rivera-Linares, 2019). The Round Mountain 500 kV Dynamic Voltage Support project is expected to be in service in 2024. These efficiency and reliability projects would be considered with or without the Project, and are not a viable alternative to it.

Existing Infrastructure Efficiency Improvements was not carried forward for more detailed consideration because this potential alternative would not meet most of the basic objectives of the Project. It would not result in the development, construction, and operation of a commercially financeable wind energy generation facility capable of generating up to 216 MW of wind energy for interconnection to the Northern California electrical grid, would not assist California in meeting the renewable energy generation targets, and would not support landowners through diversification of revenue streams. The approval of such improvements also is likely to be subject to the CPUC's authority, and not the County's.

2.5.3 Alternatives Evaluated in Detail in this EIR

2.5.3.1 No Project Alternative

CEQA Guidelines Section 15126.6(e) requires consideration of a No Project Alternative. Under the No Project Alternative, Use Permit No. UP 16-007 would not be issued and the Project would not be built. None of the proposed wind turbines and associated transformers, associated infrastructure, or ancillary facilities would be constructed, operated and maintained, or decommissioned on the Project Site. FAA-required safety lighting would not be installed. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the onsite collector substation, switching station, and operation and maintenance (O&M) facility would not be constructed. Foundations would not be excavated, laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved. No groundwater well, water storage tank, or septic system would be installed onsite, and no construction-related or other refuse would be removed from the site. No electric power would be needed at the Project Site, or delivered to the regional grid from the Project Site. Existing stormwater drainage patterns on the site would not be affected. No materials delivery-related or other construction trucks, equipment, or additional vehicle trips would be made to, from, or within the site relative to baseline conditions. None of the proposed construction workers and none of the full-time employees would travel to or be employed on the Project Site; decommissioning and site restoration phase workers similarly would not be present.

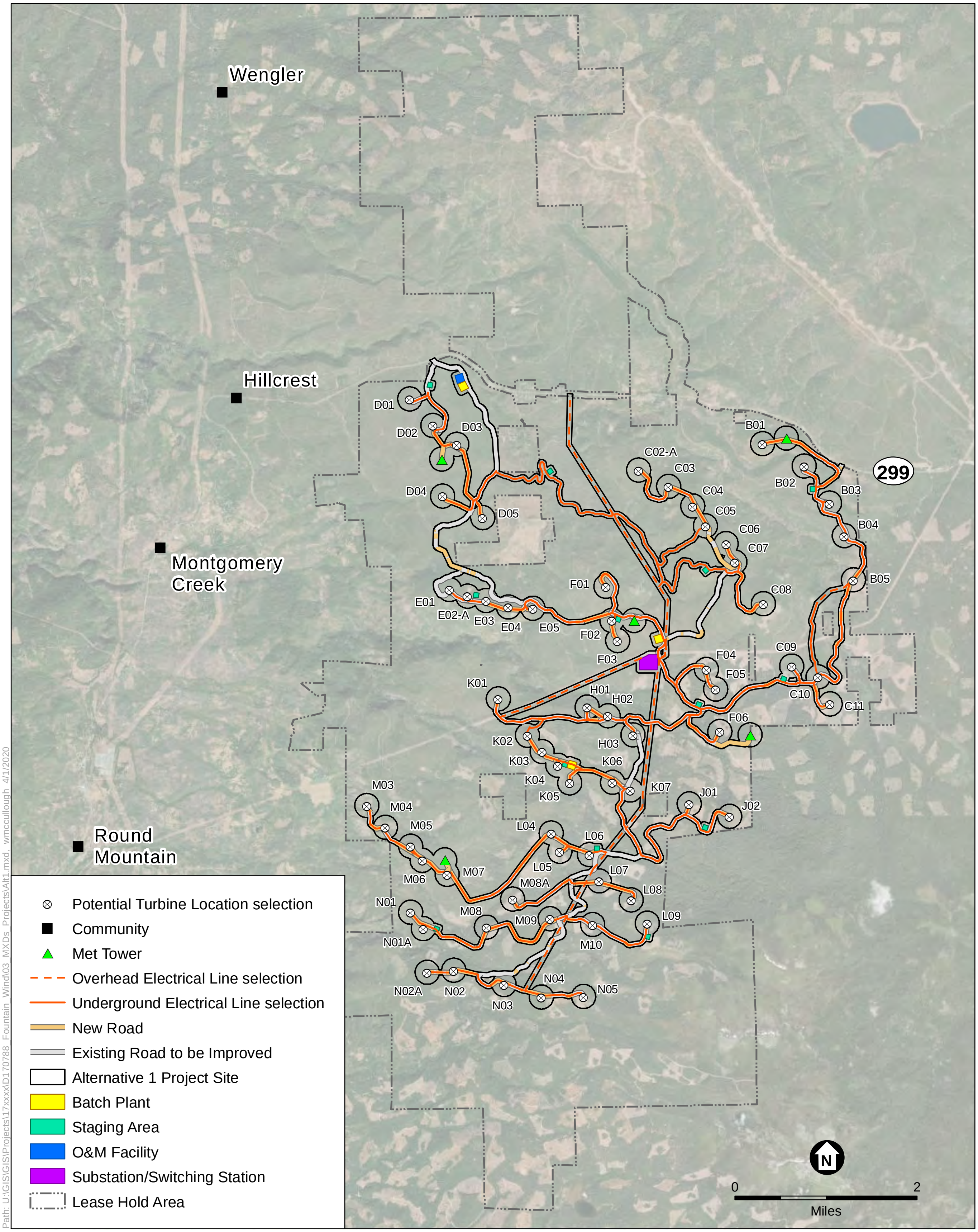
Instead, it is assumed that the land within the Project boundary would continue to be managed for timber production. The analysis of the No Project Alternative projects the environmental consequences of what reasonably would be expected to occur in the foreseeable future if the Project were not approved, based on the site's current General Plan designation as Timber (T), and its zoning designations of Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). The same environmental benefits and impacts currently occurring would continue to occur. On the potential benefits side, for example, Section 6.2 of the Shasta County General Plan explains that "land dedicated to commercial forest management provides not only building materials, energy for industrial processes, firewood, County revenue for roads and schools, and employment opportunities, but also wildlife habitat, recreational opportunities, aesthetic enjoyment, and watershed." By contrast, the General Plan discussion continues, "Negative impacts from forest practices may affect surrounding land uses and resources and create special management problems for timberland operations. Harvesting practices and the associated noise, dust, and traffic can be potentially damaging to air and water resources, wildlife habitats, aesthetic enjoyment, and the health and safety of nearby residences, although state-required timber harvest plans are intended to mitigate timber harvesting impacts to acceptable levels. These problems can be magnified if incompatible land uses locate too close to one another." (Shasta County, 2004b).

In sum, the No Project Alternative would avoid all Project-related impacts but would cause impacts on the physical environment resulting from continued timber operations. No legal, regulatory, or technical feasibility issues were identified that would eliminate the No Project Alternative from consideration. However, the No Project Alternative would not meet any of the Project objectives.

2.5.3.2 Alternative 1: South of SR 299

Under Alternative 1, the South of SR 299 Alternative, the Project would be constructed, operated and maintained, and ultimately decommissioned as proposed south of SR 299, and none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. The Alternative 1 Site would consist of the approximately 4,086 acres located south of SR 299, while the approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production. See **Figure 2-6**, *Alternative 1*. Each of Alternative 1's up to 65 turbines could be up to 679 feet tall, as measured from ground level to vertical blade tip (total tip height) (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Overall, Alternative 1 would have a total nameplate generating capacity of up to 195 MW and could provide emissions-free energy for approximately 9,880 fewer households relative to the Project (i.e., 91,746 households for Alternative 1 relative to the Project's 101,627 households).

The components and disturbance areas for Alternative 1 are summarized in **Table 2-6**, *Alternative 1 Components and Disturbance Areas*. For purposes of analysis, it is assumed that water, wastewater, and hazardous materials-related requirements would be substantially the same as for the Project; and that the number of workers and durations of construction, operation and maintenance, and decommissioning and site restoration also would be substantially the same as for the Project.



Fountain Wind Project

Figure 2-6
Alternative 1

ESA

TABLE 2-6
ALTERNATIVE 1 COMPONENTS AND DISTURBANCE AREAS

Project Component	Quantity	Area of Temporary Disturbance	Area of Permanent Disturbance
Turbines and pads (including temporary turbine construction areas)	Up to 65	5 acres per turbine (up to 325 total acres)	2.5 acres per turbine (up to 162.5 total acres)[a]
Underground electrical collector system[b]	Up to 48.9 miles	50-foot-wide corridor, up to a total of 297 acres	30-foot-wide corridor cleared of large vegetation, up to a total of 178 acres
Overhead electrical collector line and associated roads, work footprint, and permanent 2-track access road[c]	Up to 9.8 miles	100-foot-wide corridor, up to a total of 119 acres	80-foot-wide right of way cleared of large vegetation, up to a total of 95 acres
Onsite collector substation	1	8 acres	5 acres
Onsite switching station (including interconnection equipment)	1	11 acres	8 acres
Access roads (including crane roads)	Up to 22.2 miles of new roads	80-foot-wide disturbance area, up to a total of 215 acres. Nominally up to 200 foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	20-foot-wide drivable surface with a 1-foot shoulder on both sides and up to an additional 10 feet on either side where required for storm water drainage design, up to a total of 113 acres. Permanent disturbance width nominally up to 200 feet.
Widen existing access roads	Up to 28.9 miles of existing roads may be widened	80-foot-wide disturbance area, up to 224 acres of new disturbance. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	Permanently widen to 20 feet with up to 10 feet on either side where required for storm water drainage design, up to 84 acres. Permanent disturbance width nominally up to 200 feet in some locations.
O&M facility	1	5 acres	5 acres (including a 5,460-square foot O&M building and two 0.5-acre Operations storage sheds)
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0 acres
Temporary laydown areas	13	2 acres per laydown area (26 acres total)	0 acres
Temporary batch plant, if necessary	3	3 to 5 acres per batch plant (up to 15 acres total)	0 acres
MET Towers	4	1 acre per structure (4 acres total)	0.5 acre per structure (2 acres total)
Anticipated Total Temporary Construction Disturbance[d]: 1,259 acres (a reduction of 125 acres relative to the Project)			
Anticipated Total Permanent Disturbance: 652.5 acres (a reduction of 60.5 acres relative to the Project)			

NOTES:
a Includes defensible fire space around each turbine
b Portions of the underground collector system would be located within the access road construction buffer in order to minimize impacts. No additional permanent impacts would occur in these areas. This acreage includes the co-located overhead communications system.
c Acreage includes co-located underground communications system. An 80-foot-wide corridor centered on the transmission line is assumed for disturbance calculations.
d Timber harvested and timberland to be coverted is included within the anticipated disturbance areas.

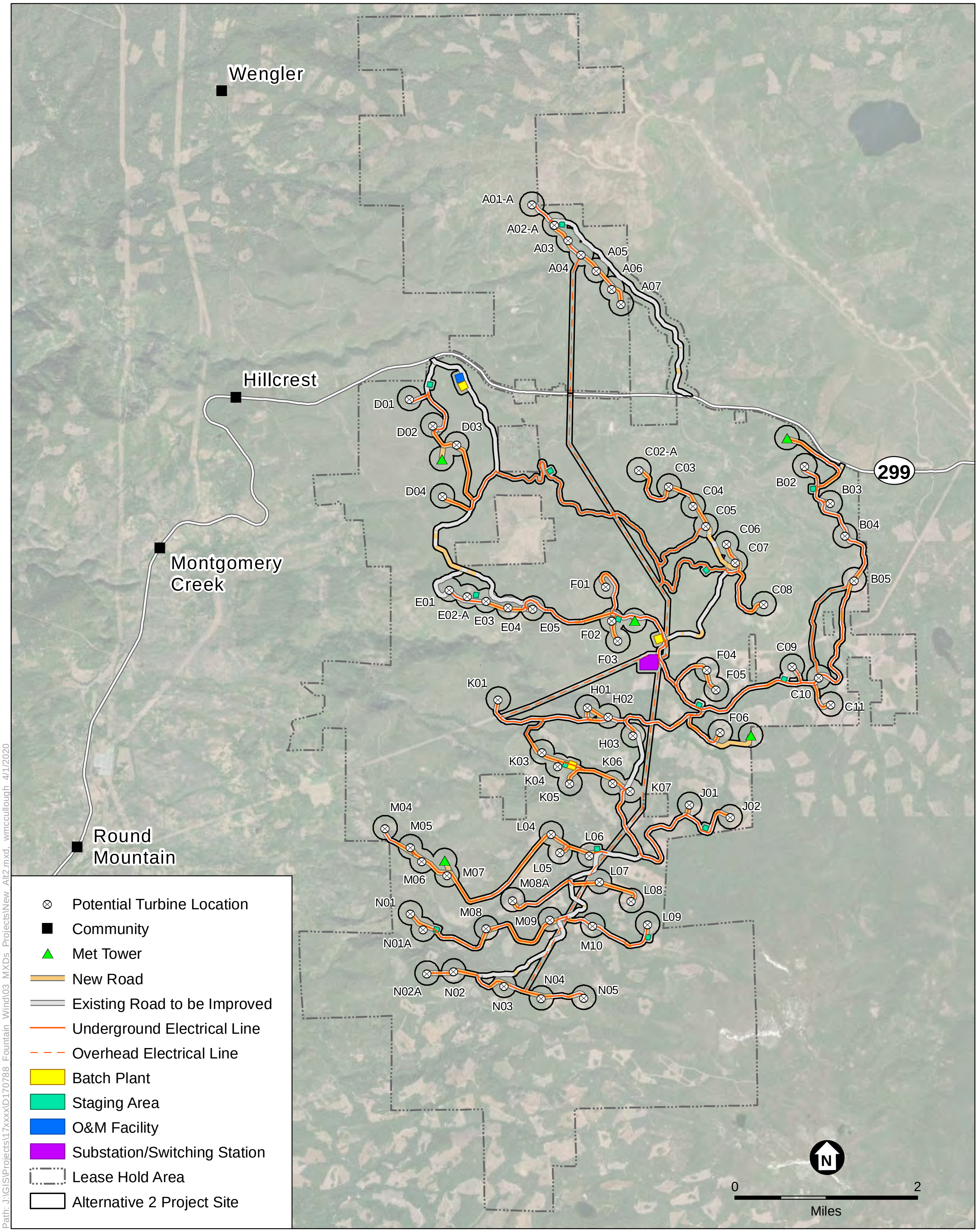
SOURCES: Table 2-1, as modified in accordance with assumptions described for Alternative 1.

Scoping comments suggested that the County consider a reduced-project alternative (i.e., one with fewer turbines and/or a more concentrated placement of turbines) and a modified project alternative that would relocate the proposed turbines to the south relative to the existing proposal. Alternative 1 responds to these suggestions. Relative to the screening criteria outlined in Section 2.5.1, the County preliminarily has determined that Alternative 1 may be feasible even if it would impede to some degree the attainment of the Project objectives relating to generating capacity, carbon dioxide emissions offset, and the number of households that could be served with clean energy if the Project were approved. Alternative 1 has been designed to avoid all Project impacts north of SR 299 and to lessen any significant effects of the Project to aesthetics, avian and other wildlife species and to Tribal Cultural Resources, including to birds traditionally important to the Pit River culture (e.g., eagles, eagle nests, and osprey) and audible and physical disruption of an area identified by Native Americans as culturally significant.

2.5.3.3 Alternative 2: Increased Setbacks

Under Alternative 2, the locations of four individual turbines would not be constructed due to their proximity to residential property and public roadways. The proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, Supan Road, Terry Mill Road, or any other publicly maintained public highway or street. These setback distances would be among the largest in the State based on a comparison of setback requirements included in county ordinances in California for large wind projects as compiled by WINDExchange, a resource of the Wind Energy Technologies Office of the U.S. Department of Energy (DOE, 2020). Implementation of these setbacks would remove proposed turbines M03, D05, and B01 based on the residential property line setback, and would remove turbine K02 based on the roadway setback. Related infrastructure and work areas for these turbines (including temporary turbine construction areas, access roads and crane roads) would not be needed. The remaining turbines, infrastructure and other improvements would be the same as proposed for the Project. **Figure 2-7**, *Alternative 2*. The components and disturbance areas for Alternative 2 are summarized in **Table 2-7**, *Alternative 2 Components and Disturbance Areas*. Each of Alternative 2's up to 68 turbines could be up to 679 feet tall, as measured from ground level to vertical blade tip (total tip height) (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Overall, Alternative 2 would have a total nameplate generating capacity of up to 204 MW and could provide emissions-free energy for approximately 5,646 fewer households relative to the Project (i.e., 95,981 households for Alternative 2 relative to the Project's 101,627 households).

Scoping comments suggested that the County consider a project alternative that would move turbines further away from Moose Camp, and expressed concerns about noise, vibration, and safety. Alternative 2 has been designed to respond to these suggestions. Relative to the screening criteria outlined in Section 2.5.1, the County preliminarily has determined that Alternative 2 may be feasible even if it would impede to some degree the attainment of the Project objectives relating to generating capacity, carbon dioxide emissions offset, and the number of households that could be served with clean energy if the Project were approved.



Fountain Wind Project

Figure 2-7
Alternative 2

ESA

TABLE 2-7
ALTERNATIVE 2 COMPONENTS AND DISTURBANCE AREAS

Project Component	Quantity	Area of Temporary Disturbance	Area of Permanent Disturbance
Turbines and pads (including temporary turbine construction areas)	Up to 68	5 acres per turbine (up to 340 total acres)	2.5 acres per turbine (up to 170 total acres)[a]
Underground electrical collector system[b]	Up to 48.9 miles	50-foot-wide corridor, up to a total of 297 acres	30-foot-wide corridor cleared of large vegetation, up to a total of 178 acres
Overhead electrical collector line and associated roads, work footprint, and permanent 2-track access road[c]	Up to 9.8 miles	100-foot-wide corridor, up to a total of 119 acres	80-foot-wide right of way cleared of large vegetation, up to a total of 95 acres
Onsite collector substation	1	8 acres	5 acres
Onsite switching station (including interconnection equipment)	1	11 acres	8 acres
Access roads (including crane roads)	Up to 23 miles of new roads	80-foot-wide disturbance area, up to a total of 223 acres. Nominally up to 200 foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	20-foot-wide drivable surface with a 1-foot shoulder on both sides and up to an additional 10 feet on either side where required for storm water drainage design, up to a total of 117 acres. Permanent disturbance width nominally up to 200 feet.
Widen existing access roads	Up to 28.9 miles of existing roads may be widened	80-foot-wide disturbance area, up to 224 acres of new disturbance. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	Permanently widen to 20 feet with up to 10 feet on either side where required for storm water drainage design, up to 84 acres. Permanent disturbance width nominally up to 200 feet in some locations.
O&M facility	1	5 acres	5 acres (including a 5,460-square foot O&M building and two 0.5-acre Operations storage sheds)
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0 acres
Temporary laydown areas	13	2 acres per laydown area (26 acres total)	0 acres
Temporary batch plant, if necessary	3	3 to 5 acres per batch plant (up to 15 acres total)	0 acres
MET Towers	4	1 acre per structure (4 acres total)	0.5 acre per structure (2 acres total)
Anticipated Total Temporary Construction Disturbance[d] 1,282 acres: (a reduction of 102 acres relative to the Project)			
Anticipated Total Permanent Disturbance 664 acres: (a reduction of 49 acres relative to the Project)			

NOTES:
[a] Includes defensible fire space around each turbine
[b] Portions of the underground collector system would be located within the access road construction buffer in order to minimize impacts. No additional permanent impacts would occur in these areas. This acreage includes the co-located overhead communications system.
[c] Acreage includes co-located underground communications system. An 80-foot-wide corridor centered on the transmission line is assumed for disturbance calculations.
[d] Timber harvested and timberland to be coverted is included within the anticipated disturbance areas.

SOURCES: Table 2-1, as modified in accordance with assumptions described for Alternative 1.

2.6 Permits and Approvals

Permits and approvals that could be required for site preparation, construction, operation, maintenance, and decommissioning of the Project are summarized in **Table 2-8**, *Summary of Permits and Approvals*.

TABLE 2-8
SUMMARY OF PERMITS AND APPROVALS

Agency	Permit/Approval
Federal	
Federal Aviation Administration (FAA)	Notice of Proposed Construction or Alteration; Determination of No Hazard.*
U.S. Army Corps of Engineers (USACE)	Clean Water Act, Section 404 Nationwide Permit if jurisdictional waters of the U.S. could be affected by construction or operation of the Project.
U.S. Fish and Wildlife Service (USFWS)	Section 7 or Section 10 permits may be required if project results in take of a species listed under the federal Endangered Species Act (FESA).
State	
California Department of Forestry & Fire Protection (CAL FIRE)	Application for timberland conversion (Pub. Res. Code §4621 et seq.); approval of a timber harvesting plan (Pub. Res. Code §4582).
State Water Resources Control Board and/or Regional Water Quality Control Board (SWRCB and/or RWQCB)	Construction Stormwater General Permit; Notice of Intent to Comply with Section 402 of the Clean Water Act, SWPPP and SPCC Plan; Industrial Stormwater General Permit; Approval of O&M SWPPP and SPCC Plan. Section 401 certification if USACE determines jurisdictional waters of the U.S. would require a Clean Water Act Section 404 permit.
California Department of Fish and Wildlife (CDFW)	Streambed Alteration Agreement (Fish & Game Code §1600 et seq.); permit authorization if "take" of endangered, threatened, or candidate species could result incidental to an otherwise lawful activity (Fish & Game Code §2081).
California Department of Transportation	Oversize load permit(s) and variances for loads with a width over 15 feet and/or length over 135 feet. Encroachment Permit for utility line crossing state right-of-way.*
California Highway Patrol	Notification of Transportation of Oversize/Overweight Loads.*
California Public Utilities Commission	Approval of construction of switching station for transfer to PG&E (i.e., General Order 131-D).
Local	
Shasta County Air Quality Management District	Authority to Construct and/or Permit to Operate as needed.
Shasta County	Use Permit.
Shasta County Department of Resource Management, Environmental Health Division	Hazardous Materials Business Plan, septic system permit, well permit.*
Shasta County Building Division	Building and grading permits.*
Shasta County Hazardous Materials Program, CUPA	Hazardous Materials Business Plan and Permit for handling hazardous materials above threshold quantities (includes hazardous waste management).*
Shasta County, Public Works Department	Encroachment Permit.*

NOTE: * Typically processed as ministerial permits

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