Shasta County Department of Resource Management – Planning Division

Use Permit 16-007 - Application

Fountain Wind Project

Shasta County, CA

Applicant:

Pacific Wind Development, LLC
1125 NW Couch St., Suite 700
Portland, OR 97209

Prepared by:

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PROJECT SUMMARY

Project Name:	**Fountain Wind Project**
Applicant:	Pacific Wind Development, LLC 1125 NW Couch St., Suite 700 Portland, OR 97209 Contact: Kristen Goland Telephone: (503) 478-6360
Location of Proposed Action:	Shasta County, CA
Land Ownership:	Oxbow Timber I, LLC
Assessor Parcels:	021-220-009, 021-220-010, 021-230-012, 021-230-013, 021-230-028, 021-230-030, 021-250-005, 021-250-008, 021-290-001, 021-290-002, 021-290-010, 022-110-002, 022-110-003, 022-110-006, 022-110-007, 022-110-008, 022-110-011, 022-130-001, 022-130-003, 022-130-004, 022-130-005, 022-130-006, 022-130-007, 022-130-008, 022-130-009, 022-130-010, 022-130-020, 022-130-023, 027-110-013, 027-110-020, 027-120-001, 027-120-002, 027-120-009, 027-130-009, 027-140-001, 027-140-002, 027-140-004, 027-140-015, 027-140-022, 027-140-027, 027-140-028, 027-160-020, 027-160-027, 027-160-034, 027-160-042, 027-160-047, 027-160-048, 027-160-049, 027-210-006, 027-220-001, 027-220-013, 029-170-005, 029-170-006, 029-170-007, 029-170-008, 029-170-017, 029-190-010 through 029-190-014, 029-190-016, 029-190-017, 029-200-041 through 029-200-043, 029-210-001, 029-210-009, 029-210-019, 029-210-020, 029-210-021, 029-210-033, 029-220-005, 029-220-006, 029-220-012, 029-250-001, 029-250-005, 029-250-006, 029-250-007, 029-250-010, 029-310-005 to 029-310-007, 029-310-010, 029-310-012, 030-080-005 to 030-080-008, 030-080-013, 030-080-014, 034-010-003, 034-010-017, 098-270-001
Total Parcel Area:	37,436 acres
Project Size:	Permanent Disturbance Area – approx. 972 acres Temporary Disturbance Area – approx. 2,167 acres
Zoning Designations:	Timber Production (TP) Unclassified (U)
Existing Use:	Private timberland
Proposed Action:	Pacific Wind Development, LLC (PWD) proposes to construct and operate the Fountain Wind Project (Project) which would consist of up to 100 wind turbines and associated infrastructures, with a nameplate generating capacity of up to approximately 347 megawatts (MW). The proposed Project would be located on 94 assessor parcels. Pursuant to Shasta County Code (SCC) Section 17.92.020, a Use Permit application is being submitted for the proposed Project. In addition to the wind turbines including associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components.

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WRITTEN STATEMENT

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Acronyms and Abbreviations

Applicant	Pacific Wind Development, LLC
BMP	best management practices
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CWA	Clean Water Act
dBA	A-weighted decibels
ECPG	Eagle Conservation Plan Guidance
FAA	Federal Aviation Administration
FPP	Fire Protection Plan
HMBP	Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan
kV	Kilovolt
LOS	Level of Service
MET	Meteorological
MW	Megawatts
NOI	Notice of Intent
NPHA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
NWI	National Wetlands Inventory
O&M	Operations and Maintenance
PG&E	Pacific Gas and Electric Company
Phase I ESA	Phase I Environmental Site Assessment
Project	Fountain Wind Project
PWD	Pacific Wind Development, LLC
SCADA	Supervisory Control and Data Acquisition
SCC	Shasta County Code
SCS	Site Characterization Study

SWPPP	Storm Water Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TP	Timber Production
U	Unclassified
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEG	Land-Based Wind Energy Guidelines

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1.0 Introduction

This major Use Permit (16-007) application is for the Fountain Wind Project (Project), a renewable wind energy generation development to be constructed and operated in eastern Shasta County, California, by Pacific Wind Development, LLC (PWD or Applicant), a subsidiary of Avangrid Renewables, LLC. The Project would consist of wind turbines and associated infrastructure, with a nameplate generating capacity of up to approximately 347 megawatts (MW).[1] The Project would be located west of the existing Hatchet Ridge Wind Farm, approximately 6 miles west of Burney, 35 miles northeast of Redding, and immediately north and south of State Route 299 (Figure 1). It would be constructed within an area of approximately 37,436 acres of private land, distributed over 94 tax assessor parcels, owned by Oxbow Timber I, LLC.

The lands underlying the Project are designated as Timber Production (TP) and Unclassified (U) under the Shasta County Zoning Plan. Shasta County Code (SCC) Section 17.08.030(D) pertains to the TP district and conditionally allows the construction of "gas, electrical, water, or communication transmission facility, or other public improvements, in accordance with Government Code Section 51152." Per SCC Section 17.64.040, wind energy system are conditionally permitted in the U district as long as it is not otherwise prohibited by law and not inconsistent with any portion of the General Plan[2]. Per SCC Section 17.88.035, a Use Permit is required in all districts for wind energy systems which do not meet the definition of "small wind energy system," defined as being greater than 50 kilowatts in size. Therefore, this Use Permit application has been prepared pursuant to SCC Section 17.92.020, which are the rules governing Use Permits. Consistency with the General Plan is further discussed in Section 4.10 of this Use Permit application.

The Project would consist of up to 100 turbines, each having a generating capacity of 2 to 4 MW. The Project would also include ancillary facilities such as construction laydown areas, temporary batch plant(s) - if needed, access roads, underground and overhead collector lines, an operations and maintenance (O&M) facility, storage sheds, and substation components. The Project layout presented in Figure 2 represents proposed locations of Project infrastructure based on information available at the time of the preparation of this Use Permit application. PWD is currently conducting a number of environmental studies to collect additional site condition information (see Section 5.0 for a description of ongoing and anticipated studies). Information gained from these studies will be used to further refine the Project layout, as appropriate, to avoid and minimize environmental impacts.

[1] The nameplate generating capacity for a wind energy generation project is the sum of the total capacity rating of the turbines and should be considered a project's total potential generation output. A project's capacity factor refers to the percentage of the nameplate capacity actually generated over time.

[2] The Project is consistent with General Plan as the U district lands underlying the Project are timberlands outside of the Timber Protection Zone and as such, power generation facilities are an allowed use per General Plan Policy 6.2.4, T-d.

2.0 Project Description

2.1 Description of Project Location and Existing Site Conditions

PWD has a long term lease of approximately 37,436 acres with Oxbow Timber I, LLC for construction and operation of the Project. This leased area is hereafter referred to as the **Project area**. However, all proposed Project activities would occur within the **Project site**, a smaller area which is currently being studied. The Project site constitutes survey corridors for the Project within which all ground-disturbing activities, both permanent and temporary, would occur and which would be occupied by permanent Project facilities.

The Project area is located in the southern end of the Cascade Range and is within the Cascades Ecological Region (USEPA 2013), which is a Level III ecoregion primarily covering parts of Oregon and Washington but also including a discontinuous land area near Mt. Shasta in California. This ecoregion is characterized by underlying volcanic rock strata and a physiography defined by recurring periods of glaciation. With high plateaus and valleys that trend east-west, this ecoregion includes steep ridges as well as both active and dormant volcanoes, and is marked by a generally mesic, temperate climate which supports productive coniferous forests. At higher elevations, subalpine meadows may occur that support unique flora and fauna. The Project area is characterized by a number of buttes and peaks separated by small valleys formed by a number of tributaries in the Pit River and Cow Creek Watersheds. Significant waterways within the Project area include the north and south forks of Montgomery Creek and Little Cow Creek. Elevations within the Project area range from approximately 1,040 to 2,020 feet.

Land ownership within the Project area is exclusively private, consisting of managed forest timberlands. An approximately 64,000-acre (100 square miles) burn scar from the Fountain Fire, which impacted the area in 1992, coincides with northern portions of the Project area. The Lassen National Forest lies adjacent to the southeast; other surrounding lands are privately owned. Communities in the vicinity of the Project include Burney, Moose Camp, Hillcrest, Wengler, Montgomery Creek, and Round Mountain. California State Route 299 bisects the Project area with the majority of the Project area (23,791 acres) located south of the highway. The Project area is accessible via several existing named and unnamed private roads extending from State Route 299 (Figure 2).

2.2 Project Overview

This section provides an overview of each of the Project facilities. These include:

- Up to 100 turbines erected on tubular steel towers set on concrete foundations, with associated turbine pads, laydown areas, and potentially (based on turbine model) pad mounted transformers;
- A 34.5-kilovolt (kV) overhead and underground electrical collector system linking each turbine to the next and to the onsite collector substation;

- A overhead and underground communication system (fiber optic cabling) adjacent to the electrical collector system;
- An onsite collector substation and switching station for connecting the Project to the existing Pacific Gas and Electric Company (PG&E) transmission line;
- Access roads, consisting of existing and new roads;
- A temporary, 10-acre construction and equipment laydown area, construction trailer area, and associated parking area;
- Seventeen temporary, 2-acre laydown areas distributed throughout the Project site;
- An O&M facility including an operations building and outdoor storage area;
- Permanent meteorological (MET) towers and one Sonic Detection and Ranging unit or one Light Detection and Ranging unit;
- Storage sheds; and
- Temporary batch plant(s) - if needed.

Typical dimensions and disturbance areas for each Project component are provided in Table 2-1. The proposed Project layout is shown in Figure 2.

Table 2-1. Project Facilities and Disturbance Areas

Project Component	Quantity	Typical Area of Construction Soil Disturbance (Total)	Typical Area of Permanent Disturbance (Fill/Structures/Grading)[1]
Turbines and pads (incl. construction laydown areas)	Up to 100	5 acres per turbine	2.5 acres per turbine [2]
Underground electrical collector system [3]	Up to 56 miles	50-foot-wide per linear foot	30-foot-wide corridor maintained clear of large vegetation where it deviates from paralleling access roads
Overhead electrical collector line (including roads for construction, pull points, and pole construction) and 2-track road to access during operations [4]	Up to 16 miles	100-foot-wide per linear foot	50-foot-wide right-of-way per linear foot cleared of large vegetation
Onsite collector substation and switching station	1	25 acres	collector substation – 5 acres switching substation – 15 acres
Access roads (includes crane roads)[5]	Up to 21 miles of new roads Current layout shows 87 miles of existing roads that may potentially be used	40.0-foot-wide per linear foot drivable surface and nominally 80.0-foot-wide for construction clear area	20-foot-wide per linear foot with a 1 foot shoulder on both sides and nominally up to an additional 6-feet on either side where required for storm water drainage design
O&M facility	1	5 acres	5 acres, with 5,460-square foot O&M Building
Operations storage sheds	2	NA (located in temporary laydown areas)	0.5 acres
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0.0 acres
Temporary laydown areas	17	2 acres per laydown area	0.0 acres
Temporary batch plant, if necessary	2	3 to 5 acres	0.0 acres
MET towers	2	1 acre per structure	0.1 acres
Anticipated Total Construction Disturbance 2,167 acres			
Anticipated Total Permanent Disturbance 972 acres			

1. Permanent impact acreages are a subset of total impacts.
2. Includes defensible fire space around each turbine.
3. Portions of the electrical collector system would be within the access road construction buffer; no additional permanent impacts would occur in these areas. Note that acreage includes co-located underground communications system (cabling)
4. For impact calculations assumed a 7-foot-wide corridor centered on the transmission line; actual impacts would be less and limited to pole and pull site locations. Note that acreage includes co-located overhead communications system (cabling)
5. Acreage includes both existing and new road segments.

2.2.1 Wind Turbines

PWD is currently considering a range of turbine models from leading manufacturers, ranging in generating capacity and dimensions, to meet the desired approximately 347 MW nameplate generating capacity of the Project. The final turbine model and specific number of turbines will be selected based on availability at time of construction, conformance with PG&E grid requirements, onsite wind resources, and other Project-specific factors.

The turbines would be three-bladed, horizontal-axis models, meaning that the rotor shaft and nacelle, which houses the electrical generator, are mounted at the top of a tubular tower and must be pointed into the wind. Turbine towers would be mounted on a concrete pedestal supported by a permanent concrete foundation. Turbine models being considered range in height; however, none will exceed a maximum height at the top of the blade of 591 feet above ground level. Turbine dimensions representative of models under consideration are shown in Figure 3. Each turbine will require a step-up transformer which would either be housed within the turbine nacelle or approximately 5 feet from the tower foundation on a reinforced concrete box pad approximately 9 by 9 feet.

A Federal Aviation Administration (FAA) approved lighting plan would be developed for the Project. This plan would specify the installation of flashing red lights on designated turbines and met towers to improve nighttime visibility for aviation.

A temporary construction work area, or turbine pad, would be cleared and graded for each turbine. Work areas vary in size, and would be constructed differently in keeping with each turbine site's topography. A typical turbine pad is shown in Figure 4. Although turbine pad size and configuration would vary depending on terrain, each turbine pad would require an approximately 200-foot by 250-foot area that is cleared and leveled to approximately 2 percent slope or less. The cleared area is necessary for foundation excavation and construction, assembling the turbine, and also to stage the construction crane which would hoist turbine sections into place. Additional area would be needed for rotor assembly depended upon site conditions and installation. The turbine construction area would not be paved. A compacted-soil crane pad would be located within the 200-foot by 250-foot turbine pad area; however, the actual crane pad size and location would be determined by the contractor in the field. The crane pad would provide a soil bearing capacity designed to provide a stable foundation for the crane and would be left in place post construction.

Turbine foundations will likely be spread footing and specifically designed as determined by geotechnical investigations. Spread footings, would be primarily buried underground to a depth of approximately 10 to 15 feet with a pedestal extending approximately 1 foot above ground. The base would be approximately 50 to 80 feet in diameter, depending on the turbine model selected. Prior to finalizing the location of each turbine, soil borings would be collected to verify soil and rock characteristics to an approximately 50-foot depth to ensure sufficient soil strength and bearing capacity to provide a stable foundation for the turbine.

2.2.2 Once construction is completed, a permanent 15-foot gravel ring would be placed around the base of the foundation. The gravel would provide a stable surface area for maintenance vehicles, and would minimize surface erosion and runoff. All temporarily impacted areas would be replanted with non-aggressive resident species that are compatible with wind farm operations, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere. This would be conducted in accordance with the Shasta County Fire Department, per a project-specific Fire Management Plan developed in concert with the Shasta County Fire Department. Electrical Collector System and Communications System

Power generated by the turbines would be collected by an electrical collector system which would consist of both aboveground and underground 34.5-kV power lines. This system would feed into an onsite collector substation, which would step up the voltage and transmit the power to the point of interconnect with the PG&E transmission system. The majority of the collector system would be located underground and installed adjacent to the onsite access road bed where possible. Where necessary, portions of the collector system would be above ground to transmit power that would otherwise require multiple underground cables, respond to construction challenges or to avoid environmental impacts. These include:

- Corridors where it is necessary to transmit more than 20 to 25 MW, which exceeds the capability of an underground cable.
- Steep terrain, where the use of backhoes and trenching machines is infeasible or unsafe;
- Stream and wetland crossings, where an aboveground line can avoid or minimize environmental impacts;
- The presence of cultural resources, where an aboveground line can avoid or minimize impacts; and
- The presence of soils with low thermal conductivity (preventing adequate heat dissipation from the conductor) or rocky conditions that significantly increase trenching costs.

For the underground portions of the electrical collector system, cables would be directly buried in trenches and would terminate at individual turbines, at locations where they connect to junction boxes, overhead power lines, or at the onsite substation. Depending on the subsurface conditions, the need for blasting is not expected but may be required to install the trenches. Each trench would contain power cables, a ground wire, a fiber optic communication cable for the Supervisory Control and Data Acquisition (SCADA) system (to transmit data from the turbine controllers to the onsite substation and O&M facility) and a marker tape above the cables to alert anyone digging in the area. Although designs have not been finalized, PWD anticipates that the underground collector cable system would be placed within a 46-inch-deep and at least 12-inch-wide cable trench generally located along the length of the proposed turbine access roads. Typical cable trench details used for construction of the underground electrical system are shown in Figure 5.

Where the underground collector system would be co-located with access roads no additional ground disturbance would occur in association with construction of the underground electrical collection system (i.e., disturbance is accounted for in association with the access roads). In areas where the underground collector system trenches are not able to be co-located with access roads, up to a 50-foot-wide temporary disturbance area would be required. Underground portions of the collector system would have no permanent impacts; however, a 30-foot-wide corridor would be maintained clear of large vegetation where underground collector lines deviate from paralleling access roads.

Above ground portions of the electrical collector system would have a maximum pole height of 90 feet and wire heights ranging from 20 to 30 feet above the ground unless special circumstances warrant different clearances. This will not be known until final construction drawings are completed. Clearing for installation of the overhead collector line would require a temporary workspace consisting of an approximately 100-foot-wide corridor centered on the overhead line, within which a 50-foot-wide corridor would remain permanently disturbed with low vegetation and two track access for maintenance. However, actual permanent impacts would be considerably less, limited to individual pole locations. PWD would design all aboveground collector lines in accordance with the Avian Protection Plan Guidelines prepared by the U.S. Fish and Wildlife Service (USFWS; USFWS 2005) and the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC 2012). All temporarily impacted areas would be replanted with non-aggressive resident species that are compatible with wind farm operations, such as short, native, slow-growing shrubs. A Habitat Restoration Plan and Vegetation Management Plan will be developed prior to construction. Typical overhead electrical collector pole design is shown in Figure 6.

2.2.3 Onsite Collector Substation and Switching Station

The onsite collector substation and switching station would increase the voltage of the electricity from the 34.5 kV collection system voltage to 230 kV, the same voltage as the existing PG&E 230-kV line. The switching station would be co-located with the substation and would facilitate the interconnection of the Project's electricity to the PG&E transmission line. Approximately 25 acres would be needed for construction of the substation and switching station. The final permanent footprint of the substation and switching station site would be approximately 5 acres for the collector station and 15 acres for the switching station and consist of a graveled area, fence, and parking area for maintenance vehicles.

2.2.4 Access Roads

Access to the Project site would be provided from State Route 299 onto existing logging roads. Internal Project access would be facilitated by the addition of new roads and the use of existing, privately owned logging roads, which would be improved as needed and widened to meet construction and maintenance activity requirements. Existing roads will be used to the extent possible. For the purpose of estimating maximum potential impacts, this discussion assumes the same level of disturbance for all Project access roads.

During construction, select portions of existing roads within the Project site would be widened to, and new access roads would be constructed to, approximately 40-foot drivable surface with 20 feet on each side for cut, fill, and construction, for a nominal 80-foot-wide total disturbance area. The road surface would be a graded and graveled all-weather surface. Based on the preliminary layout shown in Figure 2, PWD anticipates road modifications would be needed for portions of private logging roads off of State Route 299, to accommodate turbine component delivery and other large delivery trucks, potentially including cranes and other heavy construction equipment. However, the road layout may be modified as the Project design is refined to maximize use of existing roads.

As required, existing culverts would be replaced with wider or stronger culverts. For both new and existing roads, drainage improvements would be made in accordance with the Project's erosion control plan pursuant to the Project's National Pollution Discharge Elimination System (NPDES) permit. Figures 7a and 7b show typical road designs. For more information on cut and fill, grading, blasting and culvert locations see Section 2.3.

During operation, service vehicles and equipment would continue to use Project access roads for routine maintenance activities. Permanent access road widths would be reduced to 20-feet-wide drivable surface with a 1-foot shoulder on both sides and nominally up to an additional 6-feet on either side where required for stormwater drainage design. However, in areas where significant cuts and fills were required to construct the road, permanent disturbance may be as wide as 60 feet to accommodate stormwater controls and road design. Permanent access roads would be maintained through periodic grading and compacting to minimize naturally occurring erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

2.2.5 Temporary Construction and Equipment Area, Construction Trailer Area, Associated Parking Area, and O&M Facility

The temporary construction and equipment area, construction trailer area, and associated parking area would consist of an approximately 10-acre compacted gravel pad on a cleared and graded footprint (Figure 2). During construction, this area would be used to store large equipment and materials, to refuel equipment, and to collect and temporarily store construction waste. It would also serve to provide temporary parking, construction office space, and temporary (portable) sanitary facilities. Refueling of construction vehicles would be accomplished by a vendor supplied fuel truck making daily or weekly deliveries to approved storage tanks. It would not be practical to remove construction equipment from the wind farm site for refueling and general maintenance such as changing fluids and lubricating parts; therefore, these activities would take place onsite and some fuel will be stored onsite. Following construction, portions of the construction staging and equipment laydown area would be restored to pre-construction conditions through the removal of gravel and replanted with non-aggressive resident plant species that are compatible with Project operation, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere.

The O&M facility and its associated storage yard and parking area would consist of a permanent 5-acre area which may be located near the State Route 299 (Figure 2). Figure 8a, 8b, and 8c include a

typical plan and profile of the O&M building. During Project operation, large equipment required for maintenance could be staged in the O&M storage yard.

Water for the O&M facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Any efforts to install a domestic well would be conducted in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. Wastewater from the O&M facility would be processed using an on-site septic system. This system would conform to all County design standards and specifications to avoid impacts on ground- or surface waters.

2.2.6 Temporary Laydown Areas

Construction activities would require 17 2-acre laydown (staging) areas, located throughout the Project site to store and stage building materials and equipment. The laydown areas may be graveled depending upon site soil conditions. The temporary laydown areas would be removed upon completion of construction and replanted with non-aggressive resident species that are compatible with wind farm operations, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere. Planned locations for the temporary laydown areas are illustrated in Figure 2.

2.2.7 Temporary Wind Resource Remote Sensing Devices

Doppler effect instruments would be temporarily placed within the Project site to supplement wind resource data gathered by permanent meteorological towers (see following section). These ground-based instruments record ranges of wind resources using laser-based light detection and ranging (LiDAR) and sound detection and ranging (SODAR). Instruments, which are mounted to trailers and which would be transported to the Project site by pick-up truck, would be removed prior to construction.

2.2.8 Permanent Meteorological Towers

Two permanent MET towers would be constructed in the Project site. These towers support instruments that measure and record weather data to assess performance of turbines and guide Project operation. The MET towers would be up to 316 feet tall (Figure 9). Permanent MET towers are typically at the hub height of the turbine selected. Permanent MET towers 200 feet or taller would comply with FAA lighting regulations. All new permanent meteorological towers would be freestanding structures without guy wires to minimize impacts on avian species.

In addition, trailer-mounted SOnic Detection and Ranging (SODAR) and Light Imaging Detection and Ranging (LiDAR) units may be deployed on the Project site to further study wind speed, direction, and turbidity. Both SODAR and LiDAR units are typically mounted on a small utility trailer and can easily be moved using a standard pickup truck. No ground disturbing activity would occur during SODAR and/or LiDAR deployment or use.

2.3 Construction Activities

2.3.1 Grading

Ground-disturbing activities including clearing and grubbing, topsoil stripping, grading, compaction, utility trenching, and placement of aggregate surfacing would occur during the construction of the Project. Grading activities would consist of the removal, storage, and/or disposal of earth, gravel, vegetation, organic matter, loose rock, and debris. The cut and fill required for the Project would be balanced to the extent possible, to minimize the amount of materials that would need to be brought onto or removed from the site. Estimates of cut and fill cannot be determined until engineering for construction has been undertaken.

A site-specific Storm Water Pollution Prevention Plan (SWPPP) would be prepared for the Project. The SWPPP would identify best management practices (BMPs) that would be used to minimize or eliminate the potential for sediments and pollutants to reach surface waters through storm water runoff. To minimize impacts associated with soil erosion, PWD would prepare a Temporary Erosion and Sediment Control (TESC) Plan that would be implemented by the construction contractor. The TESC Plan would include standard storm water BMPs to reduce the risk of erosion.

To the extent practicable, the Project would maintain the local surface drainage patterns. New Project access roads would be designed to follow natural contours and minimize side hill cuts to the extent possible and would include other BMP such as ditches and culverts to capture and convey storm water runoff. Additionally, with the exception of areas where permanent surface recontouring is required, disturbed areas would be restored to pre-existing grades and all disturbed areas where permanent gravel or aggregate is not required would be revegetated. These measures would reduce the potential for erosion and adverse effects on drainage patterns.

In rocky areas, blasting may be necessary to loosen rock before excavation. If blasting is necessary, a Blasting Plan would be prepared to identify the locations that are anticipated to require blasting. All applicable federal, state, and local regulations for blasting procedures would be identified in the Blasting Plan and would be followed. Explosives would only be used within specified times and at specified distances when the work is located within or nearby sensitive habitat areas.

2.3.2 Transportation of Turbine Components

Turbine components may be transported to the Project area by highway transportation and assembled on site. Each turbine would require multiple deliveries. The specifics of these deliveries would depend upon the final turbine model selected; however, PWD anticipates that each turbine would require up to 15 separate loads, of equipment and materials to its pad, of which eight or nine would be oversized or superloads transporting turbine components. Towers are generally delivered in three, four, or five sections (depending on turbine selected). Each turbine blade, nacelle, rotor, and down-tower components (e.g., controllers, ladders and platforms, pad-mount transformers, pad-mounted transformer vaults, and turbine switchgear) would be delivered separately. Deliveries would be made using transport vehicles that conform to road weight limits;

any variances would be incorporated into permits submitted to the California Department of Transportation (Caltrans). A Traffic Assessment Report would be prepared prior to finalization of the Draft Environmental Impact Report. See Section 5.1 for a description of the scope of the Traffic Assessment Report.

2.3.3 Construction Schedule and Workforce

The Project construction period is expected to last 18 to 24 months. Construction would be completed during daylight hours, typically from 7am to 5pm but may be earlier or later during the summer months. There may be instances where those hours need to be extended earlier or later, such as during the delivery of superloads, and nighttime construction may occur to avoid traffic, adjust for high winds during daylight hours, and to facilitate schedule. The construction workforce is estimated to include up to 400 construction workers at any given time.

2.3.4 Construction Sequence

During the initial phase of Project construction, access roads would be established. This includes the widening of existing access roads where necessary and construction of new access roads. Temporary staging and laydown areas would also be established to serve as temporary storage for the tower sections, nacelles, blades, and other Project components.

Turbine laydown areas would be cleared including an area of approximately 5 acres (depending on the terrain) at each turbine for the crane pad, construction laydown area, and rotor assembly area. Within the graded turbine laydown area, a gravel pad would be established for supporting a crane to be used to erect the towers and turbines. Prior to construction of the turbine foundations, soil samples would be collected during the pre-construction and construction geotechnical investigation to assist in determine site-specific turbine foundations to be utilized during final engineering.

Once the foundations are constructed, the turbines would be assembled and erected using a combination of forklifts and construction cranes, located on the compacted earthen or gravel crane pad. Construction equipment requiring access to these areas would include both wheeled and tracked vehicles. Cranes used to assemble the turbine components would be delivered to the wind farm site in multiple loads and assembled on site.

While turbines are being installed, construction of the substation, underground and overhead collection system, and O&M building would occur. Once all facilities are constructed, final testing would occur to ensure all systems are working property and according to design. Also, as construction is completed, the temporarily used portions of the construction staging and equipment laydown areas, turbine pad laydown areas, and access roads would be restored to pre-construction conditions through the removal of gravel and reseeded to return the area to its original condition.

Throughout construction, erosion control procedures would be implemented in accordance with the NPDES permit and the associated SWPPP and TESC. A final site cleanup, including removal of all waste materials, would also be conducted.

2.3.5 Use of Hazardous Materials

Hazardous materials are required during construction and operation of wind energy generation projects. Table 2-2 summarizes materials typically used for such projects, with details about their use and typical quantities.

Table 2-2. Hazardous Materials Associated with Typical Wind Energy Generation Projects

Hazardous Material	Uses	Typical Quantities Present
Fuel: diesel fuel [a]	Powers most construction and transportation equipment during construction and decommissioning phases. Powers emergency generator during operational phase.	The Project estimate is over 5,000 gallons to be stored in aboveground tanks during construction. An unknown amount would be used during decommissioning. [b]
Fuel: gasoline [c]	Used for some construction equipment and transportation vehicles	Because of the limited number of construction and transportation vehicles utilizing gasoline, no onsite storage is likely to occur throughout any phase of the Project.
Fuel: propane [d]	Most probable fuel for ambient heating of the control building	Typically 500 to 1,000 gallons stored in an aboveground propane storage vessel.
Lubricating oils/grease/hydraulic fluids/gear oils	Lubricating oil is present in some wind turbine components and in the diesel engine of the emergency power generator.	Limited quantities stored in portable containers (capacity of 55 gallons or less); maintained onsite during construction and decommissioning.
	Maintenance of fluid levels in construction and transportation equipment.	Limited quantities stored in portable containers (55 gallons or less); stored onsite during operational phase.
	Hydraulic fluid is used in the rotor driveshaft braking system and other controls.	
	Gear oils and/or grease are used in the drivetrain transmission and yaw motor gears.	
Glycol-based antifreeze	Present in some wind turbine components for cooling (e.g., 5 to 10 gallons present in recirculating cooling system for the transmission).	Limited quantities (10 to 20 gallons of concentrate) stored onsite during construction and decommissioning.

Table 2-2. Hazardous Materials Associated with Typical Wind Energy Generation Projects

Hazardous Material	Uses	Typical Quantities Present
	Present in the cooling system of the diesel engine for the emergency power generator.	Limited quantities (1 to 10 gallons of concentrate) stored onsite during operational phase.
Lead-acid storage batteries and electrolyte solution	Present in construction and transportation equipment.	Limited quantities of electrolyte solution (<20 gallons) for maintenance of construction and transportation equipment during construction and decommissioning.
	Backup power source for control equipment, tower lighting, and signal transmitters.	
Other batteries (e.g., nickel-cadmium batteries)	Present in some control equipment and signal-transmitting equipment.	No maintenance of such batteries is expected to take place onsite.
Cleaning solvents	Organic solvents (most likely petroleum-based but not listed under the Resource Conservation and Recovery Act) used for equipment cleaning and maintenance.	Limited quantities (<55 gallons) onsite during construction and decommissioning to maintain construction and transportation equipment.
	Where feasible, water-based cleaning and degreasing solvents may be used.	Limited quantities (<10 gallons) onsite during operations.
Paints and coatings [e]	Used for corrosion control on all exterior surfaces of turbine towers.	Limited quantities for touch-up painting during construction (<50 gallons) and for maintenance during operations (<20 gallons).
Dielectric fluids [f]	Present 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.	Limited quantities equal to only the amount necessary to complete the task.
	May be necessary for construction of access and/or onsite roads or for grade alterations.	Onsite storage expected to occur only for limited periods of time as needed by specific excavation and construction activities.
Herbicides	May be used to control vegetation around facilities for fire safety.	If deemed necessary, herbicides would likely be brought to the site and applied by a licensed applicator.

Adapted from "Typical" windfarm equipment lists

Notes:

[a] It is assumed that commercial vendors would replenish diesel fuel stored onsite as necessary.

Table 2-2. Hazardous Materials Associated with Typical Wind Energy Generation Projects

Hazardous Material	Uses	Typical Quantities Present

[b] This value represents the total onsite storage capacity, not the total amount of fuel consumed (see footnote a, above). Onsite fuel storage during construction and decommissioning phases would likely be in aboveground storage tanks with a capacity of 500 to 1,500 gallons. Tanks may be of double-wall construction or may be placed within temporary, lined earthen berms for spill containment and control. At the end of construction and decommissioning phases, any excess fuel, as well as the storage tanks, would be removed from the site, and any surface contamination resulting from fuel handling operations would be remediated.

[c] Gasoline fuel is expected to be used exclusively by on-road vehicles (primarily automobiles and pickup trucks). These vehicles are expected to be refueled at existing offsite refueling facilities.

[d] Delivered and replenished as necessary by a commercial vendor.

[e] It is presumed that all wind turbine components, nacelles, and support towers would be painted at their respective points of manufacture. Consequently, no wholesale painting would occur onsite; only limited amounts would be used for touch-up purposes during construction and maintenance phases. It is further 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.

[f] It is assumed that transformers, bushings, and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication. However, very large transformers may be shipped empty and have their dielectric fluids added (by the manufacturer's representative) after installation. It is further assumed that servicing of electrical devices that involves wholesale removal and replacement of dielectric fluids would not likely 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.

2.4 Operations and Maintenance Activities

PWD anticipates employing up to 12 full-time employees upon commencing commercial operation of the Project. Technician staffing is commensurate with site needs which are primarily driven by turbine type. Operation and maintenance activities would generally occur during normal work day hours from Monday to Friday with call outs 7 days a week after normal business hours. Avangrid Renewables National Control Center located in Portland, Oregon would monitor and control the turbines through the SCADA monitoring system 24 hours a day, seven days a week. The system would perform self-diagnostic tests and allow a remote operator to set new operating parameters, perform system checks, and ensure turbines are operating at peak performance. Turbines would automatically shut down if sustained winds or gusts exceed predetermined maximum operating parameters.

On-site equipment during Project operation would include utility vehicles and other equipment that are necessary for operation and maintenance activities. Each turbine would be serviced periodically (e.g., twice a year), or as needed. Typical turbine servicing activities may include temporarily deploying a crane within the construction easement of each turbine, removing the turbine rotor, replacing generators, bearings, and deploying personnel to climb the towers to service parts within the turbine.

The Project would develop and implement a Fire Protection Plan (FPP) prior to construction and operation. The FPP will include emergency response and evacuation procedures that would include

immediate reporting notification of local fire agencies. Staff would be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire.

Environmental monitoring would be conducted in accordance with the approved mitigation and monitoring plan. This may include avian monitoring surveys and monitoring to ensure maintenance of erosion control measures.

The anticipated operational life of the Project is 40 years. After that time, PWD would evaluate whether to continue operation of the Project or to decommission it in accordance with the Decommissioning Plan.

2.5 Project Decommissioning

If, at the end of its anticipated life, the Project is decommissioned, the goal of decommissioning would be to remove the power generation equipment and return the site to a condition as close to its pre-construction state as possible. A Draft Decommissioning Plan would be prepared prior to operations. It is anticipated that requirements in effect at the time of decommissioning would require that all turbines and ancillary structures be removed from the site. The plan would be revised prior to the termination of the Oxbow Timber I, LLC land lease and implemented once the Project has ceased operation. The Final Decommissioning Plan would be developed in compliance with the standards and requirements for closing a site at the time decommissioning occurs.

When the facility is decommissioned, the turbine components would be removed from the site and the materials would be reused, recycled, or sold for scrap. Decommissioning activities are anticipated to have similar types of construction-related activities. Therefore, all management plans, BMPs, and stipulations developed for the construction phase of the Project would be applied to the decommissioning phase of the Project. Topsoil from all decommissioning activities would be salvaged and reapplied during final reclamation to the extent possible. Working with the land owner, all disturbed soil will be replanted with trees. The vegetation cover, composition, and diversity would be restored to values commensurate with the area's ecological setting. A Decommissioning Plan will address the following procedures: facility dismantling and removal, site restoration, habitat restoration, monitoring and estimated costs.

3.0 Required Approvals and Permits

The county, state, and federal permits that may be required for the Project are listed in Table 3-1 below.

Table 3-1. Approval and Permits Potentially Required for the Proposed Project.

Jurisdiction	Permit or Approval
County	Shasta County Use Permit
	Shasta County Building Division – building and grading permits
	Department of Resource Management Environmental Health Division—septic system permit
	Department of Resource Management Environmental Health Division—well permit
State	California Department of Forestry & Fire Protection—timberland conversion permit
	California Department of Transportation Division of Aeronautics—permit required per PUC Section 21656
	California Department of Fish and Wildlife (CDFW) Incidental Take Permit under California Environmental Species Act (CESA) Section 2081
	CDFW Notification of Lake or Streambed Alteration under Fish and Game Code Section 1602 CDFW Lake or Streambed Alteration Agreement under Fish and Game Code Section 1603
	Shasta County Air Quality Management District Authority to Construct and Permit to Operate for proposed concrete batch plants
	California Regional Water Quality Control Board—NPDES General Construction Permit, CWA Section 401 Water Quality Certification
Federal	Federal Energy Regulatory Commission—approval to be an Electric Wholesale Generator and to sell electricity at market-based rates
	Federal Aviation Administration—notice of proposed construction
	USFWS Incidental Take Permit under Section 10 of the Federal Endangered Species Act
	Consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA) including the preparation of a Cultural Resources Report consistent with Section 106 of the NHPA and Section 15064.5 of California Code of Regulations related to CEQA and Historic Resources.
	US Army Corps of Engineers Nationwide or Individual permit under CWA Section 404

4.0 Environmental Factors

4.1 Aesthetics

a) Would the project have a substantial adverse effect on a scenic vista?

The turbines, with heights of up to 591 feet, would be the primary source of long-term visual impact from the Project. The turbines would be taller than the surrounding vegetation. Given the height of the turbines, their placement on ridgelines, and the rural nature of the Project area, the turbines would be visible from certain viewpoints. Views of the turbines from some viewpoints are expected to not be avoidable because of their size and exposed location. Visibility of the turbines would be blocked or partially obscured by topography in some locations, however, and could be diminished

in other locations because of factors such as distance from viewers, the angle of observation, atmospheric conditions, and the presence of vegetation and/or structures. A viewshed analysis will be conducted to identify the areas from which at least a portion of one or more turbines would potentially be visible, based on line-of-sight conditions determined by topography. See Section 5.2 for a description of the scope and timing of the viewshed analysis.

In addition to the size, form, and color of the turbines, another source of visual contrast from the operation of the Project would be the introduction of motion into a static landscape. The oscillating motion of turbine blades often draws the eye of potential viewers and creates more contrast than does a static structure of similar size and form. Other Project facilities that would have relatively limited visual impact would be access roads, electrical collection and communication networks, substation and two permanent meteorological towers. These features would be much smaller and would generally create much less visual contrast than the turbines.

At nighttime, the substation and the turbines would be minimally lit in accordance with the FAA. This would create a new light source in the wind farm site. Much like the motion of the blades during daytime operations, the blinking safety lights can draw the attention of a casual observer.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

There are no roadways in or near the Project area that are designated in federal or state plans as a scenic highway or route worthy of protection for maintaining and enhancing scenic viewsheds. However, State Route 89, located approximately 11 miles east of the Project area, and State Route 44, located approximately 18 miles south of the Project area, are designated as Eligible State Scenic Highways. Also, Section 6.8, Figure SH-1 of Shasta County's General Plan designates the Hatchet Ridge Summit on Highway 299 as a "Gateway or location that marks the entrance to a community of geographic area" (Shasta County 2004). Figure SH-1 also shows State Route 299 from Bella Vista east to the Hatchet Ridge Summit gateway and State Route 44 from Old Station to Millville as a "corridor in which the natural environment is dominant" and State Route 299 from the Hatchet Ridge Summit gateway to Burney as a "corridor in which natural and manmade environment contrast" (Shasta County 2004).

The Project would likely not be visible from the Hatchet Ridge Summit due to existing coniferous vegetation limiting views from the State Route 299; however, the Project may be visible from viewpoints along State Route 299 from Belle Vista east to the Project and from Burney west to the Project. The Project may also be visible from certain viewpoints along State Route 89; however further investigation and analysis will be conducted to assess the visibility of the Project from State Routes 44, 89 and 299 and to assess the potential impacts to the viewshed. See Section 5.2 for a description of the scope and timing of the viewshed analysis and analysis of potential visual effects.

c) Would the Project substantially degrade the existing visual character or quality of the site and its surroundings?

Given the height of the turbines, their placement on ridgelines, and the rural nature of the Project area, the turbines would be highly visible from certain viewpoints. Views of the turbines could not

be avoided because of their size and exposed location. Visibility of the turbines would be blocked or partially obscured by topography in some locations, however, and could be diminished in other locations because of factors such as distance from viewers, the angle of observation, atmospheric conditions, and the presence of vegetation and/or structures. A viewshed analysis will be conducted to identify the areas from which at least a portion of one or more turbines would potentially be visible, based on line-of-sight conditions determined by topography. See Section 5.2 for a description of the scope and timing of the viewshed analysis and subsequent evaluation of potential visual effects.

d) Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Pursuant to 14 CFR 77, temporary or permanent structures higher than 200 feet above mean sea level or exceeding any obstruction standards should generally be marked or lighted. In compliance with FAA regulations, the turbines will be equipped with synchronized red flashing lights to satisfy FAA marking and lighting requirements.

Due to the nature of the Project, views of the turbines and the resulting visual impacts are difficult to mitigate, though a few specific design standards will be implemented to reduce visual impacts to the extent practicable. Turbines and towers will be painted a uniform matte white or off-white as recommended by the FAA; the use of a matte finish would inhibit reflections or glare. No signs, writing, or advertising would be permitted on the turbines. The turbines would not be lighted with the exception of the synchronized red flashing lights to satisfy FAA marking and lighting requirements. Where lighting may be necessary elsewhere on the Project, such as at the substation or O&M facility, lights would be shielded and directed downward and inward toward the facilities to prevent offsite glare.

A viewshed analysis will be conducted to identify whether nighttime views would be affected from the turbines equipped with red flashing aviation lights. See Section 5.2 for a description of the scope and timing of the viewshed analysis and related evaluation of potential visual effects.

4.2 Agriculture and Forestry Resources

a) Would the Project convert Prime Farmland, Unique Farmland, or Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The majority of the Project area is considered Other Land by the Farmland Mapping and Monitoring Program (FMMP). A portion of the Project area near State Route 299 is designated by the FMMP as Grazing Land. The Project site does not contain land currently designated as prime, unique, or important farmland by the FMMP. Therefore, the proposed Project would not convert prime farmland, unique farmland, or farmland of statewide importance to nonagricultural use and there would be no impact.

b) Would the Project conflict with existing zoning for agricultural use, or a Williamson Act Contract?

Construction of an electric generating facility is allowed in the TP district with the issuance of a Use Permit. Based on the review of a 2006/2007 Shasta County Williamson Act map (California Department of Conservation 2017), the Project area is not currently under a Williamson Act Contract nor is it zoned for agricultural use by Shasta County. Consequently, the Project would not conflict with existing zoning for agricultural use or a Williamson Act Contract.

c) Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?

The Project would result in permanent conversion of 972 acres of timberland to non-timberland use in the area where there is a permanent Project disturbance (i.e. the turbine pads, new access roads, O&M facility, and substation). The total leased area for the Project is approximately 37,436 acres. All areas within the Project area boundary beyond the Project's permanent disturbance or maintained vegetation would remain in timber production, and the Project will coordinate with the landowner, Oxbow Timber I, LLC, to restore temporarily disturbed areas (approximately 2,167 acres) to timber harvesting use after Project construction is complete. The precise location of turbines is not presently known. Upon determination of turbine sites, any trees requiring removal, or any tree(s) scheduled to be harvested during the construction period, will be harvested prior to initiation of construction activities in that location. Construction or operation of the Project is not anticipated to affect timber harvesting activities outside of the temporary or permanent disturbance areas.

As discussed in greater detail in Section 4.10 below, the Project area is partially zoned as a TP district in Chapter 17.08 of the Shasta County Zoning Ordinance. Uses permitted within the TP zoning district generally consist of forest management including the growing and harvesting of timber and uses compatible with the growing and harvesting of timber. Construction of an electric generating facility is allowed in the TP district with the issuance of a Use Permit.

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4.3 Air Quality

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

The Project would not conflict with or obstruct implementation of the Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan as adopted by Shasta County, or any other applicable air quality plan.

b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation? c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emission which exceed quantitative thresholds for ozone precursors)? d) Would the project expose sensitive

receptors to substantial pollutant concentrations? e) Would the project create objectionable odors affecting a substantial number of people?

Construction of the Project would result in the emission of some pollutants as well as the generation of fugitive dust. Heavy equipment (such as trucks, cranes, and earthmovers) would be required in order to construct this Project. The internal combustion of fuels to power this equipment would generate green-house gases and air pollutants. In addition, soil disrupting activities associated with construction of the Project may result in the generation of fugitive dust. Air pollutant emissions and fugitive dust levels would be highest near the Project's construction sites (where the majority of activities would occur); however, lower levels of emissions and fugitive dust would also occur along travel routes to and from the Project area. Operation of the Project has the potential to impact air quality as some emissions would be produced via the internal combustion of fuels for vehicles used by the Project's employees as well as some heavy equipment, such as cranes that may be required periodically for maintenance or repair of the Project.

Construction and operation of the Project would have a minor effect to air quality because Project related emissions and increased fugitive dust levels would be temporary in nature, would occur at relatively low levels compared to the State and Federal ambient air quality standards, and BMPs would be implemented to minimize the effects of these emissions. The Applicant will implement standard BMPs in order to avoid or minimize impacts to air quality. These include measures to limit fugitive dust generation, limit the risk of wildfires, and requirements to keep all equipment in proper working order.

4.4 Biological Resources

a) Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? b) Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local of regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Construction of the Project would result in temporary and permanent ground clearing and vegetation removal for installation of Project facilities. Temporary disturbances would occur during construction of the underground and overhead electrical collection system, as well as in temporarily cleared areas around turbine pads, and construction staging and equipment laydown areas. Permanent ground disturbance includes a subset of the construction related disturbance where permanent facilities will be located including the O&M facility and associated parking and storage area, the substation and switching station, the permanently cleared areas around each turbine pad, met towers, and the permanent access roads.

Due to these temporary and permanent disturbances, the Project may have direct or indirect (through habitat modifications) effects on candidate, sensitive, or special status species or on riparian habitat or other sensitive natural community identified in local of regional plans, policies,

and regulations or by the California Department of Fish and Wildlife or USFWS. A Site Characterization Study (SCS) will be conducted to assess the presence of habitat for species of concern at the landscape level, assess the potential for presence of plant and wildlife species of concern on the Project, assess the potential occurrence of areas that may be precluded from development, assess the potential presence of plant communities on the Project that may provide habitat for wildlife species of concern, and assess the potential areas of wildlife concentrations within the Project.

Based on information gathered during the Study, and through consultation with the landowner biologist and agency representatives, sensitive species surveys for both wildlife and plants may be conducted if sensitive species (or their habitat) is identified within the Project area. See Section 5.3 for a description of the scope and timing of the SCS and biological surveys being conducted in support of Project permitting, which include baseline wildlife surveys. A Habitat Restoration Plan and a Vegetation Management Plan would be developed for the Project. Additionally, an Invasive Species Management Plan, as warranted, may be developed for implementation during construction of the Project.

c) Would the Project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means?

The Federal Water Pollution and Control Act was initially established by the U.S. Congress in 1948, and revised significantly in 1972 when it became known commonly as the Clean Water Act (CWA). This act is intended to protect the quality of waters in the U.S., including the physical, chemical and biological properties of these waters (CWA 1972). Waters protected under the CWA are not limited simply by navigability, as upstream waters, headwaters, and connected wetlands are known to impact the integrity of downstream navigable waters. The CWA thus plays an important role in controlling pollutants or sediments that may enter watersheds through varying means. The CWA is administered by the Environmental Protection Agency and the United States Army Corps of Engineers (USACE).

Due to the temporary and permanent disturbances described above, the Project may have adverse effect on federally protected wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means. The Applicant will conduct a desktop assessment of the waters, including wetlands, at the Project, in order to inform preliminary design of the Project as well as a future field delineation of jurisdictional waters. The Applicant will communicate with the USACE, if necessary, in an effort to determine the potential occurrence of jurisdictional waters at the Project, and will also consult available public information sources such as the National Wetlands Inventory (NWI), which is operated by the USFWS. Additional resources may include examination of aerial imagery or U.S. Geological Survey (USGS) topographic maps. See Section 5.3 for a description of the scope and timing of the biological surveys being conducted in support of Project permitting.

d) Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife

corridors, or impede the use of native wildlife nursery sites? e) Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? f) Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community, Conservation Plan, or other approved local, regional, or State habitat conservation plans?

Due to the temporary and permanent disturbances described above, the Project may have adverse effect on wildlife species, migratory wildlife corridors, and other biological resources. A SCS will be conducted to assess the presence of habitat for species of concern at the landscape level, assess the potential for presence of plant and wildlife species of concern on the Project, assess the potential occurrence of areas that may be precluded from development, assess the potential presence of plant communities on the Project that may provide habitat for wildlife species of concern, and assess the potential areas of wildlife concentrations within the Project.

In addition to the SCS, a number of baseline wildlife studies are planned in accordance with the USFWS Land-Based Wind Energy Guidelines (WEG; USFWS 2012) Tier 3 – Field Studies, to document wildlife and habitat in the Project area and to predict Project impacts. A description of the scope of these studies and surveys is included in Section 5.3.

There are no currently adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans for the Project area or its vicinity. The Project would not conflict with any habitat conservation plan.

4.5 Cultural Resources

a) Will the Project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? b) Will the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

A Cultural Resources Report will be prepared by Stantec Environmental, LLC, consistent with Section 106 of the 1966 National Historic Preservation Act and Section 15064.5 of California Code of Regulations related to the California Environmental Quality Act (CEQA) and Historic Resources, regarding the identification and protection of historic resources and unique archaeological resources (per CEQA's definition). The Applicant's cultural resource consultant will conduct a review of existing information, will coordinate with Native Americans, and will conduct field surveys of the Project site in accordance with state and county regulations. If any cultural resources are found, they will be evaluated for significance (per CEQA definition) and any effects on these resources by Project facilities or activities will also be evaluated. If historic resources or unique archaeological resources are identified in the Project site and evaluated as potentially being impacted by the Project, the Applicant will develop and implement measures to mitigate the effects of the Project on these resources.

A Draft Cultural Resources Report is expected to be available by September 2017.

c) Will the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Records searches and map research will be conducted by the Applicant's cultural resources consultant to determine the likelihood of the Project site containing paleontological resources, in accordance with the 2010 Paleontological Resources Preservation Act. Results of these investigations, including an evaluation of effect on any identified paleontological resources, shall be included in the Cultural Resources Report.

d) Will the Project disturb any human remains, including those interred outside of formal cemeteries?

The Applicant's cultural resource consultant will confirm the presence or lack of presence of known human remains within the Project site. As part of the preparation of the Cultural Resource Report, coordination with Native Americans will be conducted. If human remains are discovered during the review of existing information, coordination with Native Americans, or through field surveys of the Project site, the Project design will avoid these remains to the extent practicable. If human remains are discovered during ground-disturbing activities, the Applicant's construction contractors will be required to stop work until the Shasta County coroner has been informed and determines that no investigation of the cause of death is required; and if the remains are of Native American origin, protocols under California Public Resource Code Section 5097.98 are followed. By following this "stop-work" protocol, impacts to human remains would be minimized.

4.6 Geology/Soils

A) Will the Project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- ***Rupture of a known earthquake, fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publications 42.***
- ***Strong seismic ground shaking?***
- ***Seismic-related ground failure, including liquefactions?***
- ***Landslides?***

The Project will be located on private timber land and would not expose any people or existing structures to loss, injury, or death due to the above mentioned factors.

B) Will the Project result in substantial soil erosion or the loss of topsoil?

Soil types are mapped in Figure 6 of the desktop geotechnical report (Appendix A). Soils identified within the Project area have slight to high or slight to moderate erosion hazard. A grading permit will be required prior to any grading activities. The grading permit includes requirements for erosion and sediment control, including retention of topsoil.

C) Will the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

The Project is located within a seismically active region, although the area of the site is relatively low hazard (Shasta County 2011). There are no active faults mapped in the region. As noted in the attached desktop geotechnical report (Appendix A), seismicity in the Project area is relatively low intensity and will not be a controlling factor for turbine foundation design and therefore should not expose the Project's structures to risk of loss due to seismic ground shaking or liquefaction.

The Project area does have some steep slopes exceeding 25% and the likelihood of slope failure/landslides is high in specific portions of the Project area. Further evaluation of slope stability will be conducted and each turbine site will be evaluated for stability before finalizing the location of turbines.

D) Will the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

A desktop geotechnical analysis was completed in January 2017 indicating that a preliminary field investigation may not be warranted. A final geotechnical investigation will be performed prior to final design and construction.

E) Will the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?

Prior to obtaining a Shasta County septic permit, further geotechnical investigations will be conducted to identify whether the soils are suitable for adequately supporting a septic system.

4.7 Greenhouse Gas Emissions

a) Will the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Impacts associated with greenhouse gas emissions are more appropriately evaluated on a regional level than at a project scale as greenhouse gas impacts on the atmosphere are generally independent of the point of emission. The internal combustion of fuels to power heavy equipment for construction as well as vehicles trips associated with the Project construction and operation would generate greenhouse gases. However, construction and operation-related emissions would occur at a low enough level that they are expected to have a negligible effect to climate change.

b) Will the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?

The Project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases.

4.8 Hazards and Hazardous Materials

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Construction of the Project involves the routine transport, use, storage, and disposal of hazardous materials. Construction requires the operation of heavy equipment and construction vehicles.

Hazardous materials required for construction equipment include antifreeze, diesel fuel, gasoline, hydraulic oil, lube oil, and grease. It would not be practical to remove construction equipment from the wind farm site for refueling and general maintenance such as changing fluids and lubricating parts; therefore, these activities would take place onsite. Other hazardous or regulated materials that would be used during construction include paints, adhesives, curing compounds, concrete, bentonite, and fertilizer. Construction equipment used to mix and pour concrete would be washed onsite because it would not be practical to remove this equipment from the site for washing. There would be waste disposal and collection receptacles and sanitary facilities on site during construction.

In accordance with the California Health and Safety Code and California Code of Regulations the Applicant will prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan (HMBP) that details proper procedures for storing and using hazardous materials and storing and disposing of hazardous waste. The plan would contain sufficient detail to address the purpose of the plan and to readily translate into the actions necessary to comply with relevant regulations. The plan would include information about site activities, site contacts, worker training procedures, and a hazardous materials inventory in accordance with Article 80 of the Uniform Fire Code. Regulatory requirements and standard industry BMPs for managing the routine transport, use, storage, and disposal of hazardous materials, petroleum products, and solid waste would be implemented and implementation of these measures would ensure impacts are minor.

The amounts of hazardous materials required during O&M would be less than the amounts needed for construction and storage would be limited to designated areas on the wind farm site. The HMBP would be updated with information about hazardous materials pertaining to the O&M phase, BMPs for managing hazardous materials would be implemented, and appropriate control measures such as secondary containment to contain leaks and spills would be provided.

Hazardous materials would be stored in the O&M facility and storage sheds and used at each turbine. Specific hazardous materials inventories, including quantities, would be documented in the HMBP and updated annually or as required by regulation. Nonhazardous batteries would be stored at the substation. Inspections of each of these facilities for leaks and spills would be done at least monthly. Implementing these measures would ensure that impacts would be minor.

All fuels, waste oils, and solvents will be collected and stored in tanks or drums within a secondary containment area consisting of an impervious floor and bermed sidewalls capable of holding the volume of the largest container stored within. The Applicant will ensure that all equipment operating in or near a drainage, or in a basin, is in good working condition, and free of leaks. All vehicles will have drip pans during storage to contain minor spills and drips. No refueling or storage will take place within 100 feet of a drainage channel or structure. Spill containment materials will be on site or readily available for any equipment maintenance or refueling that occurs adjacent to a drainage. In addition, all maintenance crews working with heavy equipment will be trained in spill containment and response.

The Project area is not within 0.25 miles of an existing or proposed school. The closest school, Montgomery Elementary School, is 1.5 miles away from the project boundary.

Although not a hazardous material, towers will be set back 100 feet from non-participating properties.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Construction of the Project on sites listed as hazardous by government agencies could expose employees and the public to hazardous materials. The Applicant will prepare a Phase I Environmental Site Assessment of the Project site (Phase I ESA) in accordance with either ASTM E1527-13 or E2247-08. The Phase I ESA will identify if the Project site includes any hazardous materials sites as identified by California Department of Toxic Substances Control.

The Project site is undeveloped and much of it is located at higher elevation than surrounding land. This decreases the possibility of migration of toxic substances from surrounding land onto the Project site. However, naturally occurring hazardous materials such as asbestos could be encountered during construction. If hazardous materials are present onsite, the development and implementation of a HMBP would mitigate any impacts.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the Project area? f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the Project area?

There are three publicly operated airports in Shasta County: Fall River Mills Airport, Redding Municipal Airport, and Benton Field. The Project area is no more than approximately 20 miles from the closest airport (Fall River Mills Airport). The Project area is not within an airport protection area which includes the lands laying within the approach zones, transitional zones, and conical zones as they apply to a particular airport.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

There is no currently adopted emergency response plan for the Project area, and the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan for a neighboring populated area (e.g., Burney, Moose Camp, and Montgomery Creek).

h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized area, or where residences are intermixed with wildlands?

The Project area is located in a "Very High Fire Hazard Severity Zone" according to Figure FS-1 in the Shasta County General Plan (Shasta County 2004). In August 1992, the Fountain Fire burned 64,000 acres, including portions of the Project area. Much of the Project area has been replanted; however, vegetation is still recovering.

The Project could increase the potential for wildfires associated with the use of vehicles and electrical equipment and increased human presence during construction of the Project. Sparks from vehicles and construction equipment, heated mufflers, spark producing construction activities such as welding, and improper disposal of matches or cigarettes, for example, could start a fire. There would also be increased presence and use of petroleum products, including oils and lubricants onsite, thereby increasing the potential for fires.

The Project will develop and implement an FPP prior to construction and operation. With implementation of the FPP, the impacts to the Project related to wildfires during the O&M phase are anticipated to be very low. The risk of fire is further minimized by the design features of the turbines. Fire prevention features will be incorporated within the turbines.

The FPP will include emergency response and evacuation procedures that would include immediate notification of local fire agencies. Staff would be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. These measures may include, but are not limited to equipping earthmoving and portable equipment with internal combustion engines with spark arrestors, requiring vehicles to carry fire suppression equipment when onsite such as fire extinguishers, flappers, and shovels, and storing fire suppression tools at designated locations within the wind farm. Fuel breaks will also be maintained around Project facilities including the turbines, substation, and O&M facility in accordance with the Fire Plan (per Public Resource Code 4290).

4.9 Hydrology/water quality

a) Will the Project violate any water quality standards or waste discharge requirements? f) Would the Project otherwise substantially degrade water quality?

Due to the temporary and permanent disturbances described in Section 2 above, the Project may have potential for increased erosion and sedimentation from ground disturbing activities primarily associated with construction. Prior to construction, a NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit), will be obtained from the Central Valley Water Board. Coverage under a General Construction Permit requires the preparation of a SWPPP and Notice of Intent (NOI). The SWPPP will include pollution prevention measures (erosion and sediment control measures and measures to control non-storm water discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, a detailed construction timeline, and a BMP monitoring and maintenance schedule. The NOI will include site-specific information and the certification of compliance with the terms of the General Construction Permit.

b) Will the Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a new deficit in aquifer volume or lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Impermeable surfaces created by the Project would be limited to the concrete tower foundations, substation, and O&M facilities. Access roads, laydown areas, and staging areas will be gravel and therefore permeable. The introduction of a limited extent of impermeable surface associated with the Project would not significantly alter the groundwater recharge or available groundwater supplies.

Water for the operations and maintenance facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Any efforts to install a domestic well would be conducted in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. The Applicant anticipates that less than 5,000 gallons of water will be used per day for operations and maintenance. Construction of a domestic well and groundwater use for operation would only occur if the Applicant determines groundwater is available in the Project area and sufficient to support the Project's uses. It is unlikely the Project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

c) Will the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? d) Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite? e) Would the Project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

To the extent practicable, the Project would maintain the local surface drainage patterns. New access roads would be located to follow natural contours and minimize side hill cuts to the extent possible and would include other BMPs such as ditches and culverts to capture and convey storm water runoff. Prior to obtaining a grading permit for the Project, the construction contractor will confirm storm water runoff requirements and, if necessary, incorporate storm water control measures such as seepage pits, drywells, and/or detention basins.

Impermeable surfaces created by the Project would be limited to the concrete tower foundations, the substation, and O&M facilities. Access roads, laydown areas, and staging areas will be gravel and therefore permeable. Permanent storm water control structures would be installed to prevent erosion where access roads, buildings, storage areas, and parking areas are constructed. Upon completion of construction, all disturbed areas where permanent gravel or aggregate is not required would be revegetated. Erosion control measures included in the TESC Plan would also

prevent water quality degradation from storm water runoff during the operational phase of the Project.

g) Would the Project place housing within 1000-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? h) Would the Project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

The Project does not include placing housing within 1000-year flood hazard area. The Project area is in an area of minimal flood hazards (Zone X). However, the Project area is generally located along mountain ridges and above the floodplain.

i) Would the Project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

The Project is not located within an area susceptible to flooding as a result of the failure of a levee or dam.

j) Would the Project have potential for inundation by seiche, tsunami, or mudflow?

Lakes near the Project area are lower in elevation than the Project area and therefore do not pose a significant threat of a seiche. The Project is inland and not at risk of a tsunami. A large portion of the Project experienced a forest fire in 1992 and may consequently be at greater risk of significant erosion and mudflows than the area was before the fire. Because the Project would not significantly increase runoff from the Project site or significantly alter existing drainage patterns, operation of the Project would not contribute to the risk of mudflows in the Project area. Although construction activities for the Project would involve grading activities that could potentially increase erosion in the area and the potential for mudflows, compliance with CWA requirements and provisions of the County Grading Ordinance would ensure that this impact is less than significant.

4.10 Land use/planning

a) Will the Project physically divide an established community?

Burney is the largest established community near the Project area, located approximately 6 miles east of the Project area. The community of Moose Camp is located closer to the Project area (within 1/5 mile of the closest turbine); however, Project facilities would not create any access issues to or from this community and would not physically divide it.

b) Will the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The lands underlying the Project are within the TP and U zoning districts. SCC Section 17.08.030(D) pertains to the TP district and conditionally allows the construction of "gas, electrical, water, or communication transmission facility, or other public improvements, in accordance with Government Code Section 51152." Per SCC Section 17.64.040, wind energy systems are

conditionally permitted in the U district as long as it is not otherwise prohibited by law and not inconsistent with any portion of the General Plan. The Project, which would convert 972 acres of an approximately 37,436-acre project area from timberland to non-timberland use (see Section 4.2), is consistent with General Plan as the U district lands underlying the Project are timberlands outside of the Timber Protection Zone and as such, power generation facilities are an allowed use per General Plan Policy 6.2.4, T-d.

Also, per SCC Section 17.88.035, a Use Permit is required in all districts for wind energy systems which do not meet the definition of "small wind energy system" (e.g. wind energy systems greater than 50 kilowatts in size). A Use Permit application has been prepared pursuant to SCC Section 17.92.020m, which are the rules governing Use Permits.

Because the General Plan designation and zoning district underlying the Project conditionally allow electrical power facilities, the Project is considered to be consistent with the General Plan designation and zoning.

c) Will the Project conflict with any applicable habitat conservation plan or natural community conservation plan?

There are no currently adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans for the Project area or its vicinity. The Project would not conflict with any habitat conservation plan.

4.11 Mineral Resources

a) Will the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

The Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There are no known mineral resources of regional value located on or near the Project area.

b) Will the Project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local General Plan, specific plan, or other land use plan?

The Project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local General Plan, specific plan, or other land use plan. The Project area is not identified in the General Plan Minerals Element as containing a locally-important mineral resource. In addition, the Project area is not designated as a mineral resource zone by the Shasta County Zoning ordinance.

4.12 Noise

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels? c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

The noise level performance standards for new projects, per the Shasta County General Plan (Shasta County 2004) includes the following limits.

- 50 A-weighted decibels (dBA) at the property line of noise-sensitive uses between the nighttime hours of 10:00 p.m. and 7:00 a.m.
- 55 dBA at the property line of noise-sensitive uses between the evening hours of 7:00 p.m. and 10:00 p.m.

The construction of the Project may cause short-term but unavoidable noise impacts depending on the construction activity being performed and the distance to receiver. Noise will also be emitted by turbines during operation. Noise-sensitive land uses in the vicinity of the Project area comprise residences on Haines Road west of Burney and residences and campsites in the Moose Camp area.

The Applicant will prepare a Noise Technical Report to evaluate construction and operational noise associated with the Project and consistent with Shasta County standards. This report will establish a baseline noise level for the Project site, predict Project-based noise levels at adjacent property lines, assess potential impacts, and outline mitigation scenarios that could be implemented to reduce potential impacts. To characterize the existing noise environment, long-term, 24-hour, unattended noise level measurements will be made at up to 5 locations continuously over a 5-day period. Monitoring equipment will be located at sensitive receptors – which could include occupied buildings, parks, and adjacent property lines – in order to accurately assess the site's existing short-term and long-term noise levels.

Sound levels from the operation of the turbines will be predicted for the nearest property boundary for daytime and nighttime conditions using the "Cadna/A" software program developed by DataKustik, GmbH (Munich). This modeling tool allows the site terrain to be accurately recreated in three dimensions and wind/atmospheric effects on sound propagation to be evaluated as needed. Results will be shown in detailed sound level contour maps and tables will be developed that include the noise level predicted at the property line of the nearby noise receptor locations.

The collected baseline ambient sound level data and the turbine sound level contribution predicted by modeling will be used to determine whether there is potential for exposure of persons to noise level in excess of Shasta County noise standards. as well as exposure of persons to excessive ground borne vibration or noise levels. The technical report will be completed by Q2, 2018.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose

people residing or working in the Project area to excessive noise levels? f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the Project area to excessive noise levels?

The Project is not located within an airport land use plan, within two miles of a public airport, or in the vicinity of a private airstrip.

4.13 Population and Housing

a) Will the Project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Project does not propose any new homes or new public roads and population growth would not occur as a result of the Project.

b) Will the Project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

The Project would not displace existing housing because the Project will be constructed on private timber lands used for timber production.

c) Will the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The Project would not displace people because the Project will be constructed on private timber lands used for timber production.

4.14 Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

a) Fire Protection?

The Project area is located in a "Very High Fire Hazard Severity Zone" according to Figure FS-1 in the Shasta County General Plan (Shasta County 2004). The Project could increase the potential for wildfires associated with the use of vehicles and electrical equipment and increased human presence during construction of the Project. Sparks from vehicles and construction equipment, heated mufflers, spark producing construction activities such as welding, and improper disposal of matches or cigarettes, for example, could start a fire. There would also be increased presence and use of petroleum products, including oils and lubricants onsite, thereby increasing the potential for fires.

The Project will develop and implement an FPP prior to construction and operation. The FPP will include emergency response and evacuation procedures that would include immediate notification of local fire agencies. Staff would be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. These measures may include, but are not limited to equipping earthmoving and portable equipment with internal combustion engines with spark arrestors, requiring vehicles to carry fire suppression equipment when onsite such as fire extinguishers, flappers, and shovels, and storing fire suppression tools at designated locations within the wind farm. Fire breaks will also be maintained around Project facilities including the turbines, substation, and O&M facility (per Public Resource Code 4290).With implementation of the FPP, the impacts to the Project related to wildfires during the O&M phase are anticipated to be very low. The risk of fire is further minimized by the design features of the turbines as fire prevention features will be incorporated within the turbines. Additionally, access roads would serve as fire breaks and would provide access for fire suppression activities.

b) Police Protection?

The Project is located on private timber lands owned by Oxbow Timber I, LLC and the turbine sites will be accessed existing via private logging roads and proposed access roads accessed via the private logging roads. Public access to the turbine sites will be restricted to avoid potential safety hazards per the Project's approved Access Control Plan. All turbine towers will be locked as well as the O&M facility. The substation will be fenced and locked to prevent unauthorized entry. These precautionary measures would minimize the need for police surveillance and response. During construction, when opportunity for theft is high, security will be on site at all times when active construction is not occurring.

c) Parks? d) Other public facilities?

Population growth would not occur as a result of the Project therefore demands on local parks districts and school districts are not expected to change in direct correlation to this Project.

4.15 Recreation

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Population growth would not occur as a result of the Project therefore use of existing local or regional parks or other recreational facilities are not expected to change or increase.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The Project does not propose any new or expanded recreational facilities. In addition, the Project area is not located on public land or otherwise designated as open space or recreational land nor does it have formal public access for recreation.

4.16 Transportation/Traffic

a) Will the Project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)? b) Will the Project exceed, whether individually or cumulatively, a level of service standard established by the County congestion management agency for designated roads or highway?

Temporary increases in traffic due to Project construction have the potential to degrade the level of service (LOS) on public roadways in the Project's transportation and traffic study area. The Applicant will conduct a traffic impact analysis by fourth quarter 2017. The traffic impact analysis will examine existing traffic volumes and LOS on roadways and increases in congestion at intersections within the Project study area. See Section 5.1 for more information on the Traffic Assessment Report.

c) Will the Project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

There are four publicly operated airports in Shasta County: Fall River Mills Airport, Shingletown Airport, Redding Municipal Airport, and Benton Field. The Project area is no more than 14.5 miles from the closest airport. The Project area is not within an airport protection area. The Project would not result in changes to air traffic patterns. An FAA determination of no hazard will be requested.

d) Will the Project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Safety hazards may increase due to construction-generated traffic such as trucks entering and existing State route 299. Potential for increases in safety hazards from construction traffic will be examined in the Traffic Assessment Report. In addition, any safety hazards that result from construction related traffic can be mitigated through the development and implementation of a Traffic Control Plan in accordance with County and Caltrans policies.

e) Will the Project result in inadequate emergency access?

Emergency access to the Project area could be affected by Project construction—specifically, road closures, detours, and construction-related traffic could delay or obstruct the movement of emergency vehicles. This impact is considered potentially significant, but implementation of a Traffic Control Plan would reduce this impact. The construction of new access roads will also provide more access for emergency vehicles to access the Project site.

f) Will the Project result in inadequate parking capacity?

Parking needs generated by construction workers and heavy construction equipment would be accommodated within the Project site.

g) Will the Project conflict with adopted policies, plans or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?

Project would not conflict with adopted policies, plans or programs supporting alternative transportation.

4.17 Utilities and Service Systems

a) Will the Project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Construction of the Project would generate a minor amount of wastewater from portable toilets, which will be provided and serviced on a contracted basis. The construction contractor will dispose of sanitary wastewater pursuant to applicable regulations. Wastewater from the O&M building during operation of the Project will be processed using an on-site septic system. This system would conform to all County design standards and specifications to avoid impacts on ground- or surface waters.

b) Will the Project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction of the Project would require water for dust control, equipment washdown, wetting of concrete, emergency fire suppression, and other activities. During construction, the contractor would arrange for delivery of water to the site by water trucks from a source with an existing water right. Water for the operations and maintenance facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Wastewater from the O&M facility will be processed using an on-site septic system. Because the Project will not connect to any water or wastewater treatment facilities, there would be no impact on the capacity of an existing water or wastewater treatment facilities.

c) Will the Project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Prior to obtaining a grading permit for the Project, the construction contractor will confirm storm water runoff requirements and, if necessary, incorporate storm water control measures such as seepage pits, drywells, and/or detention basins. Permanent storm water control structures would be installed to prevent erosion where access roads, buildings, storage areas, and parking areas are constructed.

Impermeable surfaces created by the Project would be limited to the concrete tower foundations, substation, and O&M facilities. Access roads, laydown areas, and staging areas will be gravel and therefore permeable. The Project is not anticipated to significantly increase the amount of storm water runoff and would not alter existing drainage patters. Therefore, environmental impacts from construction of new storm water drainage facilities would be minimal.

d) Will the Project have sufficient water supplies available to serve the project which serves or may serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Construction of the entire Project would require water for dust control, equipment washdown, batching concrete, emergency fire suppression, and other activities. During construction, water will either be provided from an onsite water well or the contractor would arrange for delivery of water to the site by water trucks from a source with an existing water right.

Water for the operations and maintenance facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Any efforts to install a domestic well would be conducted in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. The Applicant anticipates that less than 5,000 gallons of water will be used per day for operations and maintenance. Construction of a domestic well and groundwater use for operation would only occur if the Applicant determines groundwater is available in the Project area and

sufficient to support the Project's uses. It is unlikely the Project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

The Project would not require the acquisition or expansion of entitlements and there would be no need to develop infrastructure to connect to an existing water supply distribution facility.

e) Will the Project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the prover's existing commitments?

Wastewater from the O&M facility will be processed using an on-site septic system. Because the Project will not connect to any wastewater treatment facilities, there would be no impact on the capacity of an existing wastewater treatment facility.

f) Will the Project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

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. and disposed of at the Burney Transfer Station and ultimately the Anderson Landfill or recycled with applicable and feasible. A low volume of waste associated with the Project is anticipated and there would be no need to increase the Anderson Landfill capacity.

g) Will the Project comply with Federal, State, and local statues and regulations related to solid waste?

The Project will comply with Federal, State, and local statues and regulations related to solid waste

5.0 Description of Technical Studies/Surveys to be Conducted

5.1 Traffic Assessment Report

A Traffic Assessment Report will be prepared using traffic and transportation evaluation methodology consistent with the Shasta County Circulation Element of the General Plan, as well as Caltrans guidelines. Existing traffic and transportation conditions of the Project area, including the traffic volumes along State Route 299 will be examined. This includes a review of current daily, peak hour and truck traffic volumes to the east and west of the access roads along State Route 299. PWD will assess the operation and performance of the existing roadways using the procedures from the Highway Capacity Manual (HCM2010 or HCM 6, as required). This analysis will provide LOS based on vehicular delay and calculate percent time-spent-following slower vehicles. Other existing conditions that will be analyzed include roadway hazards, non-motorized transportation, transit service, rail service and air traffic operations.

Construction trip generation and distribution will be based on the workforce projected for the site and their respective locations of residence or lodging. Construction delivery routes will also be

assessed. Likewise, trip generation and distribution will be evaluated during normal operation once the construction phase is complete and the wind project is placed online.

For construction and operations-related traffic, PWD will detail impacts and propose mitigation measures, including:

- Increases in traffic volumes and degradation in levels of service;
- Increases in safety hazards;
- Interference with emergency access and circulation; and,
- Inadequate parking supply to meet the parking demand.

A construction traffic control plan will be developed and implemented to deal with these issues.

5.2 Viewshed Analysis, Visual Simulations, and Assessment of Potential Effects to Visual Resources

A viewshed analysis will be completed to identify locations within the analysis area from which the Project would potentially be visible. The viewshed analysis for the Project will use the preliminary Project layout and a U.S. Geological Survey digital elevation model dataset. The analysis results will identify all points on the terrain surface with a direct line of sight to the tip elevation of one or more Project turbines. Because the turbines are the tallest structures of the proposed Project and are typically sited along ridges to maximize the wind resource, the turbines are generally the most prominent Project facilities and the most likely to be visible. However, it should be noted that the viewshed analysis results will be a conservative representation of potential Project visibility. The analysis represents line-of-sight conditions based only on topography; it does not account for factors that might obscure or block visibility from a specific location or at certain times, such as weather conditions, existing structures, or vegetation.

The viewshed analysis will, along with desktop review of aerial photographs, land use and resource plans, land use data, and the public scoping comments for the Project, serve as a basis for identification of preliminary viewpoints for eventual use in the production of visual simulations. Preliminary viewpoints will be field verified to ensure site visibility and representation with regard to sensitive viewers in the project vicinity, which include residents, recreationists using trails and other facilities within the project viewshed, and roadway travelers. Analysis of up to seven viewpoints in the evaluation of potential effects to visual resources is anticipated. Such viewpoints typically afford direct line-of-site to proposed project facilities and as such are often in locations where views are no more than partially obstructed by topography or intervening vegetation.

The viewshed analysis and evaluation of potential impacts to visual resources will initiate in the fourth quarter of 2017.

5.3 Biological Surveys

The principal objectives of biological resource studies are to: 1) conduct a review of existing data on biological resources present or that may occur at the Project in order to provide a preliminary evaluation of the site; 2) evaluate avian use of the Project area including small birds, large birds,

and eagles specifically; 3) locate and describe raptor nests in the Project and surrounding area that may be subject to disturbance and/or displacement effects from facility construction and/or operation; 4) estimate seasonal bat use of the Project area; 5) examine potential occurrence of California sensitive species within the Project area; and 6) produce a desktop assessment of wetlands and waters within the Project area. Additional information regarding species that are present or may occur in the vicinity of the Project will be gathered through appropriate agency correspondence and from reports developed for other local or regional projects. This information will be used in final impact analyses where applicable. An initial meeting to discuss biological resource studies with the USFWS, CA Department of Fish and Wildlife, Shasta County, and the Applicant is occurred in June 2017.

5.3.1 Site Characterization Study

Recommendations in the WEG (USFWS 2012) call for tiered wind energy project development that includes: Tier 1 – Preliminary Site Evaluation, Tier 2 – Site Characterization, and Tier 3 – Field Studies to Document Site Wildlife and Habitat and Predict Project Impacts. Part of addressing Tiers 1 and 2 includes analysis of existing data sources to determine potential species occurrence at a project. These species may include both wildlife and plants. Special focus is given to species which are state or federally listed as threatened or endangered, or to species that are otherwise considered sensitive by regulatory agencies or non-governmental organizations. Additional site characterization work under the WEG includes identifying and evaluating habitat within project boundaries such as land cover types. The SCS will include a preliminary evaluation of the Project site area that addresses the following key objectives:

- Presence of habitat for species of concern at the landscape level;
- Potential for presence of plant and wildlife species of concern on the Project;
- Potential occurrence of areas that may be precluded from development;
- Potential presence of plant communities on the Project that may provide habitat for wildlife species of concern; and
- Potential areas of wildlife concentration within the Project.

The SCS report will be based primarily on a desktop evaluation of the Project area using accessible resources including both publicly available data (e.g., California Native Plant Society data, California Natural Diversity Database [CNDDB] data), as well as privately held data that may be available from past surveys conducted by the landowner and/or lessee. The Applicant's survey contractor will conduct a reconnaissance-level site visit to evaluate current site conditions at the Project relative to that derived from desktop review. Any state or federally listed, or sensitive plants or wildlife observed during the site visit will be documented and locations will be recorded for later inclusion in the SCS report. The Draft SCS report was prepared during the third quarter of 2017.

5.3.2 Baseline Wildlife Studies

Baseline wildlife studies at the Project will address use by eagles (bald eagles [*Haliaeetus leucocephalus*] and golden eagles [*Aquila chrysaetos*]), non-eagle raptors (e.g., *Buteo* hawks) and other large birds (e.g., waterfowl), small birds (e.g., passerines) and bats. This work will rely on data gathered during surveys at the Project. However, an initial desktop assessment of bat species that have the potential to occur at the Project area will also be conducted and will help inform follow-up field studies. Following this initial assessment, bat use of the Project will be evaluated through acoustic surveys in 2017. Finally, should the need arise based on information gathered during the initial site visit, and through consultation with the landowner biologist and agency representatives, sensitive species surveys for both wildlife and plants may be conducted.

A draft Biological Survey Report will be completed within two months of survey effort completion. However, a preliminary results memo can be provided to Shasta County by the end of 2017. The draft Biological Survey Report will include a discussion of the methods, results, and potential Project impacts based on the results of avian point-count surveys, raptor nest surveys, and bat acoustic surveys. The full draft Biological Survey Report covering the first year of surveys is anticipated to be available for incorporation into CEQA documents by third quarter, 2018.

Sensitive Species Surveys

Sensitive Species Surveys may be conducted to examine occurrence of California sensitive plant and animals species within the Project area, pending consultation with agency representatives and landowner biologists. Should sensitive species surveys be deemed necessary, data collected from these efforts will be included in the Biological Survey Report. In addition, if sensitive species surveys are conducted, a Sensitive Species Memo will be prepared after completion of surveys and will be provided to Shasta County within one month.

Eagle Use Surveys

Eagle use (including Bald eagles [*Haliaeetus leucocephalus*] and golden eagles [*Aquila chrysaetos*]) in the study area will be determined through direct observation. Following guidelines in the USFWS Eagle Conservation Plan Guidance (ECPG; USFWS 2013, USFWS 2016), as well as recommendations in the WEG, the Applicant's biological survey contractor will initiate a two-year study of eagle use in the Project beginning in April 2017. Surveys will be conducted weekly at half the survey stations, such that each station is surveyed twice per month. A Eagle Use Survey Report will be available by fourth quarter 2018.

Baseline Avian Point-Count Surveys

In addition to the eagle use surveys described above, surveys aimed at evaluating small bird use of the Project area will also be conducted. The ECPG recommends conducting studies of this sort separately from eagle or large bird use surveys to increase detection probability. Assessment of small bird use of the Project area is important as it may allow identification of any previously

unknown occurrence of sensitive species, identification of high use periods (e.g., migration windows, breeding seasons), or areas within the larger Project area that may be particularly important to small birds (e.g., reproductive habitats, stopover sites).

Avian point-count surveys will occur from approximately mid-April through June during the spring, and from September through November during the fall. Two years of surveys, conducted during vernal and autumnal migration windows, will begin in April 2017. Completion of this effort will result in data for inclusion in a draft Biological Survey Report, which will be available by first quarter 2018.

Raptor Nest Surveys

The tiered development approach defined in the WEG includes numerous recommendations for Tier 3 studies, as mentioned previously. The WEG and ECPG not only recommend utilizing surveys for eagles and raptors, as outlined in the previous section, but also suggests that project developers engage in raptor nest surveys if there is potential for the Project to impact breeding raptors, which is the case throughout western North America (USFWS 2012, 2013). The Applicant's survey contractor will conduct aerial raptor nest surveys within and in areas surrounding the Project for two breeding seasons (2017 and 2018). Breeding season varies by species and geographic location, but generally includes February through July in northern California. In addition to the Project area, a 2-mile buffer surrounding the Project will be surveyed for raptor nests, and a 10-mile buffer will be surveyed for eagle nests.

A draft Nest Survey Memo will be provided to Shasta County after completion of the final nest survey each year (third quarter 2017 and 2018). Data from the raptor nest surveys will also be included in the aforementioned Biological Survey Report.

Bat Desktop Assessment

An assessment of bat use, or potential use, of the Project area will be conducted through a desktop analysis of existing resources to determine the possible species of bat which may occur within the Project area. This desktop assessment will draw upon publicly available resources such as the CNDDB, and Bat Conservation International Species Profiles, which are sortable by state and include known range information. Additional consultation with the landowner biologist or agency representatives may be used to inform this assessment, where applicable. This effort will include a description of habitats for particular bat species at the Project, and will result in the production of a list of species that may occur at the Project and the possible timing of occurrence for these species. Because many bat species are migratory, it is possible that some species may only be present during brief migratory windows, or may use habitat within the Project area as maternity sites or hibernacula. Particular focus will be given to the potential for occurrence of state or federally listed, candidate, or sensitive species.

The result of this desktop assessment will be a draft Bat Desktop Assessment Report, available fourth quarter of 2017.

Bat Acoustic Surveys

As part of Tier 3 baseline biological studies, passive bat acoustic monitoring will be conducted. The WEG suggest utilizing passive acoustic monitoring to assess bat use as it is a practical method of determining whether or not threatened, endangered or otherwise sensitive species are utilizing a Project area (USFWS 2012). Bat acoustic monitoring devices will be deployed at the Project area from May 1 through November 15, 2017. Data from these surveys will be included in the Biological Survey Report, a draft of which will be prepared by first quarter 2018. This report will include a description of the methods, results, and a discussion of potential Project impacts on bats determined to be using the Project area. In addition, data on detector locations will included in the Biological Survey Report.

Nocturnal Bird Migration Surveys

A review was conducted of local, regional, and nation-wide radar studies at sites proposed for wind energy development, including the adjacent Hatchet Ridge wind energy facility (Tetra Tech 2013). Results indicated that the majority of spring and fall nocturnal migrants fly at heights well above the rotor swept zone of commercial wind turbines. Additionally, radar has not been demonstrated to be a reliable predictor of collision risk at proposed wind energy sites. Based on an analysis of 15 seasonal nocturnal migration studies conducted at wind energy sites between 1999 and 2009, no correlation was found between pre-construction passage rates and flight heights, and post-construction fatality estimates (Tidhar et al. 2010a). Because radar has been demonstrated to provide limited data relating to risk assessments and operational results from the adjacent operating wind project indicating limited impacts to nocturnal migrants, a nocturnal avian migration survey will not be conducted at the Project.

5.3.3 Project Area Desktop Assessment of Wetlands and Waters

Waters protected under the CWA are considered jurisdictional, and must be defined through a formal delineation process. The Applicant's survey contractor will conduct a desktop assessment of the waters, including wetlands, at the Project, in order to inform a future field delineation of jurisdictional waters. The Applicant's survey contractor will communicate with the USACE, if necessary, in an effort to determine the potential occurrence of jurisdictional waters at the Project, and will also consult available public information sources such as the NWI, which is operated by the USFWS. Additional resources may include examination of aerial imagery or USGS topographic maps.

The desktop assessment will result in a Wetlands and Waters Memo. GIS files developed for the Wetlands and Waters memo will also be provided. The Memo and data will be available by the first quarter of 2018.

5.3.4 Additional Studies

The following studies are also being considered and will be prepared by the Applicant as warranted by environmental review and/or agency coordination:

- Noise Technical Report. Evaluation of potential construction noise associated with the Project consistent with Shasta County standards, if warranted by environmental review. No noise monitoring during construction is anticipated. If blasting is required during construction, noise monitoring protocols will be established and implemented.

- Phase 1 Cultural Resources Report. Will be prepared in a manner consistent with Section 106 of the 1966 National Historic Preservation Act regarding the identification and protection of significant cultural resources, as well as state and county guidelines, and will include relevant information from consultation with Native American tribes.

- Economic Impact Analysis. Conducted in accordance with Shasta County standards.

5.3.5 Anticipated Timing of Studies

Table 5-1 lists the studies described above and provides estimated timing for the completion of each.

Table 5-1. Summary of Studies and Estimated Timing.

Study		Estimated Timing
Traffic Assessment Report		Spring 2018
Visual Resources Technical Report		Fall-Winter 2017-2018
Biological Surveys and Related Studies		
	Site Characterization Study	Fall 2017
	Biological Survey Report	Preliminary Results – 1Q 2017 Draft – 3Q 2018
	Eagle Use Survey Report	Draft – 4Q 2018
	Nest Survey Memo	Results provided – 4Q 2017 and 3Q 2018
	Bat Desktop Assessment Report	Draft – 4Q 2017
Wetlands and Waters Memorandum		Q1 2018
Noise Technical Report		2Q 2018
Phase 1 Cultural Resources Report		2Q2018
Economic Impact Analysis		2Q 2018

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FIGURES

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APPENDIX A: Desktop Geotechnical Report

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