FOUNTAIN WIND PROJECT

Staff Assessment

SCH # 2023110139

CALIFORNIA
ENERGY COMMISSION
Gavin Newsom,
Governor

March 2025
CEC-700-2024-007-SA

DOCKET NUMBER 23-OPT-01

STAFF ASSESSMENT

Fountain Wind Project

(23-OPT-01)

Lead Agency

California Energy Commission

March 2025

Table of Contents

Section 1

Executive Summary

1 Executive Summary

Introduction

This Staff Assessment (SA) which includes a Draft Environmental Impact Report (EIR) has been prepared by the California Energy Commission (CEC) staff to evaluate the potential environmental effects of the construction and operation of the Fountain Wind Project (Fountain Wind or project) (23-OPT-01), in compliance with the California Environmental Quality Act (CEQA), the CEQA Guidelines, the Warren-Alquist State Energy Resources Conservation and Development Act, and California Code of Regulations, title 20, chapter 5, article 4.1 (Opt-In Certification Program). The SA also evaluates whether the construction and operation of the project would conform with all applicable local, state, and federal laws, ordinances, regulations, and standards (LORS).

The applicant is seeking a certification from the CEC to construct and operate the Fountain Wind Project. Fountain Wind is a proposed wind energy generation facility on approximately 2,855 acres of private, leased working forest land in unincorporated Shasta County, California, near the town of Burney. More complete project details are set forth in **Section 3, Project Description**.

As described in Section 1.2.1 of this Executive Summary, staff recommends the CEC deny the project application.

1.1 CEC's Project Application Review History

This SA contains CEC staff's independent and objective evaluation of the proposed project and examines engineering, environmental, public health and safety, and environmental justice impacts of the proposed project, and compliance with additional statutory provisions, based on the information provided by the applicant, government agencies, interested parties, independent research, and other sources available at the time the SA was prepared.

Between January 3, 2023, and January 11, 2023, the applicant filed its application for the Fountain Wind Project (CEC docket 23-OPT-01). Consistent with Public Resources Code section 25545.4, CEC staff reviewed the application materials within 30 days and on February 10, 2023, the CEC's Executive Director notified the applicant that the application was incomplete, identifying numerous specific informational deficiencies required under California Code of Regulations, title 20, section 1877. Over the following eight months, the applicant submitted in batches the deficient information. On October 30, 2023, staff determined the supplemental information required to complete the application was acceptable and issued a Determination of Completeness signed by CEC's Executive Director.

With the application complete, staff met the procedural requirements of Public Resources Code sections 25545.7.2 and 25545.7.4 by issuing a notice of preparation of

an EIR on November 2, 2023, holding a public informational and scoping meeting in Shasta County on November 28, 2023, and notifying the relevant tribes of the application and inviting consultation.

Following the completeness determination, staff learned in December of 2023 through its independent research that the applicant's source of water for construction and operations was not viable and the applicant would need to supplement project information once a new water source was identified. On March 18, 2024, the applicant provided supplemental information on water resources that substantially changed the circumstances under which the project was undertaken and implicated the potential for additional and novel environmental impacts. On March 28, 2024, CEC notified the applicant and the public, through a docketed letter to applicant, that the project's changes in water source, filing of supplemental information and the need for additional information on the new water supply, resulted in the project no longer being subject to the 270-day timeline to reach a decision on an application as authorized under Public Resources Code section 25545.4(e)(2). The additional time necessary to reach a decision on the application also extended the 150-day period set forth in California Code of Regulations, title 20, section 1879, to issue a draft EIR. Further filings by the applicant on May 15, 2024, and June 27, 2024, demonstrated continuing changes to the water supply scenario, and continued to warrant re-evaluation of environmental impacts.

1.2 Summary of Engineering Evaluation, Environmental Impact Assessment, Conditions of Certification, and LORS Conformance

Below and throughout the balance of this document, is an overview of the analysis included in **Section 5, Environmental Setting, Environmental Impacts and Mitigation.** Impacts are categorized by the type of impact as follows:

- *No Impact.* The scenario in which no adverse changes to (or impacts on) the environment would be expected.
- *Less Than Significant Impact.* An impact that would not exceed the defined significance criteria or would be eliminated or reduced to a less than significant level through implementation of the applicant's project measures and/or compliance with existing federal, state, and local laws and regulations.
- *Less Than Significant with Mitigation Incorporated.* An impact that would be reduced to a less than significant level through implementation of the identified mitigation requirements.
- *Significant and Unavoidable Impact.* An adverse effect that meets the significance criteria, but there appears to be no feasible mitigation available that would reduce the impact to a less than significant level. In some cases, mitigation may be available to lessen a given impact, but the residual effects of that impact would continue to be significant even after implementation of the mitigation measure(s).

Table 1-1 summarizes the engineering evaluation and environmental impacts and consequences of the project, including mitigation proposed and the project's compliance with laws, ordinances, regulations, and standards (LORS).

TABLE 1-1 SUMMARY OF ENGINEERING EVALUATION AND ENVIRONMENTAL IMPACTS AND LORS COMPLIANCE

Technical Area	Conforms with LORS?	Impacts Mitigated?
Engineering Design		
Facility Design	Yes	N/A
Facility Efficiency and Energy Resources	Yes	N/A
Facility Reliability	N/A	N/A
Transmission System Engineering	Yes	N/A
Worker Safety and Fire Protection	Yes, pending permits per Public Resources Code section 25545.1(b)(2)	N/A
Environmental Impact Assessment		
Air Quality	Yes	Yes
Biological Resources	No	No (Sig/Un)
Climate Change and Greenhouse Gas Emissions	Yes	Yes
Cultural and Tribal Cultural Resources	Yes	No (Sig/Un)
Forestry Resources	No	No (Sig/Un)
Geology, Paleontology and Minerals	Yes	Yes
Hazards, Hazardous Materials/Waste, and Wildfire	No	No (Sig/Un)
Land Use and Agriculture	No	No (Sig/Un)
Noise and Vibration	Yes	Yes
Public Health	Yes	Yes
Socioeconomics	Yes	Yes
Solid Waste Management	Yes	Yes
Transmission Line Safety and Nuisance	Yes	Yes
Transportation	Yes	Yes
Visual Resources	No	No (Sig/Un)
Water Resources	Yes, permits pending per PRC 25545.1(b)(2)	Impact Unknown
Public Benefits	N/A	N/A
Environmental Justice	N/A	N/A

Notes: Sig/Un = Significant and Unavoidable; N/A = not applicable (technical area not subject to CEQA consideration or has no applicable LORS the project must conform with).

1.2.1 Conditions of Certification, Environmental Impact Assessment, and LORS Conformance

The proposed facility has multiple significant and unavoidable impacts on the environment in the areas of Biological Resources; Cultural and Tribal Cultural Resources; Forestry Resources; Hazards, Hazardous Materials, and Wildfire; Land Use and Agriculture; and Visual Resources. In addition, the project conflicts with three local laws or ordinances regarding the allowable uses of the proposed project site.

The CEC cannot certify a project under the Opt-In Program that conflicts with local laws and ordinances unless the CEC determines the project is needed for public convenience and necessity, and no more prudent and feasible alternative exists to meet that public convenience and necessity. Additionally, to approve the project under CEQA the CEC must find that the specific economic, legal, social, technological, or other benefits of the project outweigh its unavoidable environmental impacts. These determinations require specific findings regarding benefits of the project, supported by substantial evidence.

As set forth in detail in **Section 11, Override Findings and Recommendations**, staff recommends the CEC find (1) the project is not necessary for public convenience and necessity and that a battery energy storage system would be a more prudent and feasible alternative and (2) the project benefits do not outweigh its unavoidable environmental impacts. These recommendations are based on the unavoidable environmental impacts taken as a whole, the public safety and general welfare purposes of the local land use ordinances, and the net contribution to the environment and protection from climate change provided by the local laws and ordinances not being outweighed by the project's relatively small contributions to the energy needs of the state and the modest potential economic interests to the local community.

Staff considered the competing state policies of preserving our natural environment, especially forested working lands that contribute to carbon sequestration, against the amount the project contributes to the mandated policy in Senate Bill (SB) 100 to reduce greenhouse gas emissions and their effects on climate change. Even so, staff sets forth the evidence and policies herein and has concluded that this project's benefits are not sufficient to impose the multiple significant burdens that would be the true cost of this project, especially in light of a reasonable alternative that also meets the objectives of the project. Staff acknowledges the key role wind generation plays in SB 100 goals, but concludes the evidence is clear that this location is not compatible with this proposed facility. Staff provides the analysis in detail only to resolve this application before CEC in its unique setting. The following summarizes staff's conclusions.

Air Quality. *Less Than Significant with Mitigation Incorporated.* With implementation of Air Quality conditions of certification (COCs), potential identified air emissions from the project, including criteria pollutants during construction, including from portable equipment such as concrete batch plants, and wind energy generation facility

operation, including occasional use of the emergency generator, would have a less than significant impact, and the project would conform with all applicable LORS.

Biological Resources. *Significant and Unavoidable Impact.* Although construction related impacts would be less than significant with the implementation of staff's COCs; operation of the project would result in significant and unavoidable impacts to birds and bats from collision with the wind turbines. In addition, because the project would impair aerial firefighting, should a fire start on or near the project site it has the potential to result in substantial impacts to biological and aquatic resources on the project site and surrounding region including the adjacent National Forest Lands. Even with the implementation of staff's proposed COCs, many of the project's impacts to biological resources would remain significant and unavoidable and would not conform with most applicable LORS.

Climate Change and Greenhouse Gas Emissions. *Less Than Significant Impact.* The project would lead to a net reduction in greenhouse gas emissions across the State's electricity system, and the greenhouse gas emissions related to the project would not conflict with any plans, policies, or regulations adopted for the purpose of reducing the emissions of greenhouse gases (applicable LORS). The project would therefore have less than significant greenhouse gas-related impacts to the environment.

Cultural and Tribal Cultural Resources. *Significant and Unavoidable Impact.* The project would have significant and unavoidable impacts to cultural and tribal cultural resources, related to visual impacts to an identified historical resource and an identified tribal cultural landscape, but would conform with applicable LORS. With implementation of staff's proposed COCs, many of the proposed project's impacts on cultural and tribal cultural resources would be less than significant or reduced to the extent possible. However, significant and unmitigable impacts to cultural and tribal cultural resources would remain.

Forestry Resources. *Significant and Unavoidable Impact.* The proposed project would result in the permanent conversion of forest resources that are classified as Site Class I (high productivity) and II (intermediate productivity), which represents a significant and unavoidable impact. The project would not conform with applicable LORS which are intended to preserve lands within a timber production (TP) district. There is no feasible mitigation that would bring the proposed project into conformance with a TP district.

Geology, Paleontology, and Minerals. *Less Than Significant with Mitigation Incorporated.* The impacts of applicable geologic hazards would be mitigated to less than significant through project design and construction, based on the results of a site-specific geotechnical investigation, the California Building Code (applicable LORS), and implementation of staff's proposed COCs. Potential impacts to paleontological resources would be less than significant because the project footprint is underlain by volcanic rocks with low to no potential for paleontological resources. Potential impacts to

geologic and mineral resources would be less than significant because these resources are not expected to be encountered during project construction.

Hazards, Hazardous Materials, and Wildfire. *Significant and Unavoidable Impact*. The proposed project wind turbines would introduce an impediment to aerial firefighting which would present a significant and unavoidable impact to wildfire emergency response. Implementation of staff's proposed COCs would reduce impacts related to wildfire emergency response to the extent feasible; however, a significant and unavoidable impact would remain. With implementation of staff's proposed COCs, the proposed project would conform with applicable LORS and have less than significant impacts related to hazards, hazardous materials and wildfire, except for impacts related to wildfire emergency response and nonconformance with Section 17.88.135 of the Shasta County Municipal Code.

Land Use and Agriculture. *Significant and Unavoidable Impact.* The proposed project would have a less-than-significant impact associated with division of an established community, and no agricultural land conversion impacts. However, the project would not conform with applicable LORS prohibiting a large wind energy system within an unincorporated area of Shasta County. There is no feasible mitigation that would bring the proposed project into conformance with the County's municipal code.

Noise and Vibration. *Less Than Significant with Mitigation Incorporated.* Despite the generation of noise louder than ambient levels, such as from rock blasting, helicopter operation, and other construction activities, with the implementation of staff's recommended COCs, the project's construction and operation would have a less than significant impact related to noise and vibration and would conform with applicable LORS.

Public Health. *Less Than Significant Impact.* With implementation of Air Quality COCs, the project would conform with all applicable LORS. Public health impacts of the project would be less than significant.

Socioeconomics. *Less Than Significant Impact.* The construction and operation of Fountain Wind would have a less than significant impact related to socioeconomics. Staff's proposed COCs would ensure conformance with LORS.

Solid Waste Management. *Less Than Significant Impact.* Solid waste produced during project construction and operation would be recycled to the extent possible or otherwise disposed at certified local landfills with available capacity. Therefore, wastes generated by the proposed project, including those sent to landfills, as well as materials handled by third party waste disposal resulting from construction and operation of the project would have a less than significant impact and would conform with applicable LORS.

Transmission Line Safety and Nuisance. *Less Than Significant with Mitigation Incorporated.* With implementation of staff's recommended COCs, potential hazards and impacts to receptors associated with transmission lines and related structures and facilities for the project would have a less than significant impact related to transmission line safety and nuisance and would conform with applicable LORS.

Transportation. *Less Than Significant with Mitigation Incorporated.* Implementation of staff's recommended COCs to mitigate impacts associated with project ingress and egress and transport of materials to the project that exceed weight, height, and length limits by applying roadway improvements and obtaining all mandatory permits from state and local agencies would reduce impacts of the project to less than significant. Impacts related to transportation would conform with applicable LORS.

Visual Resources. *Significant and Unavoidable Impact.* Project components exceeding 200 feet tall would be required by the Federal Aviation Administration (FAA) to install lighting and be marked (e.g., a distinguishing color). The emission of new artificial light from the installation of FAA approved air navigation and obstruction lighting systems on 50-plus structures on the project site would be a *significant effect on the environment*. In addition, the light trespass on surrounding properties created by the FAA-required lighting would have a *significant effect on the environment*.

Also, the color, form, texture, scale, and motion by the wind turbines, other structures, and equipment for the project would adversely affect a "scenic vista" and have a *significant effect on the environment.* The project is inconsistent with the Shasta County Scenic Highways Element and Figure SH-1, objectives and policies in the Shasta County Timberlands Element, and use and requirements in the Timberland Production Zone.

Finally, the project would substantially degrade the existing the visual character or quality of public view of site and its surroundings from key observation points 4 and 5 creating a *significant impact on the environment*. None of these impacts can be mitigated or avoided. In addition, the project would be in nonconformance with the county Scenic Highways Element, Timberlands Element, and the Timberland Production Zone.

Water Resources. *Less Than Significant with Mitigation Incorporated. Impact Unknown as to the use of onsite wells for operational water supply.* Impacts due to stormwater runoff would be mitigated by adherence to staff's proposed COCs both during construction and operation. Impacts of discharges to land due to the conversion of timber land would also be addressed by compliance with staff's proposed COCs. Adherence to state and local permit requirements per Public Resources Code section 25545.1(b)(2) would mitigate potential impacts to waterways and wetlands and potential impacts of an onsite wastewater treatment system.

Environmental Justice. The following technical areas discuss project-related impacts on environmental justice (EJ) populations: Air Quality; Cultural and Tribal Cultural

Resources; Hazards, Hazardous Materials and Wildfire; Noise and Vibration; Public Health; Solid Waste Management; Transportation; Visual Resources; and Water Resources. Impacts of three of these technical areas (Cultural and Tribal Cultural Resources; Hazards, Hazardous Materials and Wildfire; and Visual Resources) would result in disproportionate effects on the EJ populations represented in **Section 6, Environmental Justice, Figure 6-2**, **Figure 6-3**, and **Table 6-2**.

1.2.2 Engineering Evaluation and LORS Conformance

Facility Design. Staff concludes that the design and construction of the project, including the wind turbines and linear facilities would conform with the applicable LORS. In addition, staff-proposed COCs include measures to ensure conformance with applicable LORS.

Efficiency and Energy Resources. Energy consumed by Fountain Wind would not create significant adverse effects on energy supplies or resources, nor would it consume energy in a wasteful or inefficient manner. Furthermore, through energy-efficient design and increased renewable electricity generation, the project would neither conflict with nor obstruct state or local plans (applicable LORS) for renewable energy or energy efficiency and, therefore, would have no impact on those plans.

Facility Reliability. Fountain Wind would be built to operate in a manner consistent with industry norms for reliable operation and would be expected to demonstrate an equivalent availability factor of 98 percent, which is an acceptable level of availability. The proposed project would perform reliably and would not adversely affect project reliability.

Transmission System Engineering. With implementation of staff's COCs, the project would have a less than significant impact related to transmission system engineering and would conform with applicable LORS.

Worker Safety and Fire Protection. Staff concludes that with the proposed COCs worker safety and fire protection impacts would be less than significant and the project would conform with applicable LORS.

1.3 Cumulative Scenario

See **Appendix 1** of this document for a discussion on the staff's methodology of assessing cumulative impacts and a list of existing and reasonably foreseeable projects staff used to analyze cumulative impacts and a figure showing their location, where possible (see **Table 1-2** and **Figure 1-1** in **Appendix 1**).

1.4 Summary of Alternatives to the Project

Staff evaluated three alternatives that were found to be potentially feasible and that could avoid or reduce the proposed project's potentially significant impacts:

- No Project/No Build Alternative
- Reduced Project Alternative
- Battery Energy Storage System Alternative

Only the Battery Energy Storage System (BESS) Alternative was determined by staff to avoid or substantially lessen significant effects of the proposed project while achieving the project's basic objectives. The smaller construction and operation footprint required for this alternative would result in less severe impacts for the following issue areas: Biological Resources; Cultural Resources; Forestry Resources; Hazards, Hazardous Materials, and Wildfire; Land Use and Agriculture; Visual Resources; and Water Resources. A BESS Alternative would avoid the proposed project's significant and unavoidable impacts for four issue areas (Biological Resources, Forestry Resources, Land Use and Agriculture, and Visual Resources). This alternative would also be consistent with State and local LORS. The BESS Alternative was identified by staff as the CEQA Environmentally Superior Alternative because it would reduce the severity of many of the proposed project's impacts while achieving the basic objectives of the project.

1.5 Summary of Net Economic Benefits

Public Resources Code section 25545.9 requires that the CEC find that the construction or operation of the facility will have an overall net positive economic benefit to the local government that would have had permitting authority over the site and related facility before CEC may approve a project. The Fountain Wind applicant provided forecasts of gross economic benefits from Fountain Wind construction and operations. As Public Resources Code section 25545.9 requires a net economic analysis, staff estimated gross economic costs to subtract from the gross economic benefits to get net economic benefits. See **Section 10, Mandatory Opt-In Findings** for a detailed net economic analysis.

In estimating Fountain Wind potential net economic benefits, staff created three scenarios, base case, high fire risk, and stress case, to account for uncertainty in potential future positive and negative economic impacts. The three cases staff created to estimate gross negative economic impacts and net economic benefits provide a range of outcomes that account for uncertainty in potential negative economic impacts, including from wildfire risk.

For construction, all three scenarios (base case, high fire risk, and stress case) show positive net economic benefits in all categories- jobs, value added, and economic output. The net economic benefit estimates decrease as staff assume higher negative economic impacts but are always positive.

For the operations phase, the base case and high fire risk case show net positive economic benefits for all categories. The stress case shows net positive benefits for all categories as well but are about half of the base scenario values. The stress case

assumes loss of timberlands production, increased wildfire mitigation and prevention costs, and increased wildfire damages and costs to the county from the project's construction and operations phases.

Based on the analysis, staff expects Fountain Wind to produce positive net economic benefits for Shasta County under a range of future conditions. If the negative economic impacts from reduced timberlands production and increased fire mitigation costs are much higher than expected, and if the gross economic benefits from Fountain Wind are much lower than expected, then the project could produce negative net economic benefits.

Section 2

Introduction

2 Introduction

2.1 Purpose of the Staff Assessment

The purpose of this Staff Assessment (SA) is to provide objective information regarding the project's significant effects on the environment, identify possible ways to minimize the significant effects, describe reasonable alternatives to the project, assess the project's conformance with applicable local, state, and federal laws, ordinances, regulations, and standards, and provide an evaluation of the extent to which the application complies with additional licensing requirements set forth in the Public Resources Code. This information will be considered by the California Energy Commission (CEC) Commissioners in deciding whether to grant a certificate to build and operate the project. The SA is based on information from the applicant, site visits, independent staff research, consultation with other agencies, public comment, and relevant information received during any public meetings, all of which are available through the docket as of the date of the publication of this document.

2.2 Energy Commission Jurisdiction and the Opt-In Certification Program

In 2022, Assembly Bill (AB) 205 established a new Opt-In Certification Program for eligible non-fossil-fueled power plants, energy storage, and manufacturing and assembly facilities to optionally seek certification through the CEC. Upon an applicant filing with the CEC, Public Resources Code sections 25545 and 25545.1 authorize the CEC to certify or approve the construction and operation of the following facilities:

- solar photovoltaic and terrestrial wind energy powerplants of 50 MW or more
- energy storage facilities of 200 megawatt-hours (MWh) or more
- the electric transmission lines from these generation and storage facilities to the first point of interconnection with the existing transmission grid
- facilities that manufacture or assemble clean energy or storage technologies or their components with a capital investment of at least $250 million
- thermal powerplants of 50 MW or more that do not use fossil or nuclear fuels
- hydrogen production facility (not derived from fossil fuel feedstock) and associated onsite storage and processing facilities

AB 205 authorizes the CEC to accept applications for these facilities through June 30, 2029, and provides a streamlined process for their review and a decision by the CEC. The CEC is the "lead agency" under the California Environmental Quality Act and is required to prepare an environmental impact report (EIR) for any facility that elects to opt-in to the CEC's jurisdiction. With exceptions, including for the State Water Resources Control Board or applicable regional board, the issuance of a certificate by the CEC for an eligible facility is in lieu of any permit, certificate, or similar document

required by any state, local, or regional agency, or federal agency to the extent permitted by federal law, and supersedes any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law.

This SA consists of a draft environmental impact report following the requirements of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) and the CEQA Guidelines (Cal. Code of Regs., tit. 14, div. 6, ch. 3) and a separate analysis considering whether the project meets the following statutory requirements:

(1) The extent to which the applicant has complied with the recommended minimum standards of efficiency adopted under Public Resources Code section 25402(d).

(2) The conformity of the facility with public safety standards and the applicable air and water quality standards, and with other applicable local, regional, state, and federal standards, ordinances, or laws and a statement of efforts made to correct or eliminate any noncompliance.

(3) The potential for restoring the site as necessary to protect the environment if the commission denies approval of the application.

(4) The public benefits from the project including, but not limited to, economic benefits, environmental benefits, and electricity reliability benefits.

(5) An identification of whether the site is located at a prohibited area as identified in Public Resources Code sections 25526 and 25527 and any proposed findings relevant to that location.

(6) The overall net positive economic benefit to the local government that would have had permitting authority over the site and related facility. Economic benefits may include, but are not limited to, employment growth, housing development, infrastructure and environmental improvements, assistance to public schools and education, assistance to public safety agencies and departments, property taxes, and sales and use tax revenues.

(7) Any legally binding and enforceable agreements by the applicant with, or that benefit, a coalition of one or more community-based organizations, such as workforce development and training organizations, labor unions, social justice advocates, local governmental entities, California Native American tribes, or other organizations that represent community interests, where there is mutual benefit to the parties to the agreement. Concurrent with the publication of the updated Staff Assessment, the executive director shall file a recommendation on whether the commission shall certify the environmental impact report and issue a certificate for construction and operation of the facility.

(8) For expedited judicial review, the project satisfies the conditions in Chapter 6.5 (commencing with Section 21178) of Division 13, including Sections 21183 and 21183.6, of the Public Resources Code.

The SA is circulated for agency and public review as follows: distribution through the CEQA State Clearinghouse to state agencies, direct mail to local, state and federal agencies, property owners and occupants adjacent to the project site and property owners within 1,000 feet of the project site and 500 feet of project linears, posted to the project's CEC docket, and distributed via email to those on the project's subscription list. The subscription list is an automated CEC system by which information about this proceeding is emailed to persons who have subscribed.

Following the publication of the SA, Public Resources Code, Chapter 6.2, Section 25545.7.6 implements a 60-day public review and comment period on the SA, as well as a requirement that a public workshop be held during this time. For projects staff is recommending approval, comments received during this period, and any changes to the SA, will be incorporated into an Updated Staff Assessment and presented to the CEC at a public business meeting. If the project is approved, a Notice of Determination is filed with the State Clearinghouse.

2.3 Agency Coordination

CEC staff closely coordinates with other expert agencies to ensure the conditions those agencies would impose on the project if those agencies were issuing permits are incorporated into the CEC's certification.

To facilitate this coordination, staff provided notification of the receipt of the opt-in application to California Department of Fish and Wildlife, State Water Resources Control Board, Regional Water Quality Control Board, Department of Toxic Substances Control and other state, regional, and local agencies (such as Shasta County Department of Resource Management). Notification of the receipt of the opt-in application was also provided to the California Public Utilities Commission and California Attorney General.

Consistent with California Code of Regulations, Title 14, Section 15082 and Public Resources Code Chapter 6.2, Section 25545.7.2(a), on November 2, 2023, staff issued a Notice of Preparation of a Draft EIR, filing it with the Office of Land Use and Climate Innovation (formally Office of Planning and Research) (State Clearinghouse), responsible and trustee agencies, and the county clerk.

The mailing list used to engage with stakeholder agencies can be found in **Appendix 2**.

2.4 Consultation with Tribes

CEC staff sent letters to California Native American tribes on a Native American Heritage Commission (NAHC) list of tribes identified as having cultural affiliation in the project vicinity and interested in consulting on development projects in the project area. Following receipt of the NAHC response to the CEC solicitation on February 7, 2023, letters were mailed to 10 individuals on November 3, 2023, consistent with Public Resources Code, Chapter 6.2, Section 25545.7.4. The letters invited the tribes to

comment on the proposed project and offered to hold face-to-face consultation meetings if any were requested. CEC staff received the following responses/requests:

- Pit River Tribe responded via letter on November 2, 2023.

The CEC staff responded by email on November 21, 2023, asking for a date and time to initiate consultation. On January 11, 2023, consultation was initiated between the CEC staff and the Pit River Tribe.

The Pit River Tribe and CEC staff held four consultation meetings over Zoom on January 11, July 29, August 26, and September 19, 2024. Participants included the chairman of the Pit River Tribe, tribal historic preservation officers, representatives of several bands of the Pit River Tribe, tribal elders, legal representatives for the Tribe and CEC staff, CEC staff consultant Aspen Environmental Group, the CEC's tribal liaison, and CEC's assistant tribal liaison/Cultural Resources Unit supervisor for the Siting, Transmission, and Environmental Protection Division. As of the date of publication of this Staff Assessment, staff has not received any additional responses. More detail on CEC staff's consultation efforts with California Native American tribes can be found in **Section 5.4, Cultural and Tribal Cultural Resources**.

2.5 Public Outreach and Notification

The CEC's public outreach program is primarily facilitated by the CEC's Office of the Public Advisor, Energy Equity, and Tribal Affairs (PAO+). The PAO+ outreach consisted of email outreach to elected officials, California Native American tribes, community and other organizations, businesses, schools, labor unions and trade associations, community centers, local residents, and others that had previously expressed interest in being informed of proposed project review and other activities through County events, outreach, and engagement. This is an ongoing process, and efforts are discussed in greater detail in the **Section 6, Environmental Justice** section of this SA.

To initiate public awareness of the project, a summary of the project was published in a newspaper of general circulation in the county of the project site. The summary was published in the Redding Searchlight on February 28, 2023.

Consistent with Public Resources Code, Chapter 6.2, Section 25545.7.2, staff held a Joint Environmental Scoping and Informational Meeting on November 28, 2023 in Anderson, California and via remote access to solicit input on the application to identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in the EIR. As described above, staff distributed a Notice of Availability of the SA (including Draft EIR) to agency and public review, distributed to property owners and occupants adjacent to the project site and property owners within

1,000 feet of the project site and 500 feet of project linears, posted to the project's CEC docket, and distributed to those on the project's subscription list.

A public meeting held after publication of the SA also must be noticed and conducted as close as practicable to the proposed site, consistent with Public Resources Code, Chapter 6.2, Section 25545.7.6(a).

The relevant mailing lists staff used for outreach can be found in **Appendix 2**.

2.6 Organization of this Staff Assessment

The SA is prepared to conform to the requirements of CEQA, the CEQA Guidelines (California Code of Regulations, title 14, section 15000 et seq.), the Warren-Alquist Act (Public Resources Code, section 25000 et seq.), and CEC's siting regulations (California Code of Regulations, title 20, sections 1875-1881).

This Staff Assessment is organized into 12 sections, as described below:

- Section 1 Executive Summary. This section provides an overview of the proposed project; the environmental impacts that would result from the proposed project; conditions of certification identified to reduce or eliminate these impacts; a list of cumulative projects (in **Appendix 1**); project alternatives; and net economic benefits to local government.
- Section 2 Introduction. This section describes the CEC's authority and function of the SA; the environmental review process; and the organization of the SA.
- Section 3 Project Description. This section summarizes the proposed project, including the location of the site and project boundaries, characteristics of the proposed project, objectives sought by the proposed project, and intended use of this environmental document.
- Section 4 Engineering Evaluation. This section evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. Staff's engineering evaluation is broken down into the following topics:
    - Efficiency and Energy Resources
    - Facility Design
    - Facility Reliability
    - Transmission Line Safety and Nuisance
    - Transmission System Engineering
    - Worker Safety and Fire Protection
- Section 5 Environmental Setting, Environmental Impacts and Mitigation. This section includes the environmental setting; regulatory background; approach to analysis; project-specific and cumulative impacts; and mitigation measures (referred to as Conditions of Certification), when appropriate. Staff evaluates the potential environmental impacts that might reasonably be anticipated to result from construction and operation of the proposed project. Staff's analysis is broken down into the following environmental resource topics derived from CEQA Appendix G:

- Air Quality
- Biological Resources
- Climate Change and Greenhouse Gas Emissions
- Cultural and Tribal Cultural Resources
- Forestry Resources
- Geology, Paleontology, and Minerals
- Hazards, Hazardous Materials/Waste, and Wildfire
- Land Use and Agriculture
- Public Health
- Socioeconomics
- Solid Waste Management
- Transportation
- Visual Resources
- Water Resources

For each subject area, the analysis includes a description of the existing conditions and setting related to the subject area, an analysis of the proposed project's potential environmental impacts, and a discussion of mitigation measures and conditions of certification, if necessary, to reduce potentially significant impacts to less than significant levels and ensure conformance with LORS.

- Section 6 Environmental Justice. This section includes an analysis of how the project would potentially impact an Environmental Justice[1] population.
- Section 7 Public Benefits. This section includes a discussion of any public benefits from the project including, but not limited to, economic benefits, environmental benefits, and electricity reliability benefits.
- Section 8 Alternatives. This section includes a discussion of a reasonable range of alternatives to the proposed project, or to the location of the project, which could feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and an evaluation of the comparative merits of the alternatives. This section also includes an evaluation of the no project alternative.
- Section 9 Compliance Conditions and Compliance Monitoring Plan (Compliance Plan). The Compliance Plan contains the means for ensuring all aspects of construction, operation and closure comply with LORS and with conditions/mitigations adopted by the CEC.
- Section 10 Mandatory Opt-In Regulations. This section includes a discussion of the project's conformance with the mandatory requirements for an Opt-In project.
- Section 11 Override Findings and Recommendations. This section includes a discussion of the significant and unavoidable impacts of the project and laws, ordinances, regulations or standards (LORS) the project is not in conformance with.
- Section 12 Authors and Reviewers. This section includes a list of the authors and reviewers for this SA.

Section 3

Project Description

3 Project Description

Project Overview

The Fountain Wind Project (project) is a wind energy generation development in an unincorporated area of Shasta County. Overall, the project would have a total nameplate generating capacity of up to 205 MW.[1] Associated infrastructure and facilities would include:

- Up to 48 wind turbine generators, approximately 610 feet tall, rising above the existing tree canopy;
- 34.5-kilovolt (kV) overhead and underground electrical collector system;
- an on-site substation to receive electricity from the turbines via the electrical collector system;
- overhead and underground fiber-optic communication lines and/or a microwave relay system;
- an onsite switching station to connect the project to the existing regional grid operated by the Pacific Gas and Electric Company (PG&E);
- a temporary 10-acre construction and equipment laydown area;
- up to nine (9) temporary 2-acre laydown areas distributed throughout the project site to store and stage building materials and equipment;
- up to three (3) permanent meteorological evaluation towers (METs);
- temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET locations);
- two (2) storage sheds;
- up to three (3) temporary five (5) acre concrete batch plants; and
- an operation and maintenance (O&M) facility with employee parking, including a septic system and a new operational water supply well
- Over 500 acres of permanent forest clearing and conversion of forested working lands

New access roads would be constructed within the project site, and existing roads would be widened. See **Figures 3-1**, **3-2a** and **3-2b**, which show the project region and proposed layout of project components. The project would operate year-round.

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

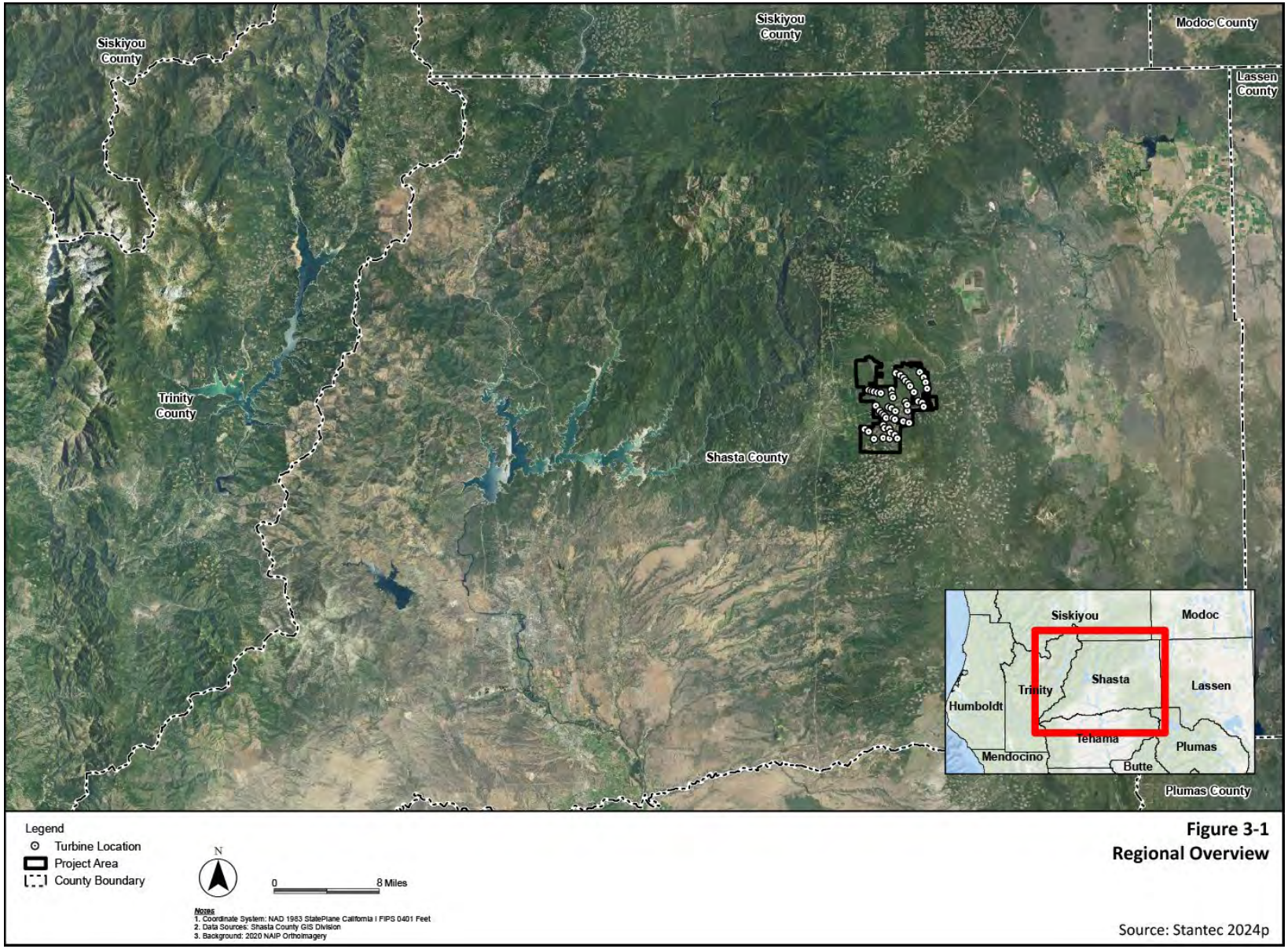


Figure 3-1
Regional Overview

Source: Stantec 2024p

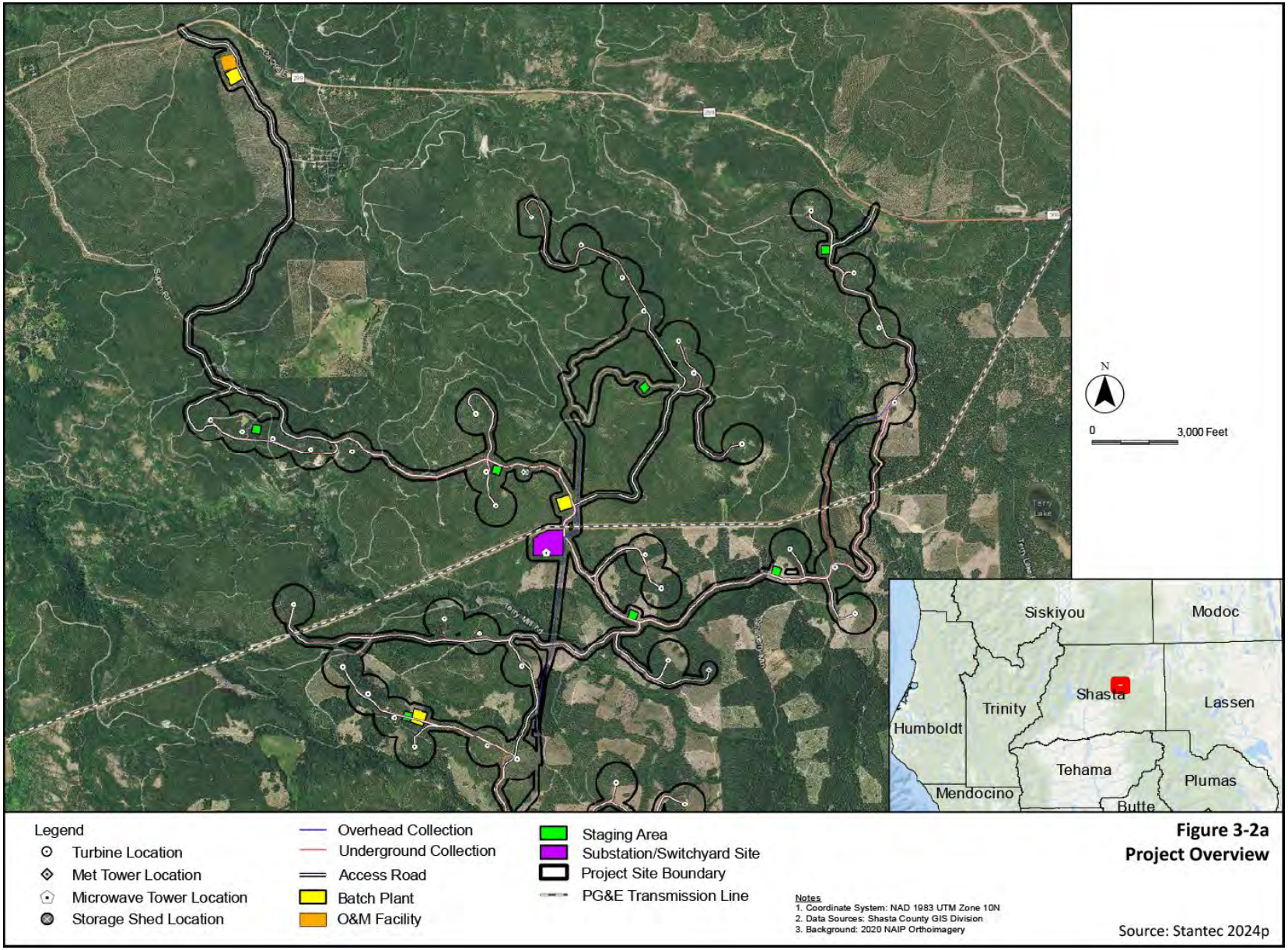


Figure 3-2a
Project Overview

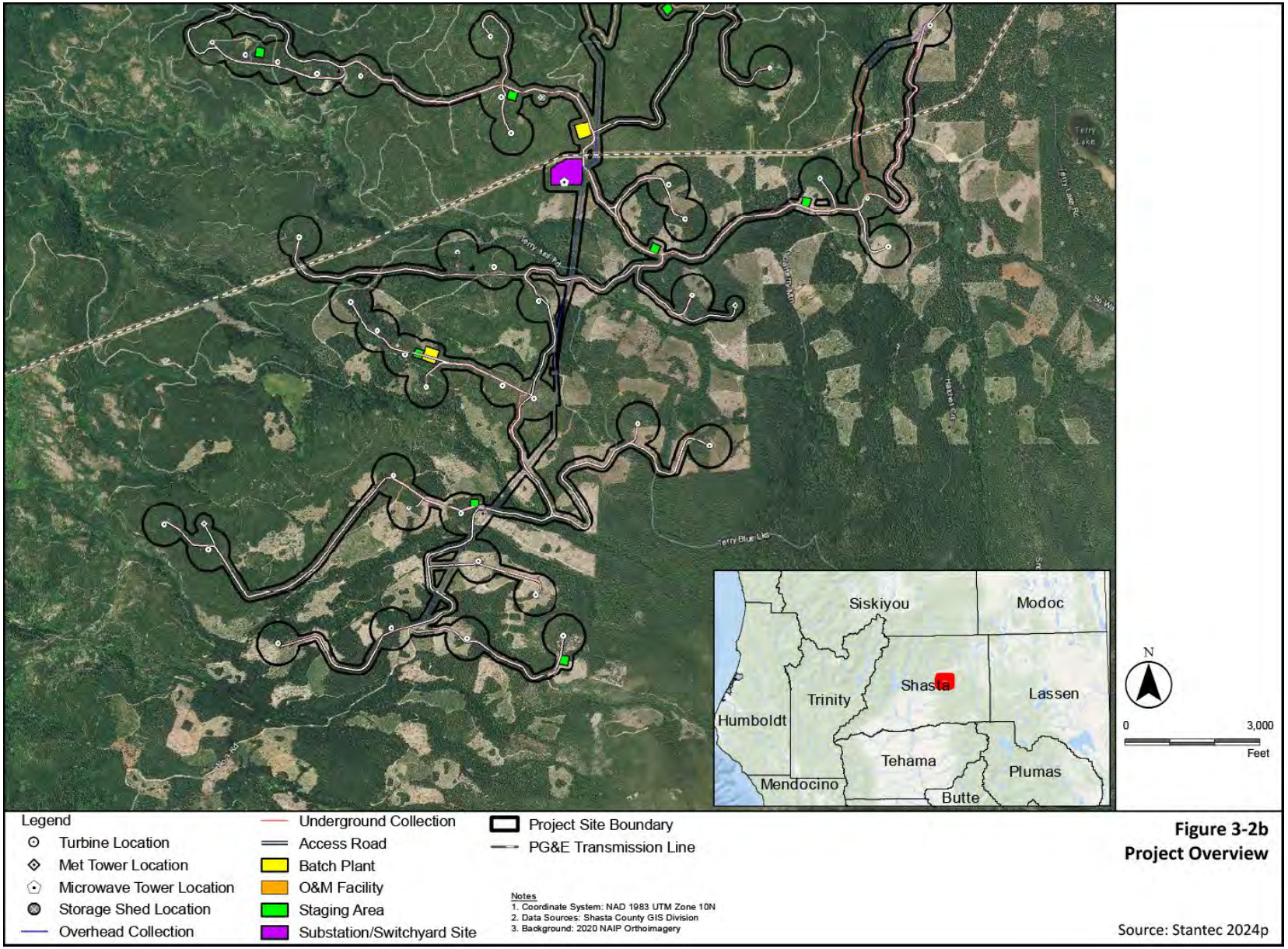


Figure 3-2b
Project Overview

Source: Stantec 2024p

Project Location

The project site is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, and immediately south of State Route (SR) 299. Other communities near the project site include Montgomery Creek, Round Mountain, Wengler, and Big Bend. Access to the project site would be provided locally by SR 299 via two existing, gated, private logging roads, and would be provided regionally by highways that provide access to SR 299, including Interstate 5, which is approximately 35 miles to the west of the project site, and SR 139, which is approximately 60 miles to the east of the project site. The assessor's parcel numbers associated with the project are included in **Table 3-1**.

TABLE 3-1 PROJECT SITE ASSESSOR PARCEL NUMBERS

02713004600	027220001000	029190013000	029210009000	029250010000	030080014000
027140028000	029170006000	029190014000	029210019000	030080005000	034010003000
027160020000	029170008000	029190016000	029210020000	030080006000	034010004000
027160027000	029190010000	029190017000	029210021000	030080007000	034010008000
027160047000	029190011000	029200043000	029220006000	030080008000	034010016000
027160049000	029190012000	029210001000	029250001000	030080013000	034010017000
027210006000					

The project site is located within the southern end of the Cascade Range with topography characterized by buttes and peaks separated by small valleys. The Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned. The private lands are zoned for timber production purposes. Elevations within the project site range from 3,000 to 6,000 feet above sea level. Little Cow Creek and the south fork of Montgomery Creek cross the project site from east to west. Other small tributaries run through the valleys. Northern portions of the project site were affected by the 1992 Fountain Fire as evidenced by burn scars. The Shasta County General Plan designates the project site's use as Timber (T); the zoning designation is Timber Production (TP) (see **Figure 3-3**). The existing land use within the project site consists exclusively of managed timber lands. Logging roads and transmission lines cross the project site. Moose Camp, an approximately 50-cabin, 146-acre private recreational facility, is located approximately 300 feet east of the main project access road. The project site and surrounding region is the ancestral home of several Bands of the Pit River Tribe whose various members continue to inhabit and utilize its natural features.

3.1 Statement of Project Objectives

As detailed in **Section 8, Alternatives**, the project objectives include the following: Assist California in meeting renewable energy generation or zero carbon targets set forth in Senate Bill (SB) 100 and interconnect to the Northern California electrical grid with available capacity. Benefits of the project are discussed in **Section 7, Public Benefits**.

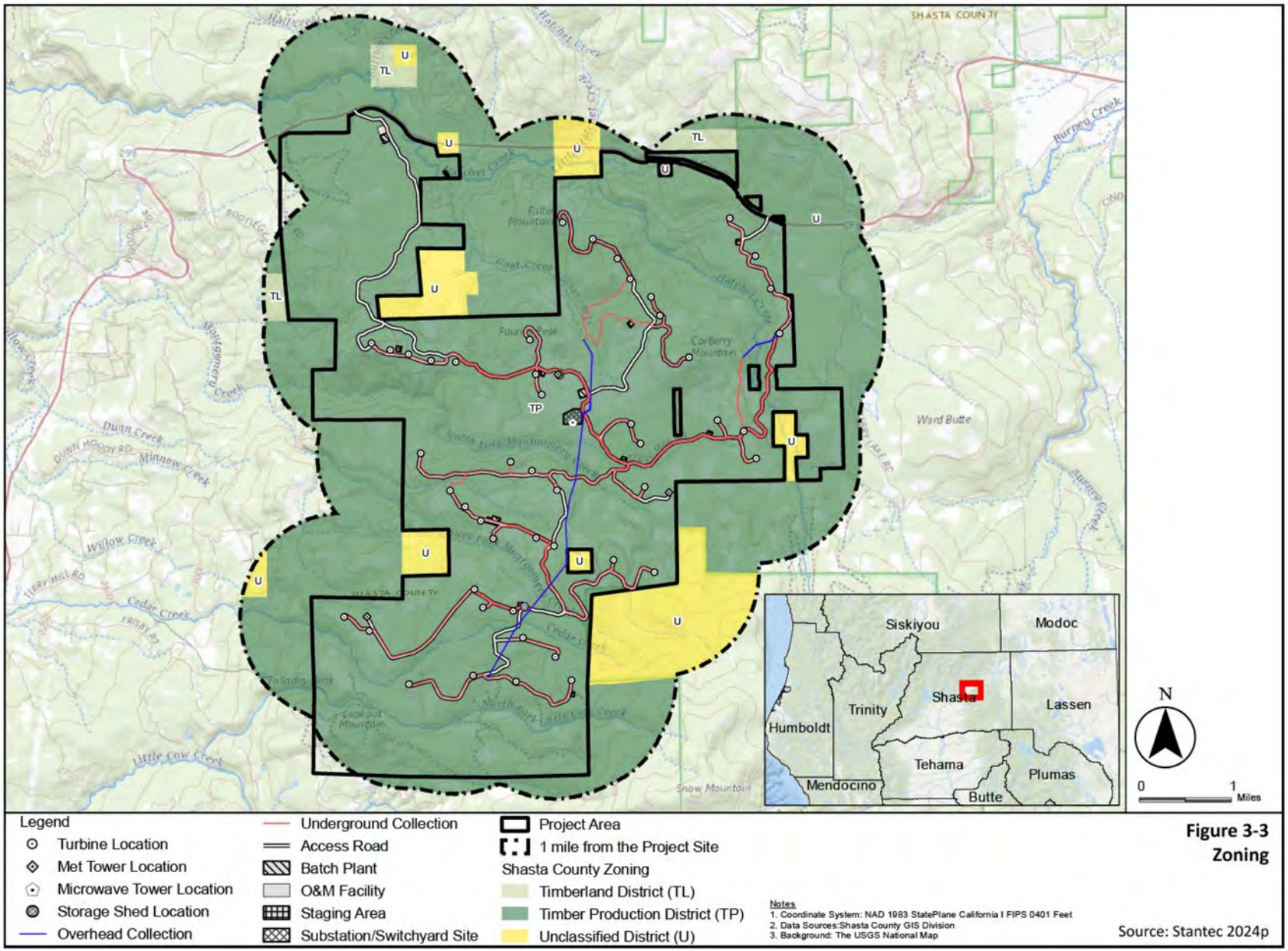


Figure 3-3
Zoning

3.2 Generation Facility, Description, Design, and Operation

The completed project consists of three major components included within the approximately 2,855-acre project site boundary:

- Up to 48 turbines, including associated concrete foundations, pads, and temporary construction areas
- 34.5 kV overhead and underground collector lines and fiber optic communication cabling
- An on-site substation and switching station for connecting the project into the existing PG&E transmission line

The elements of each of these major components are described in more detail in **Tables 3-2** and **3-3** below. Ancillary facilities and infrastructure would also be required, including access roads, temporary construction laydown areas, an operations and maintenance (O&M) facility, up to three (3) permanent METs, two (2) storage sheds, and up to three (3) temporary concrete batch plants.

TABLE 3-2 PROJECT COMPONENTS AND ASSOCIATED IMPACT FOOTPRINTS

Project Component	Quantity	Temporary Impact Description	Permanent Impact Description
Turbines	Up to 48	Approximately 5 acres each (250 ft. radius)	Approximately 2.5 acres each (186 ft. radius)
Access Roads	Up to 19 miles nev and 19 miles widening of existir roads	Up to 200 ft. wide cleared corridor	Up to 40 ft. wide corrido (20 ft. wide drivable surface with up to 10 ft. of cleared area on either side)
Batch Plant	3	Approximately 5 acres each (466 ft. x 466 ft.)	--
O&M Building	1	--	Approximately 5 acres (466 ft. x 466 ft.)
Staging Areas	9	Approximately 2 acres each (295 ft. x 295 ft.)	--
MET Tower	3	Approximately 1.5 acres each (144 ft. radius)	Approximately 0.75 acre each (102 ft. radius)
Underground Collector	Up to 39 miles	Up to 50 ft. wide cleared corridor	Up to 30 ft. wide cleared corridor
Overhead Collector	Up to 6 miles	Up to 100 ft. wide cleared corridor	Up to 80 ft. wide cleared corridor
Substation	1	Approximately 7 acres	Approximately 5 acres
Switching Station	1	Approximately 12 acres	Approximately 8 acres
Microwave Tower [1]	1	--	--
Storage Shed [2]	2	--	--
Water Tanks[3]	3	--	--
Total Disturbance	--	Approximately 548 acres	Approximately 510 acres

Notes:
Because the disturbance footprints of numerous components overlap, total disturbance would not equate to the sum of the disturbance acreage for each component.
1 – the microwave tower would be within the substation / switchyard permanent impact footprint
2 – the storage shed(s) would be within the turbine, MET tower, or access road permanent impact footprints and are anticipated to be approximately 10 feet by 20 feet.
3 – the water tanks would be within the temporary impact footprint of access roads or staging areas; permanent dimensions are similar to those of the storage sheds (10-12 feet in diameter). Water tanks would have a negligible effect on total permanent disturbance.

TABLE 3-3 PROJECT COMPONENT DIMENSIONS

Project Component	Dimensions (approximate)
Turbine	Up to 610 ft.
Nacelle	Height: 13 ft. Width: 21 ft. Length: 42 ft.
Hub[1]	Height: 16 ft. Width: 14 ft. Length: 16 ft. Base to hub height: up to 342 ft.
Blade[1]	Height: 11 ft. Width: 14 ft. Length: 263 ft.
Tower Sections	Height: between 31 and 75 ft. each
MET Tower	Height: up to 394 ft. Width (Base): 30 ft.
Overhead Collector Line Poles	Height: up to 90 ft.
Overhead Collector Line Conductor	Ground clearance: 20 – 30 ft.
Microwave Tower (within Substation)	Area: 25 ft. x 25 ft. Height: 150 ft.
Storage Shed (within turbine, MET tower, or access road permanent impact footprint)	Area: 10 ft. x 20 ft. Height: 10 ft.

Note: 1 Thes represent the maximum potential dimensions for these components

Wind Turbines

Figure 3-2 depicts the 48 turbine sites that are being considered as part of the project. Final design may include fewer than 48 turbine sites. The 48 turbine sites represent feasible locations for a range of turbine models, each with different dimensions, generating capacity, and layout requirements. Prior to construction, the applicant would determine which model would be installed based on component availability from the manufacturer, data on on-site wind resources, and other project-specific factors. Regardless of the model ultimately selected, the project would not exceed the proposed maximum 205 MW nameplate generating capacity.

The project would use up to 7.2 MW, three-bladed, horizontal-axis turbines, meaning the rotor shaft and nacelle, which contains the electrical generator, would be mounted

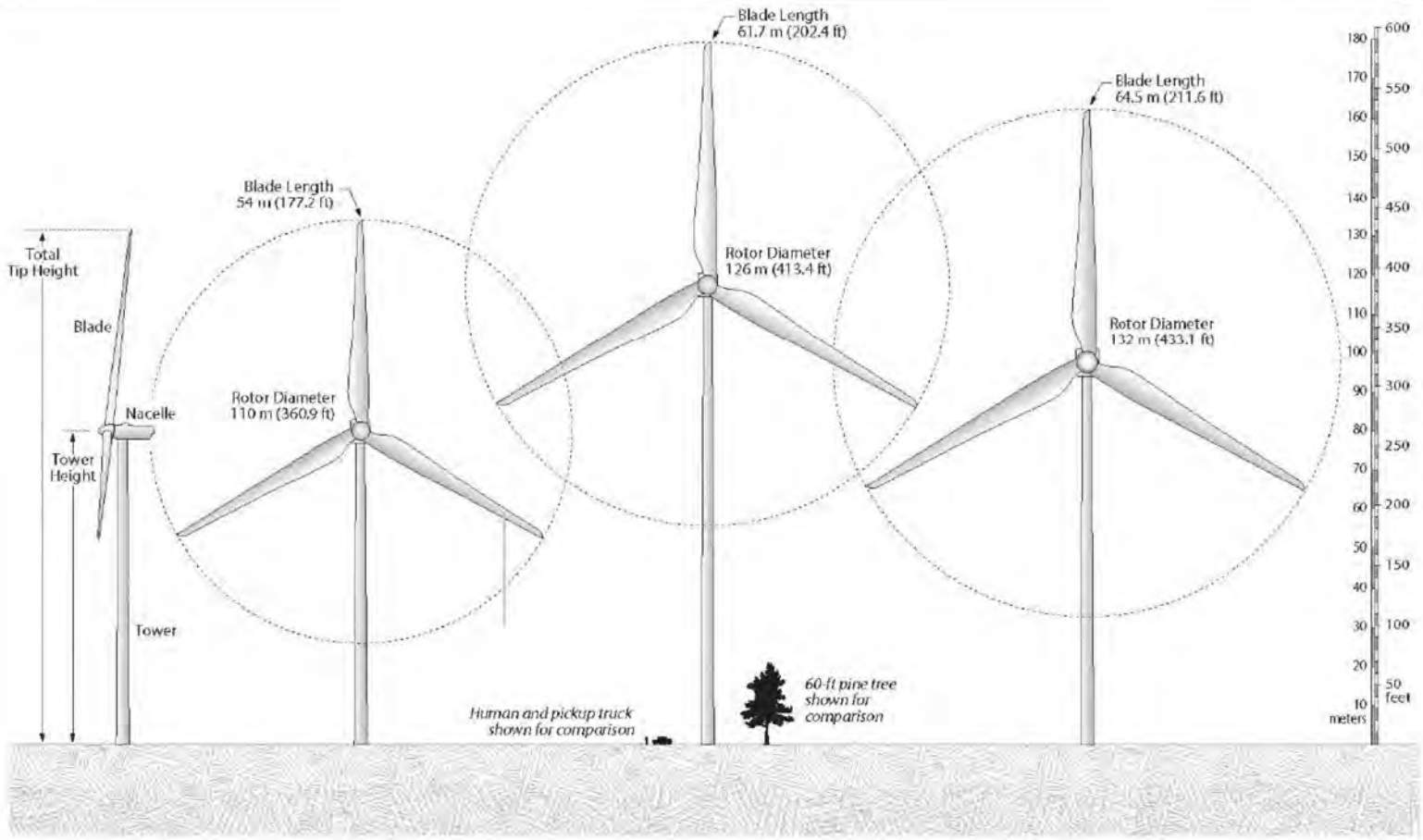
at the top of a cylindrical tower. A range of turbine heights are being considered; however, the maximum possible height would be 610 feet from ground level to the vertical turbine blade tip. Each turbine tower would be mounted on a concrete pedestal supported by a permanent foundation. Representative (non-project-specific) turbine profiles are shown in **Figure 3-4**.

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

Turbine foundations would be designed based on the findings of a project-specific, site-specific geotechnical investigation that would be prepared once final turbine locations have been verified. California Building Code Section 1803 specifies the required content of geotechnical reports. Existing law requires that the geotechnical investigation be conducted by a registered design professional and in accordance with the provisions of California Building Code Section 1803, as may be amended from time to time, and in effect at the time the investigation is conducted. Prior to finalizing the location of each turbine, soil borings would be collected to an approximately 50-foot depth, or as appropriate, to verify soil and rock characteristics and to check that there is sufficient soil strength and bearing capacity to provide a stable foundation for the turbine.

Depending on the final turbine model selected, the widest underground portion of the turbine spread footing foundation would be between 60 and 80 feet in diameter. The aboveground, visible portion of the foundation is anticipated to be similar in diameter to the turbine tower, up to approximately 16 feet in diameter. A step-up transformer would be located either within the turbine nacelle or within a 9-foot by 9-foot reinforced concrete box pad located approximately five feet from the tower foundation.

Designated turbines and METs would have flashing red lights installed that comply with Federal Aviation Administration (FAA) standards and Advisory Circular 70/7460-1L.



Generic Turbine Profile	2.0 MW Turbine	3.45 MW Turbine	3.465 MW Turbine
	Tower height: 80 m (262.5 ft) Total tip height: 135 m (442.9 ft)	Tower height: 117 m (383.9ft) Total tip height: 180 m (590.6 ft)	Tower height: 97 m (318.2ft) Total tip height: 163 m (534.8 ft)

Figure 3-4
Typical Wind Turbine

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

Source: Stantec 2024p

In accordance with these standards, the applicant would prepare a lighting plan for the project and obtain FAA approval that would specify the installation of flashing red lights on designated turbines and METs to improve visibility for aviation. Because the height of the proposed turbines would be greater than 500 feet, it is expected that each would need to be lit with two lights.

During construction, a temporary construction work area of up to approximately five acres would be cleared around each turbine site. This work area would encompass the area needed for grading, foundation excavation and construction, and turbine delivery, assembly, and erection. The final size and configuration of each construction work area would depend on the turbine site's terrain. Each construction work area would generally require a 250-foot by 350-foot designated space for staging the construction crane, which would be used to unload turbine components from delivery trucks and to hoist turbine sections into place during turbine assembly. Within each work area a crane pad would be constructed of compacted soil leveled to approximately two percent slope or less to provide a stable area sufficient to support the weight of the crane during turbine component installation. The size and location of each crane pad would be determined by the final turbine technology that is selected and the requirements for the specific crane that is used for turbine component installation. The crane pad would likely be left in place after construction and used for turbine repair or during decommissioning of the project.

Post-construction, a permanent, 15-foot-wide gravel ring would be placed around the base of the turbine. An area up to approximately 2.5 acres around the turbines would be removed from timber production and will contain low growing vegetation that may periodically be cleared.

3.3 Collection Line Description, Design, and Operation

Electrical Collector System and Communication System

A combination of overhead and underground 34.5 kV electrical collector lines must be built to collect energy generated by the turbines and deliver it to an on-site substation. A communication system also would be installed within the same footprint. The communication system consists of fiber optic communication cabling for Supervisory Control and Data Acquisition (SCADA) system, which provides communication capabilities between turbine locations, substation, and O&M facilities. Most of the collector system would be located underground and adjacent to on-site access roads, requiring excavation and ground disturbance. However, portions of the collector system may be constructed overhead in response to environmental and engineering constraints such as:

- a large distance from generators to the substation;
- meeting the electrical transmission limits of underground cable (20 to 28 MW);
- steep terrain where the use of a backhoe or trenching machine is infeasible or unsafe;

- stream and wetland crossings or cultural resource sites, where an overhead line would avoid or minimize an impact to the resource; or
- the presence of soils with low thermal conductivity or rocky conditions that could significantly increase trenching costs.

See **Figure 3-5**, which shows conceptual design details of the proposed overhead collector system poles.

Underground Collection System

The underground collector system would consist of insulated cables buried in trenches that are 46 inches deep and at least 12 inches wide. Each trench would contain power cables, a ground wire, a fiber optic communication cable, and a marker tape above the cables. Cables generally, though not always, would be co-located with turbine access roads. Road widening will be required in some existing access roads. Where cable trenches cannot be co-located with access roads, a temporary, 50-foot-wide disturbance area would be required to install each cable. During operations, a permanent, 30-foot-wide corridor centered on each buried cable would be maintained clear of woody vegetation. The cables would terminate at individual turbines; the cables would connect from there to junction boxes, overhead power lines, or at the on-site substation. Junction boxes also would be installed on long collector runs between turbine strings. Rocky areas in the project footprint would require blasting as part of the construction of the permanent cable and collector systems.

Overhead Collector System

The 34.5 kV overhead electrical collector system would be installed on wood poles with a maximum height of 90 feet and wire heights between approximately 20 to 30 feet or more above the ground depending on the span (**Figure 3-5**). approximately 100-foot-wide corridor centered on the center line of the overhead line. An approximately 80-foot-wide corridor would be maintained during the operations phase. This area would be kept clear of taller woody vegetation. All overhead collector lines would be designed in accordance with the Avian Protection Plan Guidelines prepared by the United States Fish and Wildlife Service, and the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) guidance for reducing avian electrocution risk and risk of collisions with power lines.

Riser poles used to transition underground lines to overhead collectors would be constructed consistent with APLIC guidance for power pole configurations at wind energy projects. All electrical infrastructure would be built according to relevant state and federal building codes and fire safety requirements.

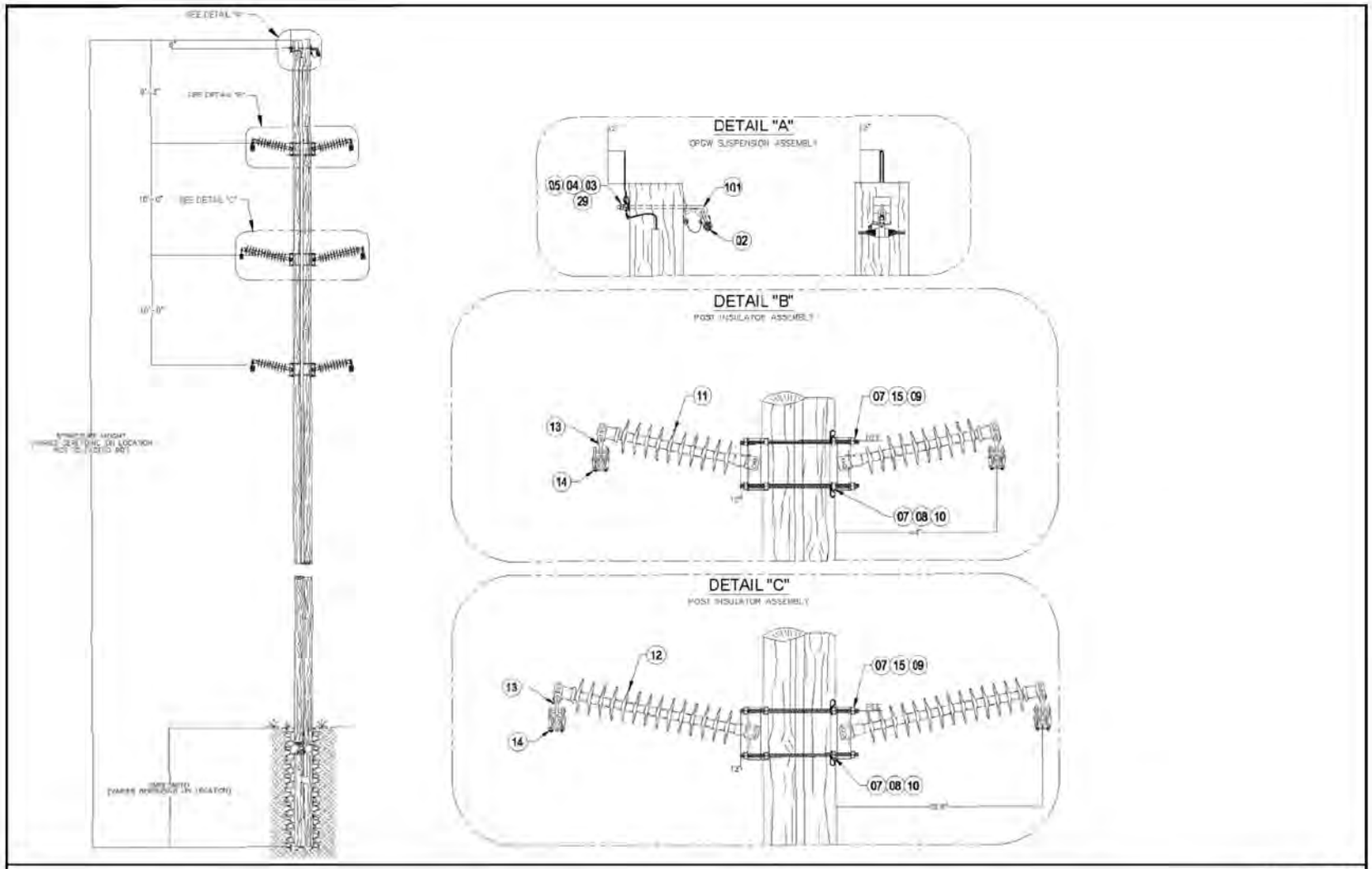


Figure 3-5
Typical Collector Overhead Line Pole

Source: Stantec 2024p

3.4 Project Substation, Switching Station, and Interconnection Facilities

As described above, an on-site substation and switching station would increase the voltage of the electricity from the collection system's 34.5 kV to 230 kV to match the voltage of the existing PG&E 230 kV line. The preliminary substation and switching station designs are depicted in **Figures 3-6** and **3-7**, respectively. The basic elements of the substation facilities include a control house, a bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, a back-up generator, and overhead lightning-suppression conductors. The project substation would require distribution level (i.e., approximately 12 kV) power from the local PG&E distribution grid to provide power the control house. The distribution line is anticipated to run between the O&M building and the substation alongside the access road (up to approximately 5.5 miles) via above ground wooden distribution poles or it could also be installed underground similar to the underground collector system. In the event of a local power outage, the project would utilize a back-up generator to provide power to the control house, which would maintain communications and control of the project. The main outdoor electrical equipment and control enclosure would be installed on concrete foundations. The project substation will be co-located with the switching station, and they would be connected to the grid via an above ground tap line and electrical switch.

The switching station would be located adjacent to the existing PG&E 230 kV Cottonwood-to-Pit 1 transmission line and would facilitate the interconnection between the project's generated electricity and the PG&E transmission lines. To complete the interconnection, a single transmission tower would be removed from PG&E's 230 kV Cottonwood-to-Pit 1 transmission line and replaced with four tubular steel poles approximately 125 feet in height. The 230 kV conductor would be routed to and from the switching station along the four new poles. The applicant would construct the switching station on behalf of PG&E, and PG&E would own and operate the infrastructure upon completion of construction.

Additionally, a relay microwave tower or overhead fiber optic communication circuits could be required. If required, the microwave relay tower would be up to 150 feet tall and would be located within the switching station permanent footprint. The tower would be a self-supporting lattice or lattice mast design and would require either a reinforced concrete slab foundation or a drilled pier foundation. A reinforced concrete slab foundation can be up to approximately 42 inches thick, covering a 25- by-25-foot area. A drilled pier foundation can be approximately 40 feet deep. An antenna system would be mounted on the tower and oriented for optimal communication with PG&E's control and communication system.

Together, construction of the substation, switching station, and interconnection facilities would temporarily disturb up to approximately 19 acres; the permanent area of disturbance would be approximately 5 acres for the collector substation and 8 acres for the switching station.

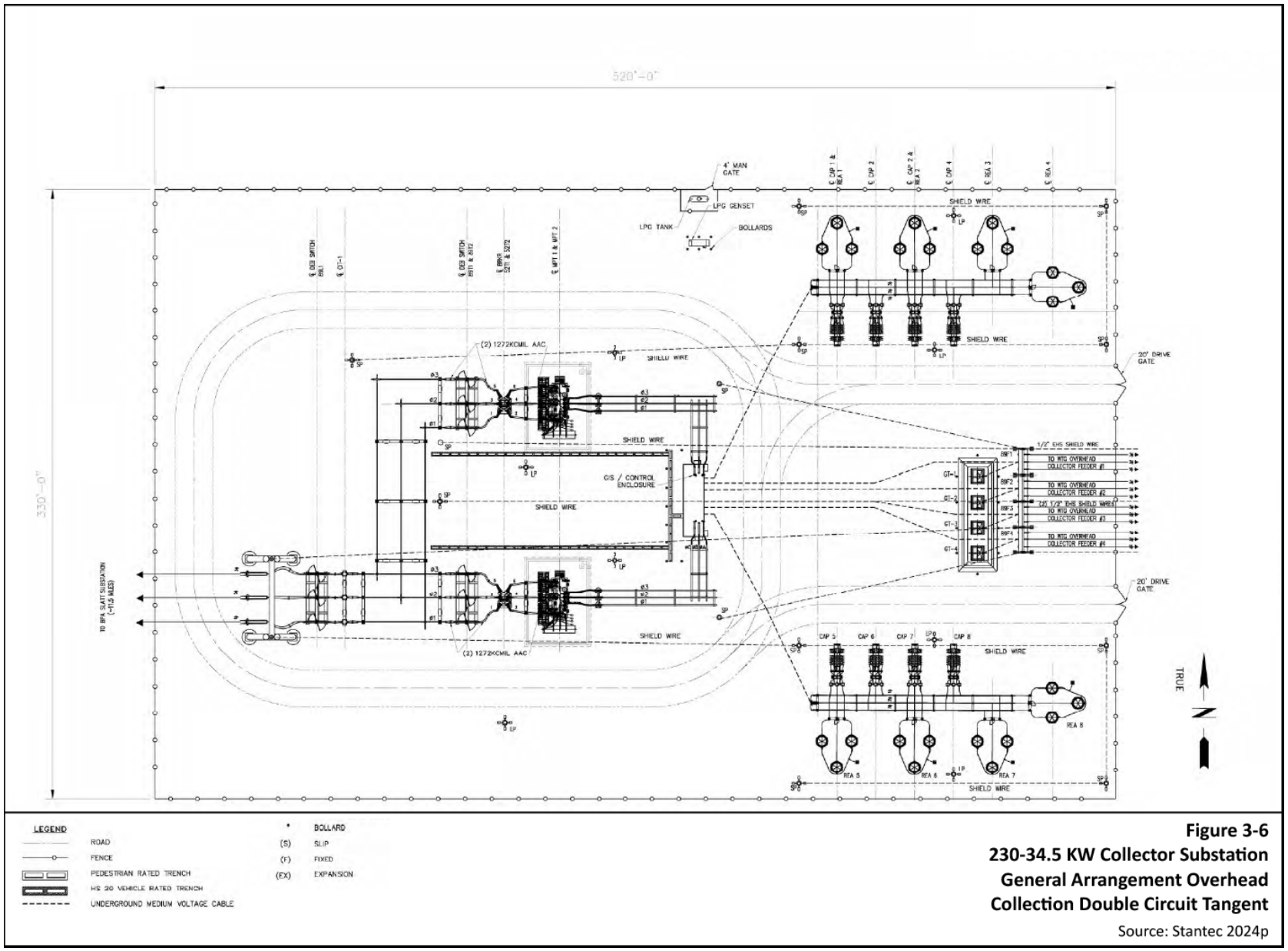


Figure 3-6
230-34.5 KW Collector Substation General Arrangement Overhead Collection Double Circuit Tangent

Source: Stantec 2024p

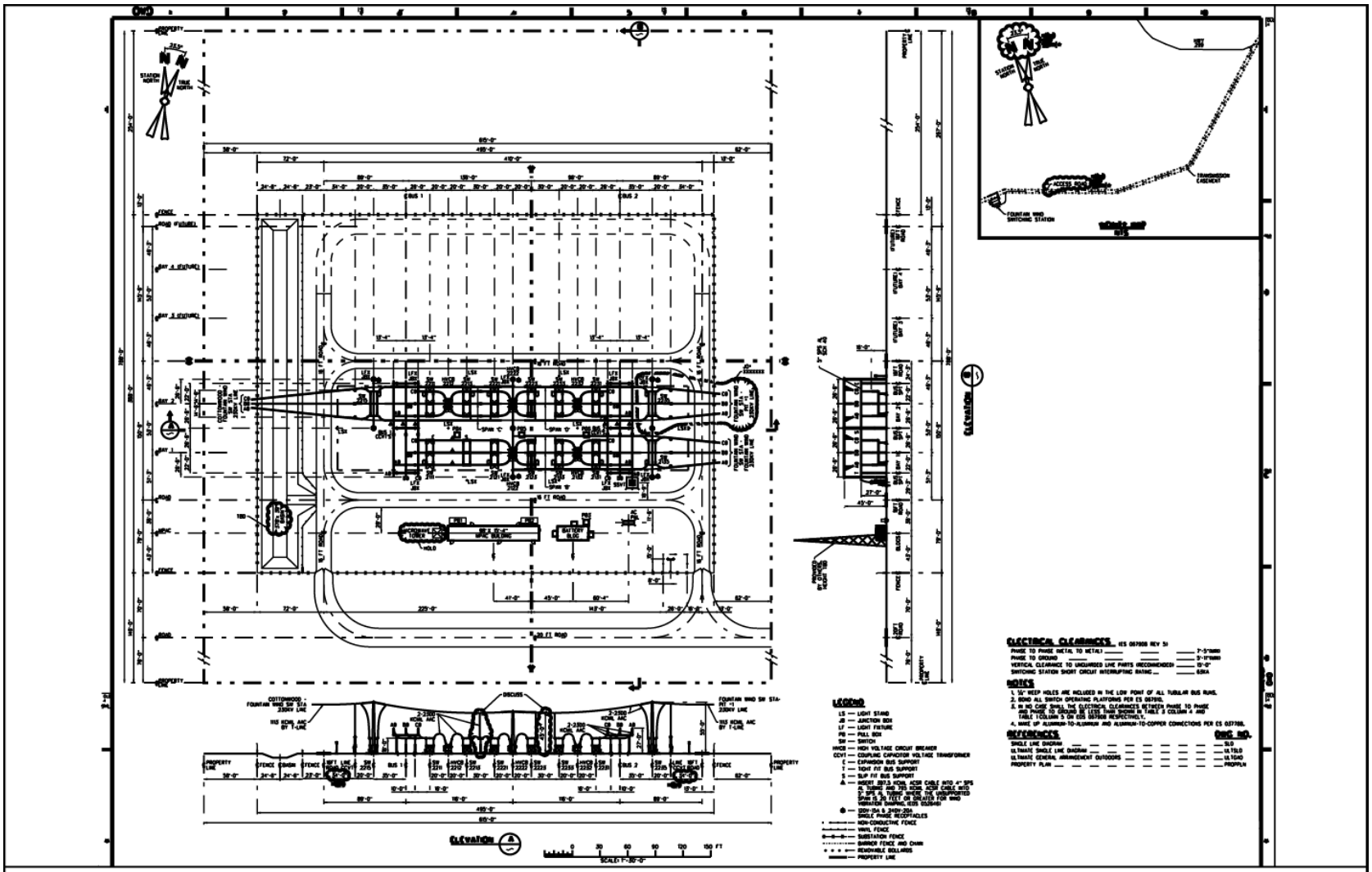


Figure 3-7
Project Switchyard
General Arrangement

Source: Stantec 2024p

The permanent footprint of the substation and switching station would include a graveled parking area for maintenance vehicles. The substation and switching station would be enclosed with chain-link fence. Appropriate safety signs would be posted along roads and around towers, transformers, and other high-voltage facilities in conformance with applicable regulations.

3.5 Other Infrastructure

Access Roads

The project site would be accessed from two existing, gated private logging roads located off SR 299. Existing gates may be replaced or reinforced during project construction. During construction, workers would access the project site using the two access points and would park at the O&M facility or at a laydown area. The proposed road system is shown in **Figure 3-2**. The road layout may be modified as final project designs are developed to maximize the use of existing roads. Access road cross section details are shown in **Figure 3-8**. As new roads are built and existing roads are modified, existing culverts would be replaced as needed with wider, stronger culverts to maintain a functional stormwater drainage system. Drainage improvements would be made in accordance with the project's erosion control plan pursuant to the National Pollution Discharge Elimination System (NPDES) permit. During operation and maintenance activities, the access roads would continue to be used by service vehicles and equipment.

Temporary Construction and Equipment Areas

Construction would require a temporary laydown area of up to 10-acres of cleared, graded, and compacted gravel anticipated to be at the location of the O&M area or concrete batch plant (**Figure 3-2**). This laydown area would be the main construction staging area to store equipment and materials, host construction trailers, refuel equipment, and store construction waste temporarily (i.e., for up to 14 days). Construction waste would be removed weekly or biweekly by a local waste management company.

This area would also provide temporary parking, construction office space (mobile office trailers), and temporary sanitary facilities. A vendor-supplied fuel truck would make daily or weekly deliveries to approved storage tanks, which would then be used to refuel construction vehicles. Fuel tank storage capacity would be determined by the construction contractor. Fuel tanks would be maintained and operated according to all local, state, and federal regulations during construction and operation, and hazardous material storage would be detailed in the Spill Prevention, Control, and Countermeasures (SPCC) Plan.

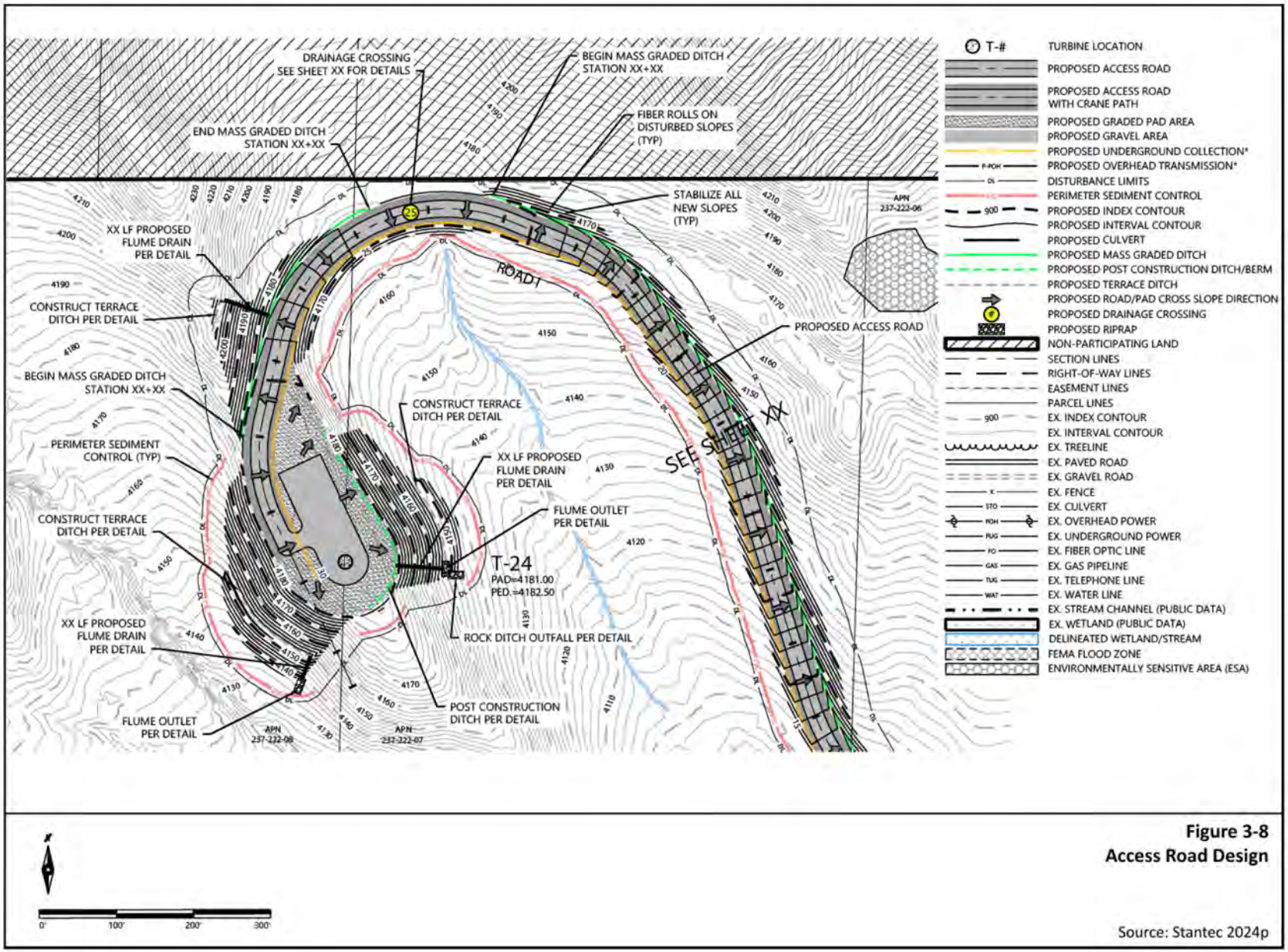


Figure 3-8
Access Road Design

Source: Stantec 2024p

Refueling and general maintenance for construction equipment, such as changing fluids and lubricating parts, would occur within this temporary construction and equipment area or other outdoor locations with sufficient containment capabilities and according to measures outlined in the SPCC Plan. Post-construction, the portions of the staging and laydown area not used for permanent operation and maintenance activities would be restored to preconstruction conditions in accordance with applicable plans, such as a Habitat Restoration Plan, Vegetation Management Plan, and/or Invasive Species Management Plan, as required in proposed Conditions of Certification. Additionally, during construction, up to nine (9) 2-acre laydown (staging) areas would be located throughout the project site to stage building materials and equipment. The final dimensions of each laydown area would be based on site topography and may be graded and compacted or graveled depending on construction needs and soil conditions. Following construction, the laydown areas would be restored in accordance with the applicant-proposed Habitat Restoration Plan and Vegetation Management Plan within one year following the conclusion of construction. Restoration may occur on a rolling basis as construction is completed in the locations served by each laydown area.

Operation and Maintenance Facility

A permanent, 7,000-square-foot O&M facility, storage yard, and parking area would be located within an approximately 5-acre fenced area near SR 299 (**Figures 3-9a**, **3-9b**, and **3-9c**). During the project's operation and maintenance phase, maintenance equipment would be staged in the O&M storage yard. The O&M facility would be served by a new water supply well and water storage tank and an on-site septic system in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. The septic tank would be pumped on a regular basis by a company licensed to pump, transport, and dispose of septic wastewater. If a leach field is utilized, it would rely on effluent absorption and purification to treat the wastewater before it enters groundwater. Wastewater would not be discharged into surface water (Stantec 2024w, Stantec 2024bb).

Meteorological Equipment

Up to three (3) permanent METs would be constructed within the project site to measure and record meteorological data to assess the performance of turbines and guide project operation (**Figure 3-2**). These METs would be un-guyed and freestanding, would be up to 394 feet tall, and would comply with FAA lighting regulations. The applicant would develop an FAA-approved lighting plan that is expected to specify the installation of flashing red lights on designated METs.

Mobile meteorological equipment, such as LiDAR and SoDAR systems, also may temporarily be deployed on-site during operation to supplement wind resource data gathered by the permanent METs. No ground disturbance would result from the use of these mobile units. **Table 3-4a** and **3-4b** below outlines dimensions and finishes for aboveground components.

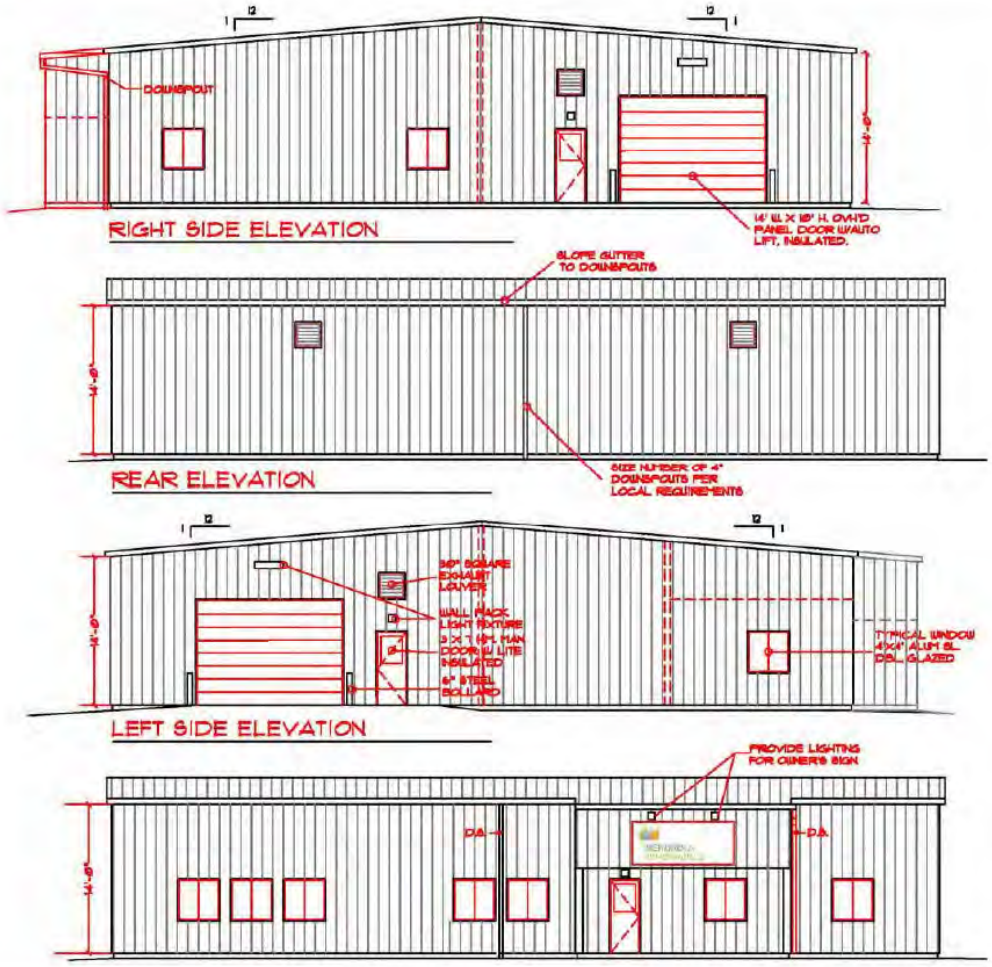


Figure 3-9a
O&M Facility Plan and Profile

Source: Stantec 2024p

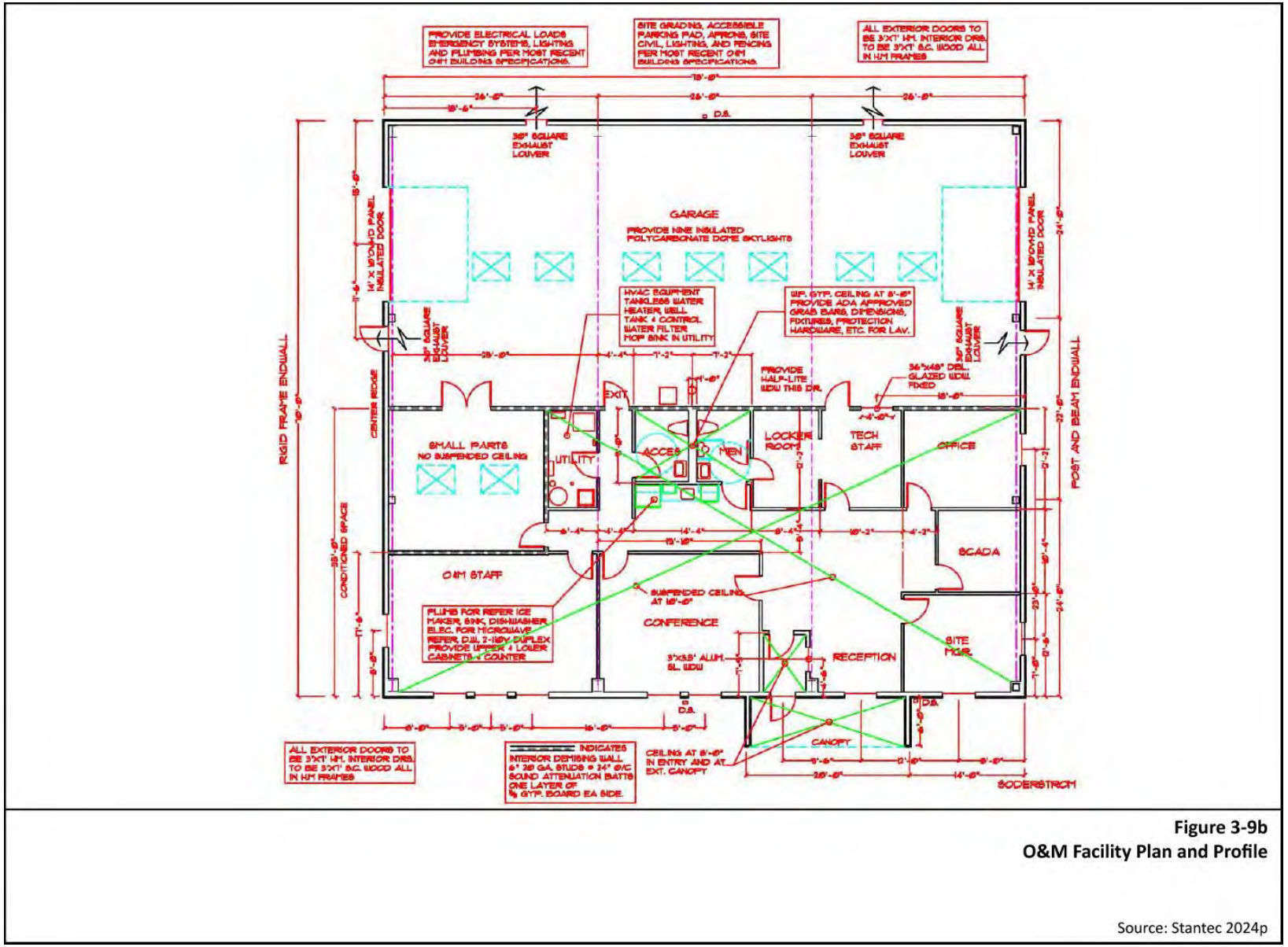


Figure 3-9b
O&M Facility Plan and Profile

Source: Stantec 2024p

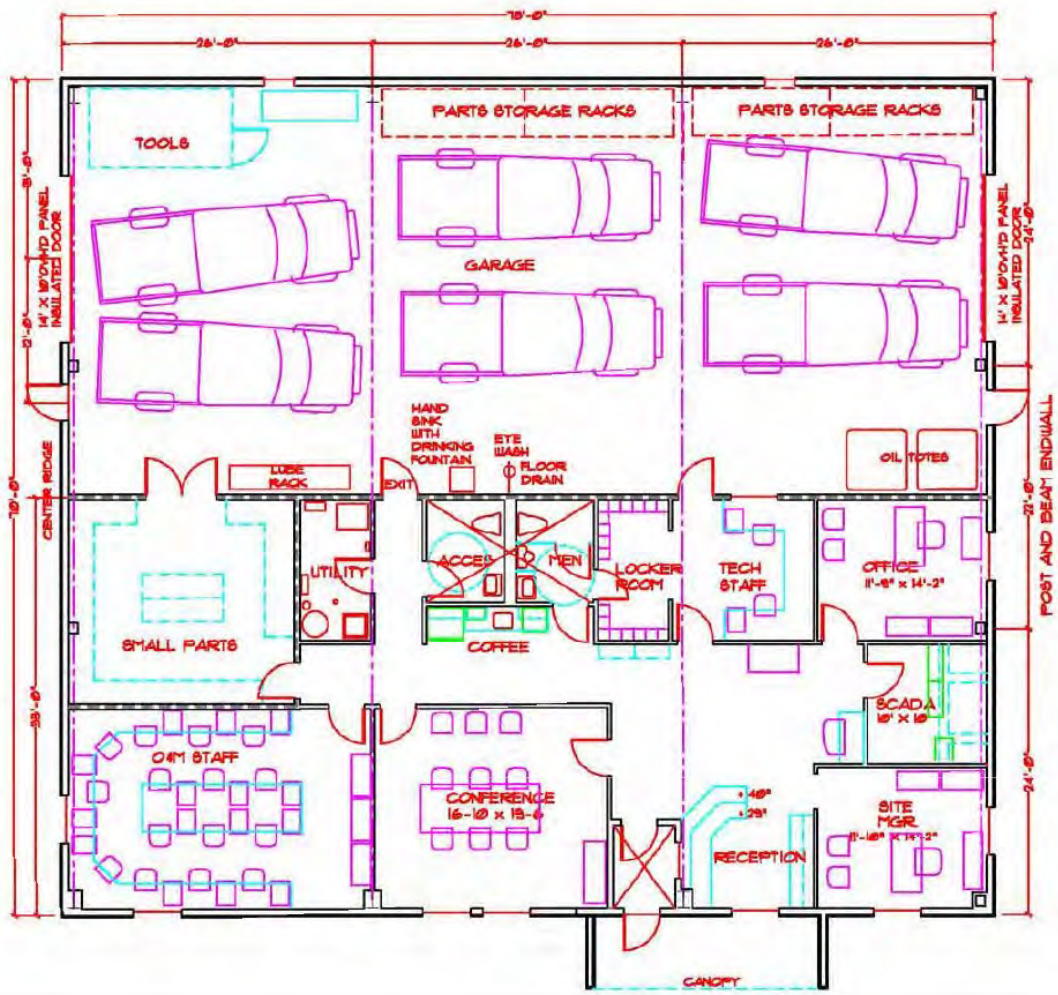


Figure 3-9c
O&M Facility Plan and Profile

Source: Stantec 2024p

TABLE 3-4A APPROXIMATE DIMENSIONS AND COLORS, MATERIALS, AND FINISHES OF MAJOR PROJECT COMPONENTS

Component	Turbines			
Subcomponent	**Nacelle**	**Hub**	**Blade**	**Tower (sections)**
Dimensions	Height: 3.8 m Width: 6.5 m Length: 12.7 m	Height: 4.9 m Width: 4.4 m Length: 4.9 m	Height: 3.2 m Width: 4.4 m Length: 79.6 m	Height: between 9.5 and 22.9 m each
Color	white	white	white	white
Materials	fiberglass	cast iron	fiberglass, carbon fiber, metal	steel
Finish (reflectance)	moderate	moderate	low	low

TABLE 3-4B APPROXIMATE DIMENSIONS AND COLORS, MATERIALS, AND FINISHES OF MAJOR PROJECT COMPONENTS

Component	Overhead Collector Line		Aboveground Facilities							
Subcomponent	**Poles**	**Conductor**	**MET**	**Substation**	**Switching Station**	**O&M Facility**	**Storage Sheds**	**Concrete Batch Plant**	**Microwave Relay Tower (if required)**	**Access Roads**
Dimensions	Height: up to 90 feet	Height: 20 – 30 feet Length: up to 5 miles	Height: up to 394 feet Width (Base): 30 feet	5 acres	8 acres	5 acres	10 feet by 20 feet	15 acres (temporary)	Height: 150 feet	Width: 16 feet Length: up to 19 miles
Color	brown or gray	gray	aviation-safe orange and white	gray	gray	white and gray	multi	--	gray	gray
Materials	wood or steel	aluminum	steel	metal and concrete	metal and concrete	steel and concrete	painted steel	--	steel	gravel or dirt
Finish (reflectance)	low to moderate	low	moderate	low to moderate	low to moderate	low to moderate	moderate	--	moderate	low

3.6 Site Preparation and Construction

Site Preparation

Fencing and Site Security

The project would be located entirely on private property where public access is currently restricted. The on-site switching station and substation would be surrounded by chain-link fence. Where necessary, safety and "No Trespassing" signs would be posted around towers, transformers, other high-voltage facilities, and along roads in accordance with federal and state regulations. Site access roads that diverge from public access points such as SR 299 would be gated, locked, and set back from SR 299 at least 50 feet with a paved apron.

Timber Clearance and Harvesting

Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the project site. Areas that would be removed from timber production may be done only if CEC approves a Timber Harvest Plan consistent with requirements of the Forest Practice Act and California Department of Forestry and Fire Protection's (CAL FIRE's) Forest Practice Rules.

Ground-Disturbing Activities

Construction would include ground-disturbing activities such as clearing and grubbing; topsoil stripping; grading; compaction; utility trenching; soil borings; well-drilling; and excavation (including blasting as needed) for placement of turbine foundations, pads, and aggregate surfacing. Grading activities would include the removal, storage, and disposal of soil, gravel, vegetation, organic matter, loose rock, and debris. Native soil excavated in one part of the project site would be used as fill in another area to minimize soil import and export. Cut and fill dimensions would be finalized along with final engineering designs. Project disturbance areas are summarized in **Table 3-2**.

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

Road Construction and Improvement

The project would be accessed via two existing, gated logging roads located off SR 299. Existing gates may be replaced or reinforced, and the roads would be graveled and

widened as necessary. Access roads are designed to have a 20-foot-wide drivable surface plus a 10-foot buffer on either side for road shoulders and appropriate drainage features, resulting in an approximately 40-foot-wide permanent disturbance area. During construction, some areas could be cleared up to 200 feet wide to accommodate necessary cut-and-fill, stormwater controls, grading, crane travel, and blade-delivery-vehicle turning radii. The project area includes an existing network of logging roads, some of which will be used for the project. Existing logging roads would be widened and modified according to the aforementioned specifications to safely accommodate turbine component delivery vehicles and construction equipment. Road widening details are provided in **Table 3-2**. Fugitive dust control during construction would include the application of appropriate dust suppressants, as necessary, such as water or surfactants approved for use in the State of California.

As new roads are built and existing roads are modified, existing culverts would be upgraded or replaced as needed to maintain a functional stormwater drainage system and meet fire safety and access standards. Individual crossings and culverts would follow appropriate Best Management Practices (BMPs) and comply with all applicable requirements of the United States Army Corps of Engineers, the California Department of Fish and Wildlife, and the Regional Water Quality Control Board. Drainage improvements would be made in accordance with the project's erosion control plan pursuant to the NPDES permit.

During operation, access roads would continue to be used by service vehicles and equipment for project maintenance activities as well as continued timber management and the project operator and timber operator (currently New Forest, Inc.) would share responsibility for road maintenance. Access road maintenance would include periodically grading and compacting of roads, and placement of additional gravel as needed, to minimize erosion. Drainage features such as roadway ditches, and culverts would also be inspected, cleaned, and maintained regularly. Maintenance would be done at a frequency dictated by environmental conditions on-site.

Water Supply Well Installation

The applicant proposes the use of onsite wells for operational potable water, but has not provided information sufficient to evaluate the environmental impacts or feasibility of a wells. Therefore, the applicant would rely on a third-party water purveyor. The project's estimated water demand is discussed in the Water Supply Report (Stantec 2024w, Stantec 2024bb).

Construction Sequence

Initial construction activities would include widening existing access roads and constructing new access roads. Temporary construction staging and laydown areas would also be established to store materials delivered to the project and other project equipment. An area of up to 5-acres would be cleared around each turbine location to create a crane pad, construction laydown area, and gearbox assembly area. Excavation,

cement production onsite, and foundation construction follows. Once turbine foundations are constructed, the turbine components would be transported along access roads, assembled onsite, and erected using forklifts and cranes. Construction of the substation, switching station, underground and overhead collection system, and O&M building would be concurrent with turbine installation. Upon the conclusion of construction, final testing would begin to see that that all systems are functioning properly. As construction activities are completed, temporary staging and laydown areas would be restored to preconstruction conditions. As part of a final site cleanup, all waste materials would be removed from the project site. The project would take approximately 2 years to build. See "Subsection 3.8**"** below for a description of decommissioning and site restoration procedures.

Throughout construction, all construction activities would be implemented consistent with NPDES permit requirements and the Storm Water Pollution Prevention Plan (SWPPP).

Materials Delivery

Delivery of project components would be coordinated through the California Department of Transportation (Caltrans) and timed to minimize traffic disruptions. Coordination would include topics such as final trailer configuration, clearance requirements, emergency service access, lane closures (if necessary), California Highway Patrol escort (if required), and transportation times. For the purposes of this analysis, all materials would be delivered to the project site by truck using SR 299.

Turbines. Delivery plans would be finalized once a final turbine model and supplier is selected. A Transportation Management Plan would be prepared to minimize impacts from the transportation of oversized loads and to direct deliveries to off-peak hours. Oversized loads may be required to travel over bridges and overpasses. A logistical route analysis that focuses on geometrics and bridge capacity will be performed following the final turbine supplier and turbine model selection. In addition, Caltrans would require preparation of a "Swept Path Analysis" that shows turn-by-turn impacts that might be experienced by the oversized loads along SR 299 or at side road intersections. California Highway Patrol would likely be required to escort oversize loads.

Hatchet Ridge Wind Project delivered similarly oversized components along SR 299, the existing highway and bridge geometrics are anticipated to be able to accommodate the planned deliveries. In addition, although the project may utilize longer blade lengths than were used for the Hatchet Ridge project, the haul trucks would include rear-axle steering capabilities, thereby addressing many turning constraints. In general, towers are expected to be delivered in three to six sections. Turbine components such as blades, nacelles, rotors, controllers, ladders and platforms, pad-mounted transformers, pad-mounted transformer vaults, and turbine switchgear would be delivered separately. Up to 15 separate delivery loads would be needed for each turbine. Of these, approximately nine deliveries would be classified as oversized for highway

transportation according to California Vehicle Code Division 15, Size, Weight, and Load. These deliveries would require oversize vehicle permits and/or variances from Caltrans. Turbine component delivery vehicles would conform to road weight limits, and any deviations from these weight limits would be specified in oversize permit applications submitted to Caltrans. Additionally, cranes used to assemble turbine components would be delivered in multiple loads and assembled on-site.

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

Project construction is anticipated to generate up to 88,447 two-way material delivery truck trips assuming that cement would be hauled in from on off-site supplier rather than batched on site. Material delivery trucks would carry aggregate, turbine-related components, concrete components, water, and other construction-related materials. The applicant anticipates that the bulk of materials would be delivered by truck from locations no more than 50 miles from the project site. Prior to arrival on-site, large components such as turbine blades are likely to be delivered by truck, barge, or rail to existing regional storage yards.

Construction Equipment. Equipment types and use assumptions by phase to construct the project are identified in **Table 3-5** below.

Construction Schedule and Workforce

Project construction is expected to last 24 to 28 months. The calendar dates of project construction would depend on the timing of receipt of regulatory approvals. Generally, construction would occur during daylight hours from 7 am to 5 pm but could vary during summer or winter months, to accommodate specific construction needs or site conditions, to avoid traffic or high winds, or to facilitate the project schedule. The project would require up to 200 workers at peak construction, most of whom are expected to reside in Shasta County and commute to the project site. No new temporary worker lodging is expected to be constructed as part of the project.

TABLE 3-5 CONSTRUCTION EQUIPMENT LIST

Phase	Workdays	Equipment Type	Number	Hours/Day
Timber Removal and Grubbing	55	Feller Buncher (logging)	2	10
		Logging Trucks	8	
		Skidder	2	
		Pickups	8	
		Hydro Axe	2	
Grading and Access Road Work	126	Road Grader	3	10
		Scraper	4	
		Bulldozer (medium)	6	
		Drum Compactor	4	
		Rock Trucks	8	
		Pickups	16	
		Water Truck	6	
Concrete Batch Plants	70	Concrete Pump Truck	2	10
		Mixer	10	
		Generator	3	
		Skid Steer Loader	3	
		Pickups	6	
		Water Truck	3	
Turbine, Transformer, Substation, and O&M Foundations	70	Excavator	3	10
		Bulldozer (medium)	3	
		Drum Compactor	4	
		Skid Steer Loader	3	
		Pickups	10	
		Mobile Hydraulic Crane	3	
Turbine and Transformer Installation	66	Mobile Hydraulic Crane	6	10
		Bulldozer (medium)	2	
		Rubber Tired Forklifts	10	
		Large Crawler Crane	4	
		Pickups	20	
		Turbine Delivery Vehicles	8	
		Generator	4	
Substation and O&M Building Installation	160	Mobile Hydraulic Crane	2	10
		Skid Steer Loader	2	
		Pickups	8	
		Rubber Tired Forklift	3	
Underground Collector System	95	Trenching Equipment	4	10
		Rubber Tired Forklift	4	
		Pickups	12	
		Bulldozer (medium)	1	
		Skid Steer Loader	4	
Overhead Collection System	40	Backhoe Loader (includes setting collector system poles)	4	10
		Cable Reel Truck (includes auger for pole foundations)	3	
		Mobile Hydraulic Crane	2	
		Pickups	10	
		Bulldozer (medium)	1	
		Boom Lift	6	

TABLE 3-5 CONSTRUCTION EQUIPMENT LIST

Phase	Workdays	Equipment Type	Number	Hours/Day
Substation Aggregate and Security Fence	15	Skid Steer Loader	1	10
Transmission Line Connection	20	Mobile Hydraulic Crane	6	10
		Cable Reel Truck (includes auger for pole foundations)	4	
		Boom Lift	6	
		Pickups	8	
		Bulldozer (medium)	1	
		Excavator	2	

Stormwater Control

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

In accordance with the Construction General Permit, the applicant would prepare a site-specific SWPPP for the project that would identify BMPs to be used to minimize or eliminate pollution, erosion, and sedimentation.

3.7 Operation and Maintenance

Although upgrading and replacing equipment could extend the operating life of the wind energy facility indefinitely, for purposes of the California Environmental Quality Act (CEQA), the life of the project is assumed to be approximately 35 years.

The applicant would prepare a project-specific Fire Prevention Plan (FPP) prior to the commencement of on-site activities that would remain in place for the life of the project. The FPP would include procedures for emergency response, evacuation, fire agency notification, and fire prevention. Some aerial fire suppression resources would be of limited use in the project area in the event of a wildfire. Tree removal and maintenance of fire breaks would be undertaken. The FPP would require the applicant's and construction contractors' vehicles and personnel to be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. The applicant's FPP would be prepared consistent with the directives in the Shasta County Fire Safety Standards, the Forest Practice Rules, and CAL FIRE's Shasta-Trinity Unit Strategic Fire Plan.

Project operation would require up to 8 full-time employees. Operation and maintenance activities would occur from Monday to Friday during normal working hours. Potable water for operations employees would be provided by a licensed offsite provider unless Shasta County approves anew water supply well and water storage tank at the site of the O&M building. The facility would be un-attended by employees outside

of normal business hours, but operational employees would be on-call outside of regular working hours on an as-needed basis (Stantec 2024v, Stantec 2024bb). The project operator would also monitor the turbines through the SCADA monitoring system 24 hours a day, 7 days a week, 365 days a year via a Remote Operation Control Center (ROCC). The SCADA system would allow the ROCC to perform self-diagnostic tests and would allow a remote operator to perform system checks, establish operating parameters, identify operating problems, and see that the turbines are operating at peak performance. There is no plan to monitor the area immediately outside the project footprint for wildfire.

Maintenance of turbines and associated infrastructure includes a wide variety of activities. The applicant would develop an operation and maintenance protocol to be implemented throughout project operation. This protocol would specify routine turbine maintenance and operation in accordance with the maintenance requirements prescribed by the turbine manufacturer. Some unscheduled maintenance and repair would be necessary. Routine maintenance activities are expected to include, but not be limited to the following:

- checking torque on tower bolts and foundation anchor bolts;
- checking for cracks and other signs of stress on the turbine tower and other turbine components;
- inspecting for leakage of lubricants, hydraulic fluids and other hazardous materials, and replacing them as necessary;
- inspecting the grounding cables, wire ropes and clips, and surge arrestors;
- cleaning; and
- repainting

Most routine maintenance activities would occur within and around the tower and the nacelle. Cleanup from routine maintenance activities would be performed at the time maintenance is performed. While performing most routine maintenance activities, operations and maintenance staff would travel via pickup or other light-duty trucks.

Scheduled maintenance activities would include servicing the turbines twice a year or more often as needed. Turbine servicing would require maintenance staff to climb towers and perform activities such as replacing bearings, applying lubricants, and replacing hydraulic fluids. Non-routine maintenance such as repair or replacement of blades or other major components, if needed, could involve use of one or more cranes and equipment transport vehicles. Project access roads would be periodically graded and compacted in order to minimize erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

3.8 Decommissioning and Site Restoration

Decommissioning of existing facilities and infrastructure and restoration of the project site would require approximately 18 to 24 months. Decommissioning refers to the dismantling and removal of the project's facilities, including power generation equipment. Removal of turbine components and related infrastructure would include dismantling the turbines, support towers, transformers, substation, switching station, and foundations; excavating them to a depth of approximately three feet below grade; and removing them from the project site to be reused, recycled, or sold. Once turbines have been dismantled and removed, roads no longer needed to access those locations would be allowed to naturally revegetate. If a water supply well is installed, it would remain on-site, or would be properly abandoned according to regulatory requirements. Underground collection and communication cables would be abandoned in place.

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

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

Prior to operation of the project, the applicant would prepare a Draft Decommissioning Plan that details a restoration plan and how project facilities and infrastructure would be removed. The Draft Decommissioning Plan would be revised and finalized prior to project operations. The applicant or its contractor would implement the Final Decommissioning Plan upon cessation of project operations and would include plans and procedures for facility dismantling and removal, disposal and recycling, site restoration, and habitat restoration and monitoring. The Decommissioning Plan would be developed in compliance with standards and requirements at the time of site decommissioning. The applicant would separately be required to post and update a financial assurance mechanism to cover the cost of specified mitigation for impacts to biological resources. This financial assurance would ensure that all biological resources mitigation requirements of the project have been fulfilled.

3.9 Water, Wastewater, Waste, and Hazardous Materials

Water and Wastewater

Non-potable water would be trucked to the project site from Burney Falls for use during construction. The applicant proposes the use of onsite wells for operational potable water, but staff was not able to assess the impacts to onsite well pumping, or its feasibility, given the information provided. Therefore, the applicant may need to rely on a third-party water purveyor.

Project construction would require up to 310 acre-feet of water for dust control, soil compaction, concrete manufacture, emergency fire suppression, and other activities over a two-year period. Water would also be used to fill and maintain three 5,000-gallon tanks through the life of the project for the purposes of fire suppression.

Operation and maintenance of the project would require up to 5.6 acre-feet of water per year (approximately 5,000 gallons per day) for vehicle and equipment washing and maintenance, potable water supplies for up to 8 full-time employees, and water storage to meet Shasta County fire flow requirements. Water for the O&M building and storage tank located at the O&M building would be supplied by a water purveyor. Water use during decommissioning and site restoration would be limited to use for fire protection and dust suppression.

During construction, portable toilets would be provided for the construction workforce. These facilities would be serviced on a regular basis by a contractor who would dispose of sanitary wastewater pursuant to applicable regulations. Wastewater from the O&M facility would be disposed of using an on-site septic system. Maximum daily wastewater discharge would be approximately 160 gallons/day.

The project would comply with applicable fire flow requirements in the Shasta County Code of Ordinances, Title 16 Buildings and Construction, Chapter 16.04.130 Fire Standards and Equipment (Ordinance No. 2019-06 [2019]) and the 2019 California Fire Code (24 Cal. Code Regs. Part 9).

Waste

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

Hazardous Materials

Table 3-6, Hazardous Materials, describes the types, uses, and quantities of hazardous materials that are expected to be used during the site preparation and construction, operation, maintenance, decommissioning, and site restoration phases of the project.

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

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

TABLE 3-6 HAZARDOUS MATERIALS

Hazardous Material	Uses	Typical Quantities
Diesel[a]	Fuel for construction and transportation equipment during construction and decommissioning. Used to power an emergency generator during operation, if needed.	Over 5,000 gallons would be stored in aboveground tanks during construction and operation. The amount of diesel to be stored onsite during decommissioning is unknown at this time but is assumed be similar to that of construction.[b]
Gasoline	Some construction equipment and transportation vehicles.	Gasoline would be stored onsite in temporary aboveground storage tanks during project construction.
Propane[a]	Ambient heating of the O&M building.	Approximately 500 to 1,000 gallons stored in an aboveground propane storage vessel.
Lubricating oils/ grease/hydraulic fluids/gear oils	Lubricating oil would be present in some turbine components, in the diesel engine of the emergency generator, and in engines of construction and transportation equipment.	Limited quantities would be stored in portable containers (capacity of 55 gallons or less) and maintained onsite during all phases of the Project.
Glycol-based antifreeze	Used in wind turbine components for cooling (approximately 5 to 10 gallons are present in the cooling system for the transmission. Used in the diesel engine for the emergency generator.	Limited quantities (10 to 20 gallons of concentrate) would be stored onsite during each phase of the project.
Lead-acid storage batteries and electrolyte solution	Present in construction and transportation equipment. Backup power source for control equipment, tower lighting, and signal transmitters.	Limited quantities of electrolyte solution (<20 gallons) for maintenance of construction and transportation equipment during construction and decommissioning.

TABLE 3-6 HAZARDOUS MATERIALS

Hazardous Material	Uses	Typical Quantities
Other batteries (e.g., nickel- cadmium batteries)	Used in some control equipment and signal- transmitting equipment.	These batteries would not be maintained onsite.
Cleaning solvents	Organic solvents would be used for equipment cleaning and maintenance when water-based cleaning and degreasing solvents cannot be used.	Limited quantities or organic solvents (<55 gallons) would be stored onsite during construction and decommissioning to maintain construction and transportation equipment. Limited quantities (<10 gallons) of water-based cleaning solvents would be stored onsite during operation.
Paints and coatings[c]	Used for corrosion control on exterior surfaces of turbine towers.	Limited quantities would be used for touch up painting during construction (<50 gallons) and for maintenance during operations (<20 gallons).
Dielectric fluids[d]	Used in electrical transformers, bushings, and other electric power management devices as an electrical insulator.	Some transformers may contain more than 500 gallons of dielectric fluid. Onsite transformers each contain approximately 10,000 gallons of mineral oil.
Explosives	May be necessary for excavation of tower foundations in bedrock or creating construction access, onsite roads, or grade alterations.	Limited quantities necessary to complete th task would be stored onsite. Onsite storage is expected to occur only for limited period of time and as needed for specific construction activities.
Herbicides	May be used for vegetation control around facilities for fire safety.	If deemed necessary, herbicides would be brought to the site and applied by a license applicator.

Notes:

a. Diesel fuel and propane would be replenished onsite by commercial vendors as necessary.
b. These values represent the total onsite storage capacity, not the total amount of fuel that would be consumed during project construction.
c. It is presumed that all wind turbine components, nacelles, and support towers would be painted at their respective points of manufacture. No wholesale painting would occur onsite; only limited amounts would be used for touch-up purposes during construction and maintenance phases. It is assumed that the coatings applied by the manufacturer during fabrication would be sufficiently durable to last throughout the equipment's operational period and that no wholesale repainting would occur.
d. It is assumed that the majority of transformers, bushings, and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication and would not require dielectric fluid to be added onsite. It is assumed that servicing of electrical devices that involves wholesale removal and replacement of dielectric fluids would not occur onsite and that equipment requiring such servicing would be removed from the site and replaced. New transformers, bushings, or electrical devices are expected to contain mineral oil- based, or synthetic dielectric fluids that are free of polychlorinated biphenyls. Some equipment may instead contain gaseous dielectric agents (e.g., sulfur hexafluoride) rather than liquid dielectric fluids.

In accordance with requirements contained in the Health and Safety Code and the California Code of Regulations, the applicant would prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan (HMBP/SPCC) prior to construction. The HMBP would include BMPs for the transport, storage, use, and

disposal of hazardous materials and waste. The HMBP would also include information regarding construction activities, worker training procedures, and hazardous materials inventory procedures. Prior to operation, the applicant would update the HMBP (including the BMPs) with information about the types of hazardous materials that would be used during operation. The HMBP/SPCC would comply with the requirements of these federal, state, and local requirements (e.g., 40 CFR Part 112).

During construction, operation, and decommissioning, all fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment area consisting of an impervious floor and bermed sidewalls. Fuel would be stored in aboveground storage tanks.

These tanks may have either a double wall or would be placed within temporary, lined, earthen berms for spill containment. Upon the conclusion of construction and decommissioning phases, excess fuels would be removed from the site and any surface contamination resulting from fuel handling operations would be remediated.

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

3.10 Intended Uses of this Environmental Document

This environmental document supports the CEC's decision on whether to certify the construction and operation of the project. Under Public Resources Code section 25545.1 the CEC has the exclusive jurisdiction to consider and certify this project and all related permits or licenses, with narrow exceptions, are subsumed into the CEC certification. The CEC does not anticipate other state or local jurisdictions using this environmental document to issue any permits or licenses except for the possibility of the Regional Water Quality Control Board or delegated local agency issuing a permit for an onsite septic system.

In developing this environmental analysis staff consulted with various other state and local agencies including the California Department of Fish and Wildlife, CAL FIRE, and Shasta County.

3.11 References

CEC 2023a – California Energy Commission (CEC). TN 248742. Docket: 23-OPT-01. Deficiency Letter. Dated February 10, 2023. Accessed on February 13, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2020b – Shasta County Department of Resource Management Planning Division (Shasta County). TN 248288-2. Docket: 23-OPT-01. DEIR Description of Project and Alternatives. Dated July 2020. Accessed on April 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023a – Stantec Consulting Services, Inc. (Stantec). TN 250551. Docket: 23-OPT-01. ALT-01_02_fwp_site_selection_and_proj_obj. Dated June 8, 2023. Accessed on June 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024p – Stantec Consulting Services, Inc. (Stantec). TN 254794. FWP Description Update, dated March 4, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024v – Stantec Consulting Services, Inc. (Stantec). TN 256385. FWP Water Responses, dated May 15, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024w – Stantec Consulting Services, Inc. (Stantec). TN 256386. FWP Water Supply Report V3, dated May 15, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024bb – Stantec Consulting Services, Inc. (Stantec). TN 259953. Response to County Comments on Water Supply, dated November 8, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Section 4

Engineering Evaluation

The purpose of this analysis is to ensure that the project would be built to applicable engineering codes, ensure public health and safety, and verify that applicable engineering LORS have been identified. This analysis also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant to adopt a compliance monitoring program that will verify compliance with these LORS.

4.1 Facility Design

4.1.1 Setting

Fountain Wind Project (FWP or project) proposes to construct and operate a wind energy generation facility with a maximum generating capacity 205 MW (FWPA TN#251663). The project would be located within the unincorporated area of Shasta County and will lie in seismic zone 3 (FWPA TN#251663, and NRC 2015). FWP would be located on 37 parcels encompassing approximately 16,108 acres, of which 2,855 acres would be used for infrastructure and construction activities. For more information on the site and related project description, please see the **Project Description** section of this document.

Regulatory

International

International Electrotechnical Commission (IEC) Standard for Wind Energy Generation Systems (IEC 61400). The IEC standard comprehensively addresses safety, design requirements, and testing guidelines for wind energy generation systems. This standard is intended to ensure the safe and stable operation of wind turbines throughout their expected lifetime and under any environmental conditions.

Federal

None.

State

California Building Standards Code 2022 (or the latest edition in effect) (also known as Title 24, California Code of Regulations). The California Building Standards Code applies to the planning, design, operation, construction, use, and occupancy of power plants and their ancillary facilities.

Local

Shasta County Seismic and Geologic Hazards. The County's General Plan Seismic and Geologic Hazards Element is dedicated to enhancing public safety and the welfare of the community by mitigating the dangers associated with seismic activities and geological events. Such efforts are crucial in reducing the potential for loss of life or injury due to seismic activities and geological events (Shasta County 2004a).

4.1.2 Impacts

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the project. The purpose and subject of this analysis is to:

- Verify that the laws, ordinances, regulations, and standards (LORS) applicable to the engineering design and construction of the project have been identified;

- Verify that the project and ancillary facilities have been described in sufficient detail upon review and approval of the California Energy Commission's (CEC) Delegate Chief Building Official (DCBO) including proposed design criteria and analysis methods;
- Through the DCBO's review and approval process, provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- Through the DCBO's oversight and approval process, determine whether special design features should be considered during final design to deal with conditions unique to the site which could affect public health and safety; and
- Describe the design review and construction inspection process and establish conditions of certification (COCs) that will be used to monitor and ensure compliance with the engineering LORS and any special design requirements.

4.1.3 Applicable LORS and Project Conformance

Table 4.1-1 staff's determination of conformance with applicable local, state and federal LORS, including any proposed COCs, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "4.1.5 Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 4.1-1 COMPLIANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
International	
International Electrotechnical Commission (IEC) Standard for Wind Energy Generation Systems – Part 1: Design Requirements (IEC 61400-1)	**Yes**. With implementation of Condition of Certification **GEN-1** and **MECH-1**
State	
California Building Standards Code 2022 (or the latest edition in effect) (also known as Title 24, California Code of Regulations)	**Yes.** With implementation of Conditions of Certification **GEN-1** through **GEN-8**, **CIVIL-1** through **CIVIL-4**, **STRUC-1** through **STRUC-4**, **MECH-1**, **MECH-2**, and **ELEC-1**
Local	
Shasta County Seismic and Geologic Hazards	**Yes.** With implementation of Conditions of Certification **CIVIL-1** and **CIVIL-4**, and **STRUC-1** through **STRUC-4**
General	

TABLE 4.1-1 COMPLIANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Air Moving and Conditioning Association (AMCA) American Concrete Institute (ACI) Codes American Institute of Steel Construction (AISC) Codes American National Standards Institute (ANSI) Codes American Society of Testing and Materials (ASTM) Codes American Society of Civil Engineers (ASCE) Codes American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) American Welding Society (AWS) ASME Performance Test Codes California Electrical Code Concrete Reinforcing Steel Institute (CRSI) Codes National Electric Safety Code (NESC) National Fire Protection Association (NFPA Standards) Occupational Safety and Health Administration (OSHA) Safety standards for wind turbine tower elevators (ASME A17.9-2) Standard for Wind Energy Generation Systems – Design Requirements (IEC 61400-1) Standard for Wind Energy Generation Systems – Lightning Protection (IEC 61400-24) Steel Deck Institute (SDI) – Design Manual for Floor Decks and Roof Decks Underwriters Laboratories, Inc. (UL) Wind Energy Generation Systems - Part 6: Tower and Foundation Design Requirements (ANSI/ACP 61400-6)	**Yes.** With implementation of Conditions of Certification **CIVIL-1** through **CIVIL-4**, **STRUC-1** through **STRUC-4**, **MECH-1**, **MECH-2**, and **ELEC-1**

4.1.4 Conclusions and Recommendations

CEC staff concludes that the design, and construction of the project and its linear facilities which consist of up to 48 wind turbines, collection lines, a substation, a switchyard, an O&M building, and access roads would comply with the applicable LORS.

The proposed COCs would ensure that the FWP is designed and constructed in accordance with applicable engineering LORS. This would be accomplished through design review, plan checking, and field inspections that would be performed by the DCBO. CEC staff would oversee the DCBO's work to ensure satisfactory performance.

4.1.5 Proposed Conditions of Certification

The following proposed COCs include both measures to mitigate environmental impacts and ensure conformance with applicable LORS.

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2022 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the DCBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving (onsite), demolition, repair, or maintenance of the completed facility.

In the event that the initial engineering designs are submitted to the DCBO when the successor to the 2022 CBSC is in effect, the 2022 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy (CofO), the project owner shall submit to the Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the CEC's decision have been met in the area of Facility Design. The project owner shall provide the CPM a copy of the CofO within 30 days of receipt from the DCBO.

Once the CofO has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires DCBO approval for compliance with the above codes. The CPM will then determine if the DCBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for DCBO review, the project owner shall furnish the CPM and the DCBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment. Major structures, systems, and equipment are

structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. The schedule shall contain the date of each submittal to the DCBO. To facilitate audits by CEC staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 60 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of rough grading, the project owner shall submit to the DCBO and to the CPM the schedule, and the master drawings and master specifications list of documents to be submitted to the DCBO, for review and approval. These documents shall be the pertinent design documents for the major structures, systems, and equipment defined above in Condition of Certification GEN-2. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report (MCR).

GEN-3 The project owner shall make payments to the DCBO for design review, plan checks, construction inspections, and other applicable DCBO activities, based upon a reasonable fee schedule to be negotiated between the project owner and the DCBO. If the CEC delegates the DCBO function to a third party or local agency, the project owner, at the CEC's direction, shall make payments directly to the DCBO based upon a fee schedule negotiated between the CEC and the DCBO. These fees may be consistent with the fees listed in the 2022 CBC, adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the DCBO.

Verification: The project owner shall make the required payments to the DCBO in accordance with the agreement between the project owner and the DCBO. If the CEC delegates the DCBO function to a third party or local agency, the project owner, at the CEC's direction, shall make payments directly to the DCBO based upon a fee schedule negotiated between the CEC and the DCBO. The project owner shall send a copy of the DCBO's receipt of payment to the CPM in the next MCR indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a

distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring DCBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to DCBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the DCBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the DCBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or their delegate) must be located at the project site or be available at the project site within a reasonable time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer.

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of rough grading, the project owner shall submit to the DCBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the DCBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the name, qualifications, and

registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code sections 6704, 6730, 6731, and 6736 require state registration to practice as a civil engineer or structural engineer in California).

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the DCBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the DCBO. These include, but may not be limited to grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;
2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement, or collapse when saturated under load;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2022 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2022 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the DCBO, stating that the proposed final design plans, specifications, and calculations conform to all of

the mechanical engineering design requirements set forth in the CEC's decision.

F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of rough grading, the project owner shall submit to the DCBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer, and engineering geologist assigned to the project.

At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of construction, the project owner shall submit to the DCBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the DCBO's approvals of the responsible engineers within five days of the approval.

If any one of the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the DCBO for review and approval. The project owner shall notify the CPM of the DCBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2022 CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the DCBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Inspect the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the DCBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the DCBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, DCBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and DCBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the DCBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the DCBO's approval of the qualifications of all special inspectors in the next MCR.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the DCBO for approval. The project owner shall notify the CPM of the DCBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone DCBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the DCBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the DCBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next MCR. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain DCBO's approval.

GEN-8 The project owner shall obtain the DCBO's final approval of all completed work that has undergone DCBO design review and approval. The project owner shall request the DCBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the DCBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site, or at another accessible location, during the operating life of the

project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-built shall be provided to the DCBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the DCBO, with a copy to the CPM in the next MCR, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the DCBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" files (the latest version of Adobe .pdf available), with restricted (password-protected) printing privileges.

CIVIL-1 The project owner shall submit to the DCBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. A construction storm water pollution prevention plan (SWPPP);
4. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
5. Soils, geotechnical, or foundation investigations reports required by the 2022 CBC.

Verification: At least 15 days (or project owner- and DCBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the DCBO for design review and approval. In the next MCR following the DCBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the DCBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering, identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the DCBO based on these new conditions. The project owner shall obtain approval from the DCBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the DCBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the DCBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2022 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the DCBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the DCBO, and the CPM. The project owner shall prepare a written report, with copies to the DCBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the DCBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the DCBO and the CPM. A list of NCRs for the reporting month shall also be included in the following MCR.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the DCBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within their area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and DCBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the DCBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of the DCBO's approval to the CPM in the next MCR.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit plans, calculations, and other supporting documentation to the DCBO for design review and acceptance for all project structures and equipment identified in the DCBO-approved master drawing and master specifications list. The design plans and calculations shall include the lateral force procedures and details as well as vertical calculations.

Construction of any structure or component shall not begin until the DCBO has approved the lateral force procedures to be employed in designing that structure or component. The project owner shall:

1. Obtain approval from the DCBO of lateral force procedures proposed for project structures;
2. Obtain approval from the DCBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;
3. Submit to the DCBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and
5. Submit to the DCBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS, which may include, but are not limited to:
    - ANSI/ACP 61400-6 (Wind Energy Generation Systems - Part 6: Tower and Foundation Design Requirements);

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of any increment of construction of any structure or component listed in the DCBO-approved master drawing and master specifications list, the project owner shall submit to the DCBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next MCR, a copy of a statement from the DCBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the DCBO the required number of sets of the following documents related to work that has undergone DCBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type

and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2022 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit a NCR describing the nature of the discrepancies and the proposed corrective action to the DCBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the DCBO and the CPM.

The project owner shall transmit a copy of the DCBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval, and the revised corrective action to obtain DCBO's approval.

STRUC-3 The project owner shall submit to the DCBO design changes to the final plans required by the 2022 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the DCBO prior notice of the intended filing.

Verification: On a schedule suitable to the DCBO, the project owner shall notify the DCBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above- mentioned documents to the DCBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the MCR, when the DCBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2022 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the

project owner shall submit to the DCBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the DCBO approvals of plan checks to the CPM in the MCR following receipt of such approvals. The project owner shall also transmit a copy of the DCBO's inspection approvals to the CPM in the MCR following completion of any inspection.

MECH-1 The project owner shall submit, for DCBO design review and approval, the proposed final design, specifications, and calculations for the project's mechanical-related components listed in the DCBO-approved master drawing and master specifications list. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such component, the project owner shall request the DCBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major the project's mechanical-related components, subject to DCBO design review and approval, and submit a signed statement to the DCBO when the proposed components have been designed, fabricated, and installed in accordance with all of the applicable LORS, which may include, but are not limited to:

- ASME A17.9-2 (Safety standards for wind turbine tower elevators);
- IEC 61400-1 (Standard for Wind Energy Generation Systems – Design Requirements);
- IEC 61400-24 (Standard for Wind Energy Generation Systems – Lightning Protection);
- NACE SP187-2017 (Design for Corrosion Control of Reinforcing Steel in Concrete);
- NFPA 70B (Practices for Electrical Equipment Maintenance—to reduce hazard to life safety);
- NFPA 850 (Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations, Chapter 10 of this standard provides comprehensive guidelines for identifying and mitigating fire and explosion hazards in wind turbine generating facilities);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems); and
- Title 24, California Code of Regulations, Part 2 (California Building Code).

The DCBO may deputize inspectors to carry out the functions of the CEC's code enforcement mandate.

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of any increment of major mechanical-related components' construction listed in the DCBO-approved master drawing and master specifications list, the project owner shall submit to the DCBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next MCR.

The project owner shall transmit to the CPM, in the MCR following completion of any inspection, a copy of the transmittal letter conveying the DCBO's inspection approvals.

MECH-2 The project owner shall submit to the DCBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system.

Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the DCBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the DCBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the DCBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 110 Volts or higher (see a representative list, below) the project owner shall submit, for DCBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on

the site or at another accessible location for the operating life of the project. The project owner shall request that the DCBO inspect the installation to ensure compliance with the requirements of applicable LORS.

A. Final plant design plans shall include:

1. one-line diagram for the 13.1 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;
3. lightning protection system; and
4. hazard area classification plan.

B. Final plant calculations must establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.1 kV, 4.16 kV and 110/480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. 110-Volt system design calculations and submittals showing feeder sizing, transformer and panel load confirmation, fixture schedules and layout plans.

C. The following activities shall be reported to the CPM in the MCR:

1. Receipt or delay of major electrical equipment;
2. Testing or energizing of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the CEC decision.

Verification: At least 30 days (or a project owner and DCBO mutually agreed upon alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the DCBO for design review and approval the above listed documents.

The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS and shall send the CPM a copy of the transmittal letter in the next MCR.

4.1.6 References

Shasta County 2004a – Seismic and Geologic Hazards Element of Shasta County's General plan. Accessed on January 18, 2024. Available online at: https://www.shastacounty.gov/planning/page/general-plan

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

NRC 2015 – Nuclear Regulatory Commission, United State Seismic Zones. dated May 8, 2015. Accessed on January 18, 2024. Available online at: https://www.nrc.gov/docs/ML1513/ML15131A128.pdf

4.2 Facility Reliability

4.2.1 Setting

Existing Conditions

The proposed Fountain Wind Project (FWP or project) would have a maximum generating capacity 205 MW. This analysis evaluates the proposed project to determine if the power generating facility would be built in accordance with typical industry norms for reliable power generation.

Regulatory

This section addresses Public Resources Code section 25520 which requires that applications for certification contain facility reliability information and Public Resources Code section 25523(h) which requires the written decision to contain a discussion on the electricity reliability benefits of the project. These two sections are made applicable to the evaluation of the FWP through Public Resources Code sections 25545.2 and 25545.8. See **Section 4.3 Transmission System Engineering** for discussion regarding the project's impacts and benefits on the reliability of the electricity network the project would serve.

4.2.2 Impacts

Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs and must achieve an availability factor similar to the existing power plant facilities in the California electricity grid system. To achieve this, this reliability analysis encompasses the following benchmarks and ensures that the project would not degrade the overall reliability of the electric system it serves:

- equipment availability;
- plant maintainability and maintenance program; and
- power plant reliability in relation to natural hazards.

Staff uses the above benchmarks as appropriate industry norms to evaluate the project's reliability and determine if its availability factor is achievable.

Equipment Availability

Equipment availability would be ensured based on several factors, including component availability from the manufacturer, turbine's operational history, on-site wind resource data, and site conditions (i.e., topographical conditions). These factors must be ensured prior to procurement, construction, and the commencement of project operations.

In addition, the project must provide adequate maintenance and repair of the equipment and systems during operations. An operation and maintenance protocol

would be implemented in accordance with the maintenance requirements prescribed by the turbine manufacturer (FWPA).

Emergency Backup Generator

A power generating facility must be capable of operating during electrical outages. The project would include a 200-kilowatt diesel-fired emergency backup generator for its operations and maintenance (O&M) building to support critical loads during electrical outages.

Plant Maintainability and Maintenance Program

Equipment manufacturers provide maintenance recommendations for their products, and power plant owners develop their plant's maintenance program based on those recommendations. Such a program encompasses both preventive and predictive maintenance techniques. The project would develop its maintenance program in the same way and would implement a Supervisory Control and Data Acquisition (SCADA) monitoring system which monitors and communicates between the turbines, substation, and O&M building. The SCADA would be used to monitor turbines 24 hours per day, 365 days per year, via a Remote Operation Control Center (ROCC). The ROCC would be able to perform self-diagnostics tests, systems check, and monitor turbine operating performance. This system would minimize turbine failure and ensure that the project operates efficiently and reliably.

Power Plant Reliability in Relation to Natural Hazards

Natural forces can threaten the reliable operation of a power plant. For this project, seismic shaking (earthquakes) and landslides could present credible threats to the project's reliable operation.

Seismic Shaking

Seismic events affect the entire Northern California region, including the project site. The project site is located approximately 2 miles east of the Hatchet Ridge Fault Zone; see **Geology and Paleontology**. The fault is not considered active and the possibility of ground rupture along this fault at the site is deemed low.

The project would be designed and constructed to meet the latest applicable engineering codes. Compliance with the latest seismic design requirements represents an upgrading of performance during seismic shaking compared to older facilities since these requirements have been continually upgraded and made more stringent. Because the project would be built to the latest seismic design requirements, it would be expected to perform better than the older existing power plants in California electricity grid system.

Landslides

Landslide events affect the county, including the project site. The County's General Plan mentions that landslides have occurred throughout the county. There is potential for

landslides or other ground failures (see **Geology and Paleontology**, subsection iv. Landslides for further discussion).

A design-level geotechnical investigation would analyze site-specific conditions, including any potential for landslides or other slope instability. Compliance with CBC requirements, including recommendations provided in the geotechnical investigation's report, through the CEC's delegate chief building official's review and inspection process, would ensure impacts related to landslides would be less than significant.

Lightning Strikes

Lightning does strike wind turbine blades often due to their proximity to low-level clouds. Although lightning strikes occur, there are mitigations that ensure the strikes would not significantly damage the wind turbines. Standards, such as the International Electrotechnical Commission's IEC 61400-1 Wind Generation System – Part 1: Design Requirements and IEC 61400-24 Part 24: Lightning Protection, require lightning protection for wind turbines and their components. These protections include installing lightning down conductors and receptors in the turbine's rotor blades to discharge lightning current safely to the ground, and incorporating a combination of bonding, shielding and surge protection devices for the turbine's electrical system. In addition to protecting the turbine, external transformers and switchgears would also require lightning protection. In light of this, damages to wind turbines would not be significant and maintenance downtime would be reduced.

CEC staff proposes Conditions of Certification (COCs) to ensure the project complies with these requirements; see **Geology and Paleontology COC GEO-1** (Soils Engineering Report, addressing potential for strong seismic shaking; liquefaction; and landslides) and **Facility Design COCs GEN-1** (final design, construction, and on-site inspection of the project) and **GEN-5** (requiring registered engineers to oversee design and construction of the project). These COCs include standard engineering design requirements for mitigation of strong seismic shaking, liquefaction, and potential excessive settlement due to dynamic compaction. CEC staff concludes these COCs adequately mitigate potentially significant impacts associated with the project's functional reliability due to seismic shaking and landslides.

Comparison with Existing Facilities

The equivalent availability factor (availability factor) of a power plant is the amount of time the plant is able to produce electricity over a certain period, divided by the amount of time in the period in which the generation resource is available. Wind turbines typically have an availability factor of 98 percent (Northland 2024 and WES 2024). This availability factor is higher than most other existing power plant facilities. According to the North American Electric Reliability Corporation (NERC), the average availability

factor for all fossil-fueled, hydroelectric, pump storage, geothermal, and nuclear-fueled power plants in North America in 2022 was approximately 80 percent (NERC 2022).

The applicant has indicated in its project description that the proposed project has an expected capacity factor, or percentage of time operating at maximum output, of 26-32 percent. Data from the CEC's wind database shows this range is similar to some other wind farms, including the nearby Hatch Project which had a 2022 capacity factor of 31 percent. The best performing wind farms in the state, located in the Tehachapi, Monterey, Altamont, San Gorgonio, and San Diego can hit an annual capacity factor of 40-50 percent (CEC).

4.2.3 Applicable LORS and Project Conformance

No federal, state, or local regulations related to facility reliability apply to the project.

4.2.4 Conclusions and Recommendations

Staff concludes that the project would be built to operate in a manner consistent with industry norms for reliable operation and would be expected to demonstrate a high availability factor although a lower capacity factor compared to other facilities within the state. No conditions of certification are proposed for power plant reliability.

4.2.5 Proposed Conditions of Certification

There are no proposed conditions of certification for facility reliability.

4.2.6 References

CEC – California Energy Commission (CEC). Visualization of Seasonal Variation in California Wind Generation. Accessed July 2024. Available online at: https://repository.energy.ca.gov/3D_Visualizations/2014-2022_Monthly_Visualization/2014-2022_monthly.html

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2024 – Shasta County. Shasta County General Plan, Seismic and Geologic Hazards. Accessed on February 13, 2024. Available online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3048/51seismic.pdf

NERC 2022 – North American Electric Reliability Corporation (NERC). Generating Unit Statistical Brochures. Accessed on January 18, 2024. Available online at: https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx

Northland 2024 – Northland Power. Wind power is here. Accesses on: January 3, 2024. Available online at: https://www.northlandpower.com/en/resourcesGeneral/ProjectDocuments/Grand%20Bend/3_wind_power_is_reliable.pdf

WES 2024 – Wind Energy Solutions (WES). Availability Explained. Accessed on January 18, 2024. Available online at: https://windenergysolutions.nl/blog/availability-explained

4.3 Transmission System Engineering

4.3.1 Setting

Existing Conditions

The applicant has proposed to interconnect the 205 MW (nameplate capacity) Fountain Wind Project (FWP or project) to the new Pacific Gas and Electric Company (PG&E) switching station which would loop-in the Cottonwood – Pit #1 230 kV line. The FWP would be a wind power generation facility including up to 48 wind turbine generators, 34.5 kilovolt (kV) overhead and underground collector lines, and a new project substation. The PG&E new switching station would be next to the project substation. The proposed Commercial Operation Date has been extended to September 15, 2027 (Stantec TN 256613). The FWP would be located in an unincorporated area of Shasta County, California.

Project Description

The project would use three-bladed, horizontal-axis turbines, and nacelles contain an electrical generator which mounted on the top of each cylindrical tower. The wind turbine, rated up to 7.2 MW each, would convert wind energy directly to electrical power. Power would be collected from the 34.5 kV collection system and would be step-up to 230 kV via 13.8/34.5/230 kV 3-winding transformers rated at 110 MVA.

Approximately 39 miles of underground collector lines and 6 miles of overhead collector lines would be built to transfer the 34.5 kV electrical power to the project substation. The 34.5 kV underground collector lines would be insulated cables buried in trenches that would be 46 inches deep and at least 12 inches wide. Each trench would contain power cables using aluminum conductor, ground wire, and fiber optic communication cable. The 34.5 kV overhead collector lines would be supported by wood poles with a maximum height of 90 feet. The ground clearance would be between 20 and 30 feet (FWPA TN 251663).

Project Substation, Switching Station and Interconnection Facilities

The project substation would contain two buses, four 34.5 kV collector circuits, two 13.8/34.5/230 kV 3-winding step-up transformers, circuit breakers rated at 2000 A, and disconnect switches rated at 2000 A. One 230 kV generator tie-line interconnecting the project substation to the PG&E switching station would be built using a 1590 kcmil Falcon ACSR conductor. The line would be supported by steel pole structures.

The new PG&E Switching Station located next to the project substation, approximately 38.7 miles from the Cottonwood Substation and approximately 21 miles from the Pit #1 Substation, would be built in a breaker-and-a-half configuration. The existing Cottonwood-Pit #1 230 kV line would be extended and looped into the new switching station via four new tubular steel poles approximately 125 feet height. An existing

transmission tower would be removed. The project 230 kV overhead generator tie-line would connect the switching station and the project substation. Power would be delivered to the PG&E transmission system from the new switching station via the 230 kV Cottonwood-Pit #1 line.

Regulatory

Federal/Regional

- The North American Electric Reliability Council's (NERC) Reliability Standards for the bulk electric transmission systems of North America provide national policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. The NERC planning standards provide for system performance levels for both normal and contingency conditions. With regard to power flow and stability simulations, while these Standards are similar to NERC/WECC Planning Standards, certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards for Transmission System Contingency Performance. The NERC's planning standards apply not only to interconnected system operation but to individual service areas as well (NERC 2024 and ongoing).
- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the NERC Reliability Standards to provide the system performance standards used to assess the reliability of the interconnected system. These standards require the uninterrupted continuity of service as their first priority, and the preservation of interconnected operation as their secondary priority. Some aspects of NERC/WECC standards are more stringent or specific than NERC standards alone. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree upon Section I.A of the standards, *NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table* and on Section I.D, *NERC and WECC Standards for Voltage Support and Reactive Power.* These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying allowable variations in thermal loading, voltage and frequency, and the loss of load that could occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as the loss of either multiple 500 kV lines along a common right-of-way, and/or the loss of multiple generators). While controlled loss of generation or load or system separation is permitted under certain circumstances, uncontrolled loss is not permitted (WECC 2014 and ongoing).

State

- California Public Utilities Commission (CPUC) General Order 95 (GO-95*), Rules for Overhead Electric Line Construction,* sets forth uniform requirements for the construction of overhead lines. Compliance with this order ensures both adequate service and the safety of both the public and the people who build, maintain, and operate overhead electric lines.
- CPUC General Order 128 (GO-128), *Rules for Construction of Underground Electric Supply and Communications Systems*, sets forth uniform requirements and minimum standards for underground supply systems to ensure adequate service and the safety of both the public and the people who build, maintain, and operate underground electric lines.
- California Independent System Operator (California ISO) Planning Standards also provide standards and guidelines that assure the adequacy, security and reliability during the planning process of the California ISO's electric transmission facilities. The California ISO Planning Standards incorporate both NERC and WECC Planning Standards. With regard to power flow and stability simulations, the California ISO's Planning Standards are similar to those of the NERC and WECC and to the NERC Planning Standards for transmission system contingency performance. However, the California ISO's standards also provide additional requirements that are not found in the NERC, WECC, or NERC planning standards. The California ISO standards apply to all participating transmission owners that interconnect to both the California ISO-controlled transmission grid and to neighboring grids not operated by the California ISO (California ISO 2023a).
- California ISO and Federal Energy Regulatory Commission (FERC) electric tariffs provide guidelines for the construction of all transmission additions and upgrades (projects) within the California ISO-controlled grid. The California ISO also determines the "need" for the proposed project where it will promote economic efficiency and maintain system reliability. The California ISO also determines the cost responsibility of the proposed project and provides operational review for all facilities that are to be connected to the California ISO grid (California ISO 2024a).

General

- National Electric Safety Code, 2023, provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.

4.3.2 Impacts

This analysis evaluates whether the proposed project's interconnection conforms to all LORS required for safe and reliable electric power transmission. Additionally, under CEQA, the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Title 14, California Code of Regulations §15378).

For the interconnection of either a proposed generating unit or transmission facility to the grid, the interconnecting utility (PG&E in this case) and the control area operator (California ISO) are jointly responsible for ensuring the grid's reliability. To ensure grid reliability, PG&E and the California ISO, determine the transmission system impacts of the proposed project and any mitigation measures needed to ensure system conformance with utility reliability criteria, NERC planning standards, WECC reliability criteria, and the California ISO reliability criteria. Phase I and Phase II Interconnection Studies are used to determine the impacts of the proposed project on the transmission grid. Staff relies on these studies and any review conducted by the California ISO to determine the project's effect on the transmission grid and to identify whether downstream impacts or indirect project impacts would require additional equipment or strategies to bring the transmission network into compliance with applicable reliability standards.

The Phase I and Phase II Interconnection Studies analyze the grid both with and without the proposed project, under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation, and are thus based upon a forecast of loads, generation, and transmission. Load forecasts are developed by the Energy Commission, the interconnecting utility and the California ISO. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads, or cascading outages), and short circuit duties.

If the studies show that the interconnection of the project could cause the grid to be out of compliance with reliability standards, then the study will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. When a project connects to the California ISO-controlled grid, both the studies and mitigation alternatives must be reviewed and approved by the California ISO. If the mitigation identified by the California ISO or interconnecting utility includes transmission modifications or additions that require CEQA review, these additions are considered part of the "whole of the action," in conjunction with the proposed power plant. The Energy Commission must then analyze the environmental impacts of these modifications or additions.

4.3.2.1 Scope of the Queue Cluster Interconnection Study Reports and The Interconnection Reassessment Study Reports

The Queue Cluster Phase I and Phase II Interconnection Studies and the Interconnection Reassessment Study Reports were performed by the California ISO and PG&E at the request of the project owners, to identify transmission system impacts caused by all the projects in cluster window.

In 2016, the FWP along with other projects were studied in the Queue Cluster 8 Phase I and Phase II Interconnection Studies. In the Cluster 8 Phase I PG&E North Interconnection Area, including the FWP, there were 18 proposed generation projects totaling 845.64 MW maximum output to the transmission grid. The power flow cases also included all California ISO approved transmission projects, earlier queued Serial Group and cluster generation projects and their associated Network Upgrades and Special Protection Systems (SPS).

The Queue Cluster 8 Phase I Interconnection Study Report consists of two major assessments: Reliability Assessment and Deliverability Assessment. The Reliability Assessment included a Steady State Power Flow Analyses, Voltage Assessment, Transient Stability Analysis, Post-Transient Stability Analyses, Reactive Power Deficiency Analyses, Short Circuit Duty Analyses. The Deliverability Assessment consists of On-Peak Deliverability Assessment and Off-Peak Deliverability Assessments (Stantec TN 252392, Stantec TN 251251).

Due to project schedule delays, and requests by the FWP, California ISO and PG&E performed three Interconnection Reassessment Study Reports as addendums to the Cluster 8 Phase II Interconnection Study Report. Detailed information is as shown in the following Table 1 (Stantec TN 251250).

TABLE 4.3-1 INTERCONNECTION STUDY DOCUMENT HISTORY

No.	Date	Document Title	Description of Document
5	7/31/2019	2019 Interconnection Reassessment Study Report - **Addendum #3** to the Cluster 8 Phase II Interconnection Study Report.	Performed a reassessment prior to the beginning of the Queue Cluster 11 (QC11) Phase II Interconnection Study.
4	7/31/2018	2018 Interconnection Reassessment Study Report - **Addendum #2** to the Cluster 8 Phase II Interconnection Study Report.	Performed a reassessment prior to the beginning of the Queue Cluster 10 (QC10) Phase II Interconnection Study.
3	7/31/2017	2017 Interconnection Reassessment Study Report - **Addendum #1** to the Cluster 8 Phase II Interconnection Study Report.	Performed a reassessment prior to the beginning of the Queue Cluster 9 (QC9) Phase II Interconnection Study.
2	11/22/2016	Queue Cluster 8 Phase II Report	To determine the combined impact of Queue Cluster 8 projects on the CAISO controlled grid.
1	1/15/2016	Queue Cluster 8 Phase I Report	To determine the combined impact of Queue Cluster 8 projects on the CAISO controlled grid.

The 2019 Interconnection Reassessment Study Report – Addendum #3 was performed prior to the beginning of the Queue Cluster 11 Phase II Interconnection Study. The Reassessment included all remaining active generation projects prior to queue cluster 11, evaluated the impacts on Network Upgrades identified in earlier interconnection

studies due to generation project withdrawals, project changes and transmission upgrades approved in the most recent Transmission Planning Process cycles.

4.3.2.2 Reliability Assessment Results

Steady State Reliability Thermal Loading Assessment Results

The reliability thermal loading assessment and bus flow analysis did not identify any Reliability Network Upgrades necessary for this project. No normal and contingency transmission line overload, buses, and switching devices overload was identified due to the project (Stantec TN 251251).

Steady State Voltage Assessment Results

The addition of the FWP would not cause any voltage violations to the transmission system.

Transient and Post-Transient Stability Analysis

Both Transient and post-transient stability analysis identified no mitigations required for the FWP in both summer peak and spring off-peak conditions.

Reactive Power Deficiency Analysis

No reactive power deficiency was identified due to the addition of the FWP.

Short-Circuit Duty Analysis

Addition of the FWP would overstress circuit breakers at the Cottonwood 230 kV substation. Replacement of circuit breaker 522 and 542 would be required.

4.3.2.3 Deliverability Assessment Results

On-Peak Deliverability Assessment
The Study identified that the addition of the FWP would cause thermal overloads on the following 230 kV lines in the event of a contingency:

- FWP Switching Station - Cottonwood 230 kV,
- Carberry Switching Station – Round Mountain 230 kV line,
- Pit #3 - Carberry Switching Station 230 kV Line.

To mitigate the deliverability thermal overloads, FWP would be required to participate in the QC8RAS-02 Special Protection System (SPS) to trip the FWP generation.

4.3.3 Applicable LORS And Project Conformance

Table 4.3-2 contains staff's determination of conformance with applicable general, local, state and federal/regional LORS, including any proposed Conditions of Certification to ensure the project would comply with LORS. As shown in this table, staff

concludes that with implementation of specific Conditions of Certification, the proposed project would be consistent with all applicable LORS. The subsection at the end of this section, "Staff Proposed Conditions of Certification," contains the full text of the referenced Conditions of Certification.

TABLE 4.3-2 COMPLIANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal/Regional	
Federal Energy Regulatory Commission (FERC) /North American Electric Reliability Council (NERC)	**Yes.** The proposed interconnection facilities would comply with Federal/Regional regulations. Conditions of Certification (COC) TSE-5 would require the submittal of any updates to the LGIA at least 30 days prior to the start of construction of transmission facilities.
NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards	**Yes.** The proposed interconnection facilities would comply with Federal/Regional regulations. Conditions of Certification (COC) TSE-5 would require the submittal of any updates to the LGIA at least 30 days prior to the start of construction of transmission facilities.
State	
California Public Utilities Commission (CPUC) General Order 95 (GO-95)	**Yes.** The proposed overhead collector lines and generator tie-line would comply with CPUC GO-95. Compliance with COC TSE-4 requires power plant switchyard, outlet line, and termination compliance with GO-95.
CPUC General Order 128 (GO-128)	**Yes.** The proposed underground collector lines would comply with CPUC GO-128. Compliance with COC TSE-4 requires power plant switchyard, outlet line, and termination compliance with GO-128.
California ISO Planning	**Yes.** The proposed interconnection of the project would comply with California ISO planning standards. Conditions of Certification (COC) TSE-5 would require the submittal of any updates to the LGIA at least 30 days prior to the start of construction of transmission facilities.
General	
National Electric Safety Code 2023 (NESC)	**Yes.** The proposed overhead collector lines, underground collector lines, and generator tie-line would comply with NESC. Compliance with COC TSE-4 requires power plant switchyard, outlet line, and termination compliance with NESC.

4.3.4 Conclusions and Recommendations

As discussed above, with implementation of Conditions of Certification, the project would have a less than significant impact related to transmission system engineering and would conform with applicable LORS. Staff recommends adopting the Conditions of Certification as detailed in subsection "4.3.5 Proposed Conditions of Certification" below.

4.3.5 Proposed Conditions of Certification

The following proposed Condition of Certification include measures to ensure conformance with applicable LORS.

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: Prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1**: Major Equipment List below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up transformer
Switchyard
Busses
Surge arrestors
Disconnects
Take-off facilities
Electrical control building
Switchyard control building
Transmission pole/tower
Grounding system

TSE-2 Before the start of construction, the project owner shall assign to the project an electrical engineer and at least one of each of the following:

a. a civil engineer;

b. a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

c. a design engineer who is either a structural engineer or a civil engineer and fully competent and proficient in the design of power plant structures and equipment supports; or

d. a mechanical engineer (Business and Professions Code Sections 6704 et seq. require state registration to practice as either a civil engineer or a structural engineer in California).

The tasks performed by the civil, geotechnical, mechanical, electrical, or design engineers may be divided between two or more engineers as long as each engineer is responsible for a particular segment of the project, e.g., proposed earthwork, civil structures, power plant structures, or equipment support. No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical, or civil and design engineer, assigned as required by Facility Design Condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO, for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earth work and require changes if site conditions are unsafe or do not conform with the predicted conditions used as the basis for design of earth work or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and
2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: Prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. The

discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and refer to this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for the disapproval, along with the revised corrective action required to obtain the CBO's approval.

TSE-4 For the collector lines and cables, power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the monthly compliance report:

a. receipt or delay of major electrical equipment;

b. testing or energization of major electrical equipment; and

c. the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: Prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, and outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the CBO. Once approved, the project owner shall inform the CPM and CBO of any anticipated changes to the design, and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

a. The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code of Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", National ElectricCode (NEC), related industry

standards, and the California Independent System Operator (California ISO) Interconnection Procedures.

b. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

c. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

d. The project conductors shall be sized to accommodate the full output of the project.

e. Termination facilities shall comply with applicable PG&E interconnection standards.

f. The project owner shall provide to the CPM:

   i. The Special Protection System (SPS) sequencing and timing if applicable,

   ii. A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable, if applicable,

   iii. Any updates to the executed LGIA signed by the California ISO, PG&E and the project owner.

Verification: Prior to the start of construction or start of modification of transmission facilities, the project owner shall submit to the CBO for approval:

a. Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, CA ISO standards, National Electric Code (NEC) and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.

b. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, California ISO standards, National Electric Code (NEC), and related industry standards.

1 Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

c. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by requirements **TSE-5** a) through f).

d. Generator Special Facilities Agreement shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO and CPM approval.

e. Any changes or updates to the executed LGIA signed by the California ISO, PG&E, and the project owner.

f. Prior to the start of construction of any project modification requiring approval of the California ISO, provide the interconnection approval to the CPM. Interconnectional approval for modification of existing facilities can be in the form of an approved Material Modification or approval of the proposed changes to project and the existing interconnection facilities. Within 15 days after cessation of construction the project owner shall provide a statement to the CPM from the registered engineer in responsible charge (signed and sealed) that the switchyard and transmission facilities conform to the above listed requirements.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California Transmission system:

a. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

b. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, applicable interconnection standards, NEC and related industry standards. In

case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a. "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards.

b. An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

4.3.6 References

California ISO 2023a - California ISO Grid Planning Standards, February 2, 2023, ongoing.

California ISO 2024a - California ISO, Fifth Replacement FERC Electric Tariff, January 1, 2024, ongoing.

California Public Utilities Commission (CPUC) General Order 95 (GO-95), Rules for Overhead Electric Line Construction, revised January 15, 2020, ongoing.

California Public Utilities Commission (CPUC) General Order 128 (GO-128), Rules for Construction of Underground Electric Supply and Communications Systems, revised January 2006, ongoing.

FWPA – Fountain Wind Project Application (TN 248288-1 through TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248322). Executive Summary and Project Description, dated January 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250101). PO-018_Collector_Line Route Resources, dated May 11, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250502). TSD-03 Typical Wind Farm Underground Collection Cable Types and Loadings, dated June 2, 2023. Accessed

online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250503). TSD-03 Switching Station Design Details, dated June 2, 2023. Accessed online at: Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250504). TSD-03 Substation Design Details, dated June 2, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250518). Transmission Responses, dated June 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec (TN 251249). Large Generator Interconnection Agreement, dated June 21, 2023. Confidential Report on File.

Stantec (TN 251250). Appendix A – Q1106, 2019 Generator Interconnection Reassessment Report, Addendum #3 to the Cluster 8 Final Phase II Study Report dated July 31, 2019. Confidential Report on File.

Stantec (TN 251251). Appendix A – Q1106, Queue Cluster 8 Phase II Study Final Report, dated November 22, 2016. Confidential Report on File.

Stantec (TN 252392). Cluster 8 Phase I Interconnection Area Report – PG&E North Interconnection Area Study Report dated 1/15/2016. Confidential Report on File.

Stantec (TN 256613) Fountain Wind (Q1106) MMA#3, dated 10/31/2022. Confidential Report on File.

Stantec (TN 256614) 2019 Generator Interconnection Reassessment Study Report, PG&E North Interconnection Area, Dated 7/31/2019. Confidential Report on File.

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 252160). Fig.6 Substation Design Details, dated September 7, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

NERC (North American Electric Reliability Council) 2024 Reliability Standards for the Bulk Electric Systems of North America, Updated January 1, 2024 and ongoing.

WECC (Western Electricity Coordinating Council), WECC Regional Reliability Standards, Updated on December 10, 2014 and ongoing.

4.3.7 Definition of Terms

AAC — All aluminum conductor

ACSR — Aluminum conductor steel-reinforced

ACSS — Aluminum conductor steel-supported

Ampacity — Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations

Ampere — The unit of current flowing in a conductor

Bundled — Two wires, 18 inches apart

Bus — Conductors that serve as a common connection for two or more circuits

Conductor — The part of the transmission line (the wire) that carries the current.

Congestion Management — A scheduling protocol that ensures dispatched generation and transmission loading (imports) will not violate criteria

Double Contingency — Also known as emergency or N-2 condition, occurs when a forced outage of two system elements occurs -- usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker

Emergency Overload — See Single Contingency condition. This is also called an N-1.

Kcmil or KCM — Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV) — A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground

Loop — An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection, and returns it back to the interrupted circuit, thus forming a loop or cul de sac

Megavar — One megavolt ampere reactive

Megavars — Mega-volt-ampere-reactive. One million volt-ampere-reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system

Megavolt Ampere (MVA)
: A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, divided by 1,000

Megawatt (MW)
: A unit of power equivalent to 1,341 horsepower

N-0 Condition
: See Normal Operation/Normal Overload, below

Normal Operation/ Normal Overload (N-0)
: When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating

N-1 Condition
: See Single Contingency, below

N-2 Condition
: See Double Contingency, above

Outlet
: Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities with the main grid

Power Flow Analysis
: A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels

Reactive Power
: Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system

Remedial Action Scheme
: A remedial action scheme is an automatic control provision that, as one example, will trip a selected generating unit when a circuit overloads

SF6
: Sulfur hexafluoride is an insulating medium

Single Contingency
: Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service

Solid Dielectric Cable
: Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket

Special Protection Scheme/System
: Detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and then trips or runs back generation output to avoid potential overloaded facilities or other criteria violations

Switchyard
: A power plant switchyard is an integral part of a power plant that is used as an outlet for one or more electric generators

Thermal Rating
: See ampacity.

TSE
: Transmission System Engineering

Tap
: A transmission configuration that creates an interconnection through a short single circuit to a small or medium-sized load or generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing
: A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild
: A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

4.4 Worker Safety and Fire Protection

4.4.1 Setting

Existing Conditions

The proposed Fountain Wind Project (FWP) would be located on unincorporated land in Shasta County to the west of the town of Burney. The project site would be served by the Shasta County Fire Department (SCFD) and by the California Department of Forestry and Fire Protection (CAL FIRE) as a jointly run entity under a single Fire Chief and administrative network due to a contract between Shasta County and CAL FIRE. The FWP would be served first by the nearest two SCFD stations, staffed by volunteer fire fighters, 71 (Montgomery Creek) and 30 (Oak Run) if the emergency involved only structures on the site including wind turbine fires. The SCFD rural stations are not adequately staffed and do not meet minimum staffing requirements (CEC 2024g TN254837). However, stations currently are adequately equipped with vehicles (cars, engines, trucks, dozers, water tenders, rescue equipment, and Emergency Medical Response [EMS] vehicles) (CEC 2024g TN 254837); Shasta County Fire Department 2023). The same holds true for the nearby jurisdictions which would provide mutual aid and automatic aid for response and back-fill when needed. The CAL FIRE stations are fully staffed and equipped but only during nine months of the year (CEC 2024g TN 254837). They are not staffed during the 3-month winter period. If both a structure and wildland fire existed, CAL FIRE Stations 74, 75, 14, 19, 34, & 35 would also be available to respond (O'Hara 2024). Services are dispatched from both the SCFD and the CAL FIRE stations according to whether a wildland fire is involved or not. The estimated response times for fire, EMS, and rescue are between 15 and 30 minutes depending on the station first responding; approximately 15 minutes from Station 75 and 30 minutes from stations 74 or 71 (CEC 2024g TN 254837). Although the SCFD is responsible for the initial first response for all HAZMAT incidents at the project site, if the spill were larger or more complex than a first responder team could handle, the Shasta Cascade Regional Hazardous Materials Team (SCRHMT), that serves Shasta, Lassen, Tehama, Modoc, Trinity, and Siskiyou Counties, would be dispatched with a response time of 1-2 hours.

Regulatory

Worker safety and fire protection are regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials and may face hazards that can result in accidents and serious injury. Protective measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment, and procedural controls.

Federal

Occupational Safety and Health Act. The Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (Title 29, Code of Federal Regulations, Section 1910.95) designed to protect workers. Employers are required to monitor worker exposure to listed hazardous substances and notify workers of exposure. The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Organized Crime Control Act of 1970. Title XI (Public Law 91-452) requires that the Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATF) regulate explosives storage and commerce under Title XI of the Organized Crime Control Act. The BATF regulations that enforce the Organized Crime Control Act of 1970, Title XI governing the explosives industries include Title 27 CFR Chapter II, Part 555 – Commerce in Explosives. The BATF defines explosives as any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion. BATF regulation related to explosives (Title 27 CFR Chapter II, Part 555) includes requirements for use permits, labeling and storage, and reporting.

State

California Occupational Safety and Health Administration. California Occupational Safety and Health Administration (Cal OSHA) is the primary agency responsible for worker safety related to the handling and use of chemicals in the workplace. Cal OSHA standards are generally more stringent than federal regulations. Employers are required to monitor worker exposure to listed hazardous substances and notify workers of exposure (Title 8, Cal. Code Regs., §§ 337 340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. It also includes the Construction Safety Orders (Title 8, Cal. Code Regs., §§ 1500-1962) which includes regulations addressing explosives and lasting (Title 8, Cal. Code Regs., §§ 1550 – 1580), and the General Industry Safety Orders (Title 8, Cal. Code Regs., §§ 3200-6184).

California Health and Safety Code Sections 13145 and 13146 also require that every city, county, or city and county fire department or district providing fire protection services to enforce building standards adopted by the State Fire Marshal and other regulations of the State Fire Marshal.

The California Fire Code (CFC). Chapter 56 governs the possession, manufacture, storage, handling, sale, and use of explosives and explosive materials, fireworks rockets, emergency signaling devices and small arms ammunition. The fire code official is authorized to limit the quantity of explosives, explosive materials or fireworks permitted at a given location. Before approval to do blasting is issued, the applicant for approval shall file a bond or submit a certificate of insurance in such form, amount and

coverage as determined by the legal department of the jurisdiction to be adequate in each case to indemnify the jurisdiction against any and all damages arising from permitted blasting. The code includes lists of prohibited explosives, required qualifications of persons in charge of explosives, required supervision, and requirements related to location and types of explosive detonations.

Local

The SCFD follows the California Fire Code (CFC) to implement local fire protection and emergency services. Shasta County adopted County Code 16.08.010 which incorporated into the Shasta County Code of Ordinances Title 16 Buildings and Construction and 16.04.130 Fire Standards and Equipment all appropriate uniform codes listed in Sections 17922 and 18938 of the California Health and Safety Code, and in Appendix Chapter 1 of Title 24, Part 2, of the California Code of Regulations. These include the 2022 CFC (24 Cal. Code Regs. Part 9).

Cumulative

Staff reviewed the potential for the construction and operation of FWP combined with existing industrial facilities and expected new energy facilities in the vicinity to result in impacts on the fire and emergency service capabilities of the SCFD/CAL FIRE. Staff identified four energy-related projects that could cause a cumulative impact to the SCFD/CAL FIRE department. These four other projects are:

* The Anderson River Battery Energy Storage System
* The Crossroads 2 Battery Energy Storage System near Montgomery Creek
* The Meadow Ridge-2 solar PV and battery energy storage system somewhere near Round Mountain
* The Burney-Hat Creek bio energy gasification project somewhere near Burney

4.4.2 Impacts

Worker safety and fire protection are regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials and may face hazards that can result in accidents and serious injury. Protective measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment, and procedural controls.

The purpose of this Draft Environmental Impact Assessment/Preliminary Staff Assessment (DEIR/PSA) is to assess whether the worker safety and fire protection measures proposed by the Applicant are adequate to:

- comply with applicable safety Laws, Ordinances, Regulations, and Statutes (LORS);
- protect the workers during construction, commissioning, and operation of the facility;

- protect against fire; and
- provide adequate emergency response procedures.

Worker Safety

Industrial environments are potentially dangerous during construction, commissioning, and operation of facilities. Workers at the proposed FWP would be exposed to loud noises, moving equipment, trenching/excavation accidents, blasting, and working at extreme heights. The workers could experience falls, trips, burns, lacerations, being struck by objects, and numerous other potential injuries. Well-defined policies and procedures, training, and hazard recognition and control at the facility are important to minimize such hazards and protect workers. Compliance with applicable LORS would help ensure workers would be adequately protected from health and safety hazards.

A Construction Safety and Health Program and an Operations and Maintenance Safety and Health Program would be prepared by the applicant to minimize worker hazards during construction and operation. California Energy Commission (CEC) staff uses the phrase “Safety and Health Program” to refer to the measures that would be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

Construction Safety and Health Program

The proposed FWP encompasses construction and operation of multiple wind turbines and power distribution systems. Workers would be exposed to hazards typical of construction and operation of a wind turbine farm.

Construction Safety Orders applicable to project construction are promulgated by Cal OSHA and are published at Title 8, California Code of Regulations sections 1502, et seq. The Construction Safety and Health Program would include the following major programs:

- Construction Injury and Illness Prevention Program (Cal Code Regs., tit. 8, § 1509)
- Construction Fire Prevention Plan (Cal Code Regs., tit. 8, § 1920)
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 1514 — 1522)
- Construction Emergency Action Program and Plan (Cal Code Regs., tit. 8, § 3220)
- A Construction Blasting Plan (consistent with Cal Code Regs., tit. 8, §s 1550 through 1580 and 5236 through 5252).

Additional programs under General Industry Safety Orders (Cal Code Regs., tit. 8, §§ 3200 to 6184), Electrical Safety Orders (Cal Code Regs., tit. 8, §§ 2299 to 2974) include various safety and health programs.

The application did not adequately outline the Construction Safety and Health Program for the project. Without identifying the proper elements of the program, the project owner has failed to demonstrate that they would have a compliant program in place. Therefore, staff proposes Condition of Certification (COC) **WORKER SAFETY-1** which would require the project owner to identify and provide the required elements and detailed plans of the Construction and Health Safety Program to the Compliance Project Manager (CPM) for approval and the SCFD for review and comment prior to the start of construction of the project.

One of the safety programs the applicant has identified and described in a response to an informal data request (CEC 2024p TN258069) addresses the need for workers or contractors to gain access to the turbines and safety measures to be followed during construction, commissioning, and operations. Access inside the wind turbines will be required at different times through the construction, commissioning and operation of the facility. Access to the turbine would be through a locked door located at the base of the tower. During construction workers must access the inside of the turbine to make the bolted connections for the tower sections, nacelle and the blades. Entry into the wind turbines is also frequently required during construction to perform QA/QC inspections and complete any punch list work to ensure the construction is complete. The commissioning of the wind turbines requires technicians to enter the turbine to perform tests to confirm the turbine is operating correctly and that the internal systems are properly installed. During the operation of the facility maintenance of the wind turbines takes place at predetermined intervals, usually once or twice a year whereby all important mechanical and electrical assemblies are checked.

Before a worker can access and climb up to the nacelle of a wind turbine they must be trained and certified. When climbing to the nacelle of the turbine, they will utilize a climb assist, which is a sophisticated pulley system integrated into the ladder structure of the turbine. A motor installed at the tower's base places tension on a cable loop running to a pulley, or sheave, at the top of the ladder. The motor provides enough lift to take 40-60% of the climber's weight. The climber, not the motor, determines the speed of the climb. The climber wears a step-in harness that goes around the waist and each leg, as well as over the shoulders. In the event a climber begins to fall, the separate fall arrest system will engage and safely arrest the fall so the climber can get back under control. There are multiple platforms in the wind turbine tower. A climber going up a turbine will enter the platform through a safety hatch. Once on the platform, the climber closes the safety hatch and can perform work and/or rest. Staff is satisfied with these safety measures.

Blasting can be a particular dangerous operation for workers during construction if not handled properly. The Center for Disease Control indicates that health hazards associated with blasting and the use of explosives include, but are not limited to, lung, middle ear, or eye trauma; concussion; shrapnel and blunt force injuries, limb fracture or amputation; brain injury; burns; and asthma or other conditions caused by inhalation

of dust, smoke, or toxic fumes. Additionally, accidental or improper detonation of explosives could cause major damage to equipment and structures in the blast vicinity. Blasting activities could result in sparks that could be a source of ignition of onsite vegetation.

The proposed project site is primarily underlain by volcanic rocks and blasting may be required during construction for project component excavations, including utility trenches and turbine support structure foundations. All blasting work would be conducted by a qualified, experienced, and licensed blasting contractor that would perform blasting using current and professionally accepted methods, products, and procedures to maximize safety and minimize the potential for wildfire ignition during blasting operations. As noted in **Section 5.7, Hazards and Hazardous Materials, Table 5.7-1**, only limited amounts of explosives for specific blasting activities would be stored onsite.

Operations and Maintenance Safety and Health Program

Prior to the start of commissioning and operations at FWP, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following major programs and plans:

- Injury and Illness Prevention Program (Cal Code Regs., tit. 8, § 3203)
- Fire Prevention Program (Cal Code Regs., tit. 8, § 3221)
- Fire Protection System Impairment Program (2020 NFPA 850 Section 17.4.2 & Chapter 9 California Fire Code (CFC) Sections 901.7, 901.7.1-901.7.6)
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 3401 to 3411)
- Emergency Action Plan (Cal Code Regs., tit. 8, § 3220)

In addition, the requirements under General Industry Safety Orders (Cal Code Regs., tit. 8, §§ 3200 to 6184) and Electrical Safety Orders (Cal Code Regs., tit. 8, §§2299 to 2974) would be applicable to this project. In addition, the use of herbicides to control vegetation growth near the towers would require adherence to 8 CCR 5155 and other relevant sections regarding worker exposure to toxic substances.

The application did not adequately outline the Operations and Maintenance Safety and Health Program for the project. Without identifying the proper elements of the program, the project owner has failed to demonstrate that they would have a compliant program in place. Therefore, staff proposes COC **WORKER SAFETY-2** which would require the project owner to identify and provide the required elements and detailed plans of the Operation and Maintenance Health Safety Program to the CPM for approval and the SCFD for review and comment prior to the start of construction of the project.

The measures in these plans are derived from applicable sections of state and federal law. Both safety and health programs would comprise seven more specific programs and would require the major items detailed in the following paragraphs.

Injury and Illness Prevention Program

The Injury and Illness Prevention Program (IIPP) is a key worker safety and health program that identifies the person(s) with authority and responsibility for implementing the program, ensures that employees utilize safe and healthy work practices, identifies and evaluates workplace hazards and corrects them, and implements an employee training program.

Staff proposes that the applicant submit a final IIPP to the CPM for review and approval to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (Cal Code Regs., tit. 8, § 3221). This regulation applies to all fire prevention plans required in the State of California and the requirements are detailed below:

"The following elements, at a minimum, shall be included in the fire prevention plan:

(1) Potential fire hazards and their proper handling and storage procedures, potential ignition sources (such as welding, smoking and others) and their control procedures, and the type of fire protection equipment or systems which can control a fire involving them;

(2) Names or regular job titles of those responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires; and

(3) Names or regular job titles of those responsible for the control of accumulation of flammable or combustible waste materials.

(4) Housekeeping. The employer shall control accumulations of flammable and combustible waste materials and residues so that they do not contribute to a fire emergency. The housekeeping procedures shall be included in the written fire prevention plan.

(d) Training.

(1) The employer shall apprise employees of the fire hazards of the materials and processes to which they are exposed.

(2) The employer shall review with each employee upon initial assignment those parts of the fire prevention plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept in the workplace and made available for employee review. For those employers with 10 or fewer employees, the plan may be communicated orally to employees and the employer need not maintain a written plan.

(e) Maintenance. The employer shall regularly and properly maintain, according to established procedures, equipment and systems installed in the workplace to prevent accidental ignition of combustible materials."

Staff proposes that the applicant submit a final Fire Prevention Plan to the CPM for review and approval and to the SCFD for review and comment to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Fire Protection System Impairment Program

NFPA 850 and the most current CFC lay out a prescriptive method that the project owner must follow when the facility's installed fire protection system is impaired. The plan would accomplish the following:

- supervise the safe shutdown of fire protection systems;
- provide notifications to the proper authorities and representatives;
- control potential fire hazards during the impairments through the use of fire watches and/or evacuation of the area effected;
- outline a repair strategy and timeline to get the fire protection system operational; and,
- restore the fire protection system to service as soon as possible.

The Fire Protection System Impairment Program would ensure that the project owner follows the prescriptive measures laid out in NFPA 850 and the CFC. Therefore, staff proposes that the applicant submit a final Fire Protection System Impairment Program to the CPM for review and approval, and to the SCFD for review and comment, to satisfy proposed COC **WORKER SAFETY-2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation, or physical contact (Cal Code Regs., tit. 8, §§ 3380 to 3400).

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and would carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal OSHA standards. Each employee must be provided with the following information pertaining to, among other requirements, the use and maintenance of protective clothing, when to use the protective equipment, and when and how to replace the protective clothing and equipment.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards.

CEC staff proposes that the applicant submit a final PPE Program to the CPM for review and approval to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Emergency Action Plan

California regulations require an Emergency Action Plan (Cal Code Regs., tit. 8, § 3220).

An Emergency Action Plan must be designed to accomplish the following:

- establish emergency escape procedures and emergency escape route for the facility;
- determine procedures to be followed by employees who remain to operate critical project operations before they evacuate;
- provide procedures to account for all employees and visitors after emergency evacuation of the project has been completed;
- specify rescue and medical duties for assigned employees;
- identify fire and emergency reporting procedures to regulatory agencies;
- develop alarm and communication system for the facility;
- establish a list of personnel to contact for information on the plan contents; and,
- determine and establish training and instruction requirements and programs.

CEC staff proposes that the applicant submit a final Emergency Action Plan to the CPM for review and approval and to the SCFD for review and comment to satisfy proposed COC **WORKER SAFETY-1** and COC **WORKER SAFETY-2**.

Written Safety Program

Additional LORS called *safe work practices* apply to the project. The construction and operations safety programs would address safe work practices. The components of these programs include, but are not limited to, the programs found in the subsection "Construction Safety and Health Program" in this **Worker Safety and Fire Protection** section.

Safety & Health Program Monitoring

Protecting construction workers from hazards is among the greatest challenges in occupational safety and health. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the construction of wind turbines. The standard industry practice of hiring a Construction Safety Supervisor is used to ensure a safe and healthful environment for personnel.

This standard practice has reduced and/or eliminated hazards evident in the audits staff conducted of projects under construction. The federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors in four areas:

- to improve their safety and health performance;
- to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between, and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections;
- to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and,
- to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal OSHA regulations do, however, require that safety be provided by an employer and the term *Competent Person* used in many OSHA and Cal OSHA standards, documents, and directives. A Competent Person is usually defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, to meet the intent of the OSHA standard to provide for a safe workplace during construction, CEC staff proposes COC **WORKER SAFETY-3,** which would require the project owner to designate and provide a site Construction Safety Supervisor.

Accidents, fires, and worker deaths are known to have occurred in the past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by staff in safety audits conducted at several projects under construction. Commonly documented findings include, but are not limited to, such safety oversights as:

- lack of posted confined space warning placards/signs;
- confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- dangerous placement of hydraulic elevated platforms under each other;

- inappropriate placement of fire extinguishers near hot work;
- dangerous placement of numerous power cords in standing water on the site, thus increasing the risk of electrocution;
- inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility, but too close to the perimeter fence; and,
- lack of adequate employee- or contractor-written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on or off site.

To reduce and/or eliminate these hazards, it is necessary for the CEC to have a professional Safety Monitor available to do on-site verification checks of ongoing compliance with Cal OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. These requirements are outlined in COC **WORKER SAFETY-4**. A Safety Monitor, hired by the project owner, yet reporting to the Delegate Chief Building Official (DCBO) and CPM, would serve as an "extra set of eyes" to ensure that safety procedures and practices are fully implemented at all projects certified by the CEC.

Fire Hazards

During construction and operation of the FWP, there is the potential for both small fires and major structural fires within a wind turbine. Electrical sparks, combustion of hydraulic fluid, mineral oil, insulating fluid, or flammable liquids, explosions, and over-heated equipment, could cause small fires. Major structural fires on the project site are unlikely to occur due to the presence of only four structures, only one of which would be occupied by project staff and thus would have internal fire detection and suppression systems. Fires and explosions of flammable welding gases or liquids are rare. Compliance with applicable LORS would be adequate to ensure protection from fire hazards related to the individual structures. The applicant plans to undertake fire prevention practices during construction and operations and prepare a project-specific Fire Prevention Plan. Access to the site for fire and other emergency vehicles shall be available at two separate locations via site personnel or locked gates. Emergency departments such as the SCFD/CAL FIRE, the Shasta County Sheriff, and the California Highway Patrol shall be given access to the locked gates via keys or any other means as described in both the construction and operations fire prevention plans described in COC **WORKER SAFETY-1** and **2**.

Staff reviewed the available technical literature that addresses the frequency and severity of wind turbine fires. These fires are typically caused by lightning strikes, mechanical failure, or maintenance actions (e.g., brake repairs, oil changes, parts replacements, etc.). Wind turbines experienced fires which made up approximately 10 to 30 percent of all wind turbine incidents in any given year between 1980 and 2012 (Uadiale 2014; You 2023). And of these turbine fires, greater than 90 percent occurred in the nacelle which contains critical parts such as the gear box, generator, controller,

and transformer. Nacelle fires in wind turbines were the second highest incident after blade failure during this period from 1980 to 2012 (Uadiale 2014). Due to the extreme height of these turbine fires and possible inclement weather, it almost always results in a total loss of the turbine (Smith and de Vries. 2004; Uadiale 2014) and many fire departments wait for the fire to burn out or for the turbine to collapse to the ground where it could more easily be extinguished (Uadiale 2014; Cooley 2024). However, this procedure increases the risk of escalation to a wildland fire. Due to this increased risk, the project would install fire detection and suppression equipment within the nacelle to provide early detection of electrical flashes, smoke, and fire. In addition, the project would build a defensible vegetation-free space around each turbine tower of at least 200-feet, see **Section 5.7, Hazards, Hazardous Materials, and Wildfire** COC **HAZ-8** for more information.

The applicant stated that the wind turbine's fire detection system would consist of redundant systems consisting of arc flash optical detectors, optical smoke detectors, and thermistor temperature sensor heat detectors (CEC 2024o TN258001). An arc detector would be utilized to detect potential fires because a light flash from an arc would be sufficient to shut down the wind turbine immediately and remove the energy source. To prevent incorrect activation of the nacelle fire suppression system, the detectors must have both a smoke and a flame/heat detection before activating the fire suppression system. Upon activation of the fire suppression system, the wind turbine would shut down automatically. Additionally, any time there is smoke detected, the project owner would get an alarm and send out personnel to verify the cause (CEC 2024o TN258001). Therefore, staff concludes that any smoke from possible nearby wildfires would not activate the fire suppression systems.

Staff reviewed the information provided by the applicant to determine if the SCFD/CAL FIRE available fire protection services and equipment would be adequate to protect workers, and to determine the project's impact on fire protection services in the area. The project would rely on both on-site fire protection systems and local fire protection services. The on-site fire protection systems provide the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the SCFD/CAL FIRE under most conditions.

Construction

During construction, portable fire extinguishers would be placed throughout the site at appropriate intervals and inside vehicles and periodically maintained; safety procedures and training would be implemented according to the guidelines of the Construction Fire Protection and Prevention Program which would be reviewed for comment by SCFD/CAL FIRE and approved by the CPM.

Operation

Fire suppression elements in the proposed FWP would include both fixed and portable fire extinguishing systems. The applicant has proposed the placement of several 5,000-gallon water tanks that would be located around the site plus an additional water tank or new water supply well to be located adjacent to the operations and maintenance building which would need to be equipped with an automatic fire suppression system. The source of the water for the fire suppression system has not been established although the applicant has proposed either an on-site well or trucking of water from Redding or Burney (Stantec 2024p TN254794). To address this matter, staff proposes COC **WORKER SAFETY-7** which would require the project owner to consult with SCFD/CAL FIRE on a plan to provide an adequate reliable source of water consistent with the applicable provisions of the CFC for an automatic fire suppression system. The building would also be required to be fitted with a detection system as per CFC section 907. In addition to the fixed fire protection system, appropriate class of service portable extinguishers would be available throughout the site. Staff has determined that the fire suppression elements described above along with compliance with COC **WORKER SAFETY-7** would ensure adequate fire protection.

In the event of wildland fires, see **Section 5.7, Hazards, Hazardous Materials, and Wildfire** for more discussion.

The FWP did not identify the National Fire Protection Association (NFPA) Standard 850 as a basis for the fire protection design of the wind turbines. NFPA 850 requires the development of a Fire Protection Design Basis Document that identifies relevant hazards such as the presence of fuels, lubricating oils, flammable liquids, and electrical equipment. This document would establish how installations would be protected and also contains a chapter for the recommended practices for fire protection of wind turbines (chapter 13: *Wind Turbines recommended practices for fire protection*). This section also addresses the important need for wind turbine lightning protection in section 13.5.2.2 which refers to NFPA 780. Staff strongly recommends that FWP be built to the NFPA 850 standard. The Delegate Chief Building Official (DCBO) would be instructed to apply NFPA 850 during construction of the project because NFPA 850 is written as a set of "recommended" practices rather than "required" ones. This would require the project's compliance with NFPA 850, giving NFPA 850 the effectiveness and clear enforceability of a building code in its application to the project. In any situations where both NFPA 850 and other state or local LORS have application, the more restrictive shall apply. Staff is proposing COC **WORKER SAFETY-6** which would clarify for all stakeholders the responsibilities of the project owner as they relate to NFPA 850.

Emergency Medical Services Response

Staff conducted a statewide survey to determine the frequency of emergency medical services (EMS) response and offsite fire-fighter response for CEC projects in California. The purpose of the analysis was to determine what impact, if any, CEC project could have on local emergency services. Staff concludes that incidents at CEC projects that

require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has a mostly volunteer fire-fighting staff, which is the case for SCFD.

Staff has also determined that the potential for both work-related and non-work-related heart attacks exists at CEC licensed projects. In fact, staff's research on the frequency of EMS response to CEC projects shows that many of the responses for cardiac emergencies involved non-work-related incidents, including those involving visitors. Staff finds that the quickest medical intervention for cardiac emergencies can only be achieved with the use of an on-site automatic external defibrillator (AED). Therefore, staff concludes that it is appropriate for the project owner to maintain an AED on site in order to treat cardiac emergencies resulting from industrial accidents or other non-work related causes.

Staff proposes COC **WORKER SAFETY-5,** which would require that this portable AED be located on site, that all employees on site during operations be trained in its use, and that supervisory workers on site during construction and commissioning also be trained in its use.

Cumulative

Staff discussed the four cumulative projects and the potential for a cumulative impact with SCFD/CAL FIRE Chief O'Hara (CEC 2024g TN 254837). Given the current existing problems staffing the mostly volunteer fire stations in the area where many of these projects would be located (including the FWP), staff has determined that there would be a significant potential for cumulative impacts to occur. The SCFD/CAL FIRE Chief stated that, under certain circumstances, its ability to respond to emergency calls would not be affected by the construction but would be impacted during operation of FWP plus the four projects. Therefore, staff determined that mitigation is required and has described that in COC **WORKER SAFETY-8**.

Staff's recommendation is consistent with past findings of a cumulative impact in need of mitigation when siting projects in large empty expanses of some of California's extremely large counties (e.g., Riverside County). As discussed above, a conversation with SCFD/CAL FIRE Chief Sean O'Hara (CEC 2024g TN 254837) identified an existing problem with staffing county fire stations with volunteer fire fighters. With the proposed construction of four additional energy-related projects, staff is proposing that funding be provided equally by the FWP plus the other projects to build a new fire house to be located at the current Mongomery Creek Fire Station (or another location to be determined by the SCFD) for the amount of $5M ($1M to be provided by the FWP and each of the other projects if built) and provide full-time staffing for an annual amount of $1.7M ($340,000 per year provided by each project) plus a cost of living increase each period as negotiated between the firefighters and Shasta County (equally shared by each project).

4.4.3 Applicable LORS and Project Conformance

Table 4.4-1 staff's determination of conformance with applicable local, state and federal LORS, including any proposed conditions of certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection at the end of this section, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 4.4-1 COMPLIANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Title 29 U.S. Code (USC) section 651 et seq (Occupational Safety and Health Act of 1970)	**Yes. WS-1** & **2** require that the project owner develop and implement occupational safety and health programs to prevent worker injuries during construction, commissioning, and operations. **WS-3** & **4** requires the project owner to implement an additional layer of worker safety during construction.
Title 29 Code of Federal Regulation (CFR) sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	**Yes. WS-1** & **2** require that the project owner develop and implement occupational safety and health programs to prevent worker injuries during construction and operations. **WS-3** & **4** requires the project owner to implement an additional layer of worker safety during construction. **WS-5** requires the project owner to implement an additional layer of worker safety during construction, commissioning, and operations.
Organized Crime Control Act of 1970, Title XI (Public Law 91-452)	**Yes. WS-1** requires that the project owner prepare and implement a Blasting Plan that conforms to this law.
State	
Title 8, California Code of Regulations (Cal Code Regs.) all applicable sections (Cal OSHA regulations) including Cal Code Regs., tit. 8, §s 1550 through 1580 and 5236 through 5252n that address blasting and explosives **California Code, Health and Safety Code - HSC § 13146.2** (a) Every city, county, or city and county fire department or district providing fire protection services required by Sections 13145 and 13146 to enforce building standards adopted by the State Fire Marshal and other regulations of the State Fire Marshal shall, annually, inspect all structures	**Yes.** Staff's assessment below recognizes and lists many of the most important Cal OSHA worker safety and health programs, and **WS-1** & **2** impose specific conditions to ensure compliance with Title 8, as well as Health & Safety Codes for Fire Protection as shown in **WS- 6** & **7**

TABLE 4.4-1 COMPLIANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
subject to subdivision (b) of Section 17921, except dwellings, for compliance with building standards and other regulations of the State Fire Marshal. **California Fire Code Chapter 56** Chapter 56 governs the possession, manufacture, storage, handling, sale, and use of explosives. The fire code official is authorized to limit the quantity of explosives permitted at a given location. The code includes lists of prohibited explosives, required qualifications of persons in charge of explosives, required supervision, and requirements related to location and types of explosive detonations.	
Local	
Uniform Fire Code as adopted into the 2022 California Fire Code and Shasta County Ordinance	**YES.** See discussion on the fire authority.
National Fire Protection Association (NFPA) 850	**YES. WS-6** requires adherence to NFPA 850 industry standard.

4.4.4 Conclusions and Recommendations

CEC staff concludes that if the project owner provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program as required by COC **WORKER SAFETY-1** and **-2** and fulfills the requirements of COC **WORKER SAFETY-3** through **-7**, the project would incorporate adequate levels of industrial safety and comply with applicable LORS.

Staff also concludes that the operation of project would present a significant impact on the local fire department and has recommended mitigation COC **WORKER SAFETY-8**.

4.4.5 Proposed Conditions of Certification

The following proposed conditions of certification include measures to ensure conformance with applicable LORS.

WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Health and Safety Program containing the following:

- a Construction Personal Protective Equipment Program;
- a Construction Exposure Monitoring Program;
- a Construction Injury and Illness Prevention Program;
- a Turbine Tower Safety Plan for workers to scale a turbine tower which shall include written reasons/circumstances to scale a turbine tower, safety measures to prevent falls, and rescue procedures should one be needed;

- a Construction Emergency Action Plan that includes a definition of "higher risk conditions", clearly states who has the authority to make the decision that this condition exists and when that condition no longer exists, a description of conditions that would result in workers either being evacuated from the entire site or moved to a safer area on the site, and when it would be safe for workers to return to work on the site;
- a Construction Fire Prevention Plan that includes methods of access for emergency responders through locked gates; and
- A Construction Blasting Plan that contains a complete description of how explosives would be safely transported and used at the site, evacuation, security and fire prevention procedures, a blasting equipment list, and procedures for notification of nearby receptors. The blasting plan shall be prepared by a qualified, experienced, and licensed blasting contractor and in compliance with appropriate federal and state regulations addressing explosives and worker safety regulations, including: the Hazards Material Transportation Act (49 U.S.C. 5101 et seq. And 49 CFR Part 171-177); the Organized Crime Control Act of 1970, Title XI (Public Law 91-452); BATF regulations (27 CFR Part 555), the California Fire Code Chapter 56 – sections 5603, 5604, and 5607, and Cal/OSHA regulations Cal Code Regs., tit. 8, §s 1550 through 1580 and 5236 through 5252). The blasting notification procedures included in the Blasting Plan shall include, but not be limited to:

  1) At least 30 days before initiation of blasting, the project owner shall notify, in writing, all residents or owners of dwellings or other structures located within a 5-mile radius (or other distance as recommended by either the SCFD/CAL FIRE Chief or the Shasta County Sheriff's Office (SCSO) of a proposed blasting activity and describing how to request and submit a pre-blasting survey. Notification shall include posting a written notice within the project site, in local newspapers, and on the Shasta County public website describing proposed blasting activities and how to obtain and submit a pre-blasting survey.

  2) The project owner shall determine the condition of the dwelling or structure and shall document any pre-blasting damage and other physical factors that could more likely than not be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

  3) Prior to finalizing the blasting plan, the project owner shall consult with jurisdictional authorities tasked with protecting waters of the state and implement avoidance and minimization measures, as required by California Department of Fish and Wildlife (CDFW), United States Army Core of Engineers (USACE), and regional water quality (Section 401)

regulatory permits prepared for the project. Such protective measures shall be included in the blasting plan and/or incorporated by reference.

The explosives and blasting safety procedures to be included in the Blasting Plan shall include, but not be limited to the following:

- using qualified, experienced, and licensed blasting contractors that shall perform blasting using current and professionally accepted methods, products, and procedures to maximize safety and minimize the potential for wildfire ignition during blasting operations;
- both the quantity and duration of on-site explosives storage shall be minimized;
- explosive products shall be managed on-site so that they are either used in the borehole, returned to the delivery vehicle, or placed in secure containers for off-site disposal;
- explosives shall be stored in an approved structure (magazine);
- explosives storage facilities shall be bullet-resistant, weather-resistant, and fire resistant;
- magazines sites shall be located in remote (out-of-sight) areas with restricted access, kept cool, dry, and well ventilated, and will be properly labeled and signed;
- blasting is prohibited during extreme fire danger periods;
- fire suppression personnel shall be posted at blast sites at all times;
- refueling of vehicles carrying explosives shall not be allowed on the project site;
- smoking shall be prohibited during the loading, transporting, unloading, and use of explosives;
- vehicles carrying explosives shall not be parked or left unattended except in designated parking areas with approval of the SCFD/CalFire Chief or State Fire Marshal;
- ignition devices shall be prohibited within 50 feet of an explosives' storage area;
- magazine sites shall be well ventilated and maintained so that they are clear of fuels and combustible materials;
- magazines shall be protected from wildfires that could occur in the immediate area;
- detonators shall be stored separately from other explosive materials;

- the most stringent spacing between individual magazines will be determined according to the guidelines contained in the BATF publication or state or local explosive storage regulations;
- all active blast zones shall have clear warning signs located at key access points to ensure the public does not accidently enter a blast zone;
- the blasting contractor shall use a signaling system to alert all onsite workers of an impending blast;
- following detonation, the blasting area shall be inspected for undetonated or misfired explosives;
- appropriate practices shall be developed and implemented to prevent misfires;
- the blasting area shall also be inspected for hazards such as falling rock and rockslides;
- special attention shall be given to preventing potential hazards in the blasting area resulting from flying rock, destabilized walls, structures, presence of low flying aircraft, and dispersion of smoke and gases;
- loaded explosives shall be detonated as soon as possible and shall not be left in the blast holes overnight, unless weather or other documented safety concerns reasonably dictate that detonation should be postponed; and
- explosives shall be loaded to maintain good continuity in the column load to promote complete detonation. Industry accepted loading practices for priming, stemming, decking and column rise shall be attended to.

The Personal Protective Equipment Program, the Exposure Monitoring Program, the Turbine Tower Safety Plan, the Blasting Plan, the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety orders. The Blasting Plan, Construction Emergency Action Plan, and the Fire Prevention Plan shall be submitted to the Shasta County Fire Department/CAL FIRE for review and comment prior to submittal to the CPM for approval. In addition, the Blasting Plan shall be submitted to the Shasta County Sheriff's Office for review and comment.

Verification: At least 90 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction and Safety and Health Program. The project owner shall provide to the CPM a copy of letters from the SCFD/CAL FIRE detailing resolved comments on the Construction Fire Prevention Plan and the Emergency Action Plan a copy of the letters from Shasta County Sheriff's Office and SCFD/CAL FIRE stating the resolution of any comments or modifications to the Blasting Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following items:

- an Operation Injury and Illness Prevention Plan;

  an Emergency Action Plan that includes a definition of "higher risk conditions", clearly states who has the authority to make the decision that this condition exists and when that condition no longer exists, a description of conditions that would result in workers either being evacuated from the entire site or moved to a safer area on the site, and when it would be safe for workers to return to work on the site; and;
- a Hazardous Materials Management Program;
- a Turbine Tower Safety Plan for workers to scale a turbine tower which shall include written reasons/circumstances to scale a turbine tower, safety measures to prevent falls, and rescue procedures should one be needed;
- a Fire Prevention Plan (Cal Code Regs., tit. 8, § 3221) that includes methods of access for emergency responders through locked gates and procedures that ensure that under any circumstances of turbine fire(s), fire-involved turbine(s) shall immediately be de-energized (shut down) and locked-out and that immediate notice of that shutdown and lock-out be given to SCFD/CAL FIRE;
- a Fire Protection System Impairment Program; and
- a Personal Protective Equipment Program (Cal Code Regs, tit.8, §§ 3401—3411).

The Operation Injury and Illness Prevention Plan, Hazardous Materials Management Program, Emergency Action Plan, Fire Prevention Plan, Fire Protection System Impairment Program, the Turbine Tower Scaling Safety Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and approval concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan, Fire Protection System Impairment Program, and the Emergency Action Plan shall also be submitted to the SCFD/CAL FIRE for review and comment.

Verification: At least 30 days prior to the start of commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy to the CPM of letters from the SCFD/CAL FIRE detailing the resolved comments on the Operations Fire Prevention Plan, Fire Protection System Impairment Program, and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of

wind turbine construction activities and relevant worker safety-related LORS, including blasting activities. The CSS shall be capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to ensure compliance and mitigate hazards. The CSS shall:

- have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- ensure that the safety program for the project complies with Cal OSHA and federal regulations related to wind turbine/heavy industrial projects;
- ensure that all construction and commissioning workers and supervisors receive adequate safety training;
- conduct accident and safety-related incident investigations and provide emergency response reports for injuries, and inform the CPM of safety-related incidents; and,
- ensure that all the plans identified in COC **WORKER SAFETY-1** and **-2** are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the CSS. The contact information of any replacement CSS shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report (MCR) a monthly safety inspection report to include:

- a record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- summary report of safety management actions and safety-related incidents that occurred during the month;
- report of any continuing or unresolved situations and incidents that may pose danger to life or health;
- report of any visits from Cal OSHA and/or any complaints from workers to Cal OSHA; and,
- report of accidents, injuries, and near misses that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the DCBO for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the DCBO. Those services shall be in addition to other work performed by the DCBO. The Safety Monitor shall be selected from an independent company not affiliated with the DCBO and report directly to the DCBO and will be responsible for verifying that the CSS, as required in COC **WORKER SAFETY-3**, implements all appropriate Cal OSHA and

CEC safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 60 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable AED is located on site during construction, commissioning, and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functional. During construction and commissioning the following persons shall be trained in its use and shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate, the CSS or delegate, and all shift foremen. During operations, all project employees on site shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable AED is available to be made available on site as soon as physically possible along with a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 The project owner shall adhere to all applicable provisions of the latest version of NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations, as the minimum level of fire protection. The project owner shall interpret and adhere to all applicable NFPA 850 recommended provisions and actions stating “should” as “shall.” In any situations where both NFPA 850 and the state or local LORS have application, the more restrictive shall apply.

Verification: The project owner shall ensure that the project adheres to all applicable provisions of NFPA 850. At least 90 days prior to the start of construction of the fire protection system, the project owner shall provide all fire protection system specifications and drawings to the SCFD/CalFire for review and comment, to the CPM for review and approval, and to the DCBO for plan check approval and construction inspection.

WORKER SAFETY-7 The project owner shall consult with SCFD/CAL FIRE in preparing the fire protection system specifications and drawings for the Operations and Maintenance Building to ensure an adequate water supply for the fire suppression systems.

Verification: At least 60 days prior to the starting of construction, the project owner shall provide all the information required above to the SCFD/CalFire for review

and comment, to the CPM for review and approval, and to the DCBO for plan check approval and construction inspection.

WORKER SAFETY-8 The project owner shall either:

(1) reach an agreement with the Shasta County Fire Department regarding funding of its project-related share of capital costs to build a fire protection/response infrastructure as mitigation of project-related impacts on fire protection services, **or**, if no agreement can be reached shall

(2) fund its share of the capital costs in the amount of $1,000,000 and shall provide an annual payment of $340,000 to the SCFD (plus yearly negotiated increases) for the support of full-time fire department staff commencing with the date of site mobilization and continuing annually thereafter on the anniversary until the final date of project decommissioning.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall provide to the CPM for review and approval either:

(1) A copy of the agreement with the SCFD or

(2) Documentation that a letter of credit in the amount of $1,000,000 has been provided to the SCFD and that a letter of credit in the amount of $340,000 will be provided each year (plus yearly negotiated increases) at the start of commercial operations.

4.4.6 References

CEC 2024g – California Energy Commission (TN 254837). ROC with Shasta County Fire Chief, dated March 5, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2024o – California Energy Commission (TN 258001). ROC – Email Response to Staff's Informal Request of February 7, 2024, dated July 25, 2025. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2024p – California Energy Commission (TN 258069). ROC – Informal Data Requests/Questions, dated July 26, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Cooley, Sonia 2024. Deputy Fire Marshal, Riverside County Fire Department. Personal communication March 11

Shasta County Fire Department 2023 https://www.shastacounty.gov/fire/page/fire-stations-battalions, accessed 12-5-23

Smith, N. and de Vries, E. 2004. *"Wind and Fire: Reducing the Risk of Fire Damage in Wind Turbines,"* Submission 99 - Attachment 2 Published in Renewable Energy

World September–October 2004:https://www.issuu.com/bryansimpson/docs/windandfirearticle

Stantec 2024p (TN 254794). FWP Description Update, dated March 4, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Uadiale, S. et al 2014. “Overview of Problems and Solutions in Fire Protection Engineering of Wind Turbines.” Fire Safety Science - Proceedings of the Eleventh International Symposium, pp. 983-995

You, F. et al 2023. “Fire risk assessments and fire protection measures for wind turbines: A review.” Heliyon 9 (2023) e19664

Section 5

Environmental Impact Assessment

Under the California Environmental Quality Act (CEQA), the environmental setting of a project is generally the physical environmental conditions in the vicinity of the project as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced (CEQA Guidelines, § 15125(a)(1)). The environmental setting described in an EIR by the lead agency will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant (CEQA Guidelines, § 15125(a)).

5.1 Air Quality

The Air Quality section describes the environmental setting and regulatory background and discusses impacts specific to ambient air quality associated with the construction, operation and maintenance, and eventual decommissioning of the proposed project.

The air quality analysis focuses on criteria air pollutants, for which there are established ambient air quality standards for public health protection. Toxic air contaminants are addressed separately in the Public Health section.

5.1.1 Environmental Setting

Existing Conditions

Criteria Air Pollutants

The U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards (AAQS) for several pollutants based on their adverse health effects. The U.S. EPA has set national ambient air quality standards (NAAQS) for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter of 10 micrometers or less in diameter (PM10), particulate matter of 2.5 micrometers and smaller in diameter (PM2.5), sulfur dioxide (SO_2), and lead (Pb). Primary standards were set to protect public health; secondary standards were set to protect public welfare against visibility impairment, damage to animals, crops, vegetation, and buildings. Sources of nitrogen oxides (NOx) and volatile organic compounds (VOC) or reactive organic gases (ROG) are also regulated as these pollutants are precursors to ozone formation through photochemical reactions in the ambient air. In addition, CARB has established California ambient air quality standards (CAAQS) for these pollutants, as well as for sulfates (SO_4^{2-}), visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride. California AAQS (CAAQS) are generally stricter than NAAQS.

The ambient air quality standards currently in effect in California and nationally are shown in **Table 5.1-1**.

TABLE 5.1-1 NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards (Primary)	National Standards (Secondary)
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	—	Same as Primary Standard
	8 hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	
PM10	24 hour	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Mean	20 µg/m^3	—	
PM2.5	24 hour	—	35 µg/m^3	Same as Primary Standard

TABLE 5.1-1 NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards (Primary)	National Standards (Secondary)
	Annual Mean	12 µg/m^3	12 µg/m^3 9 µg/m^3 (2024)	15 µg/m^3
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8 hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3) c	—
	Annual Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	—
	3 hour	—	—	0.5 ppm (1,300 µg/m^3)
	24 hour	0.04 ppm (105 µg/m^3)	0.14 ppm	

Notes: ppm=parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; "—" = no standard.
Note: On March 6, 2024 (89 FR 16202), the U.S. EPA published a final rule to strengthen the primary annual PM2.5 NAAQS from 12.0 µg/m^3 to 9.0 µg/m^3; during 2024 and 2025, the State of California will develop recommendations for attainment and nonattainment designations for review by U.S. EPA.
Sources: CARB 2016.

The air quality standards, shown in **Table 5.1-1**, are designed and established to be health protective. Air pollution can cause known health problems, especially for children, the elderly, and people with heart or lung problems. Healthy adults may experience symptoms during periods of intense exercise. Pollutants can also cause damage to vegetation, animals, and property. This analysis relies on the ambient air quality standards as health-based thresholds to help define what is considered a substantial pollutant concentration for the criteria air pollutants.

Attainment Status

The project site is in Shasta County in the northern end of the Sacramento Valley Air Basin (Air Basin), which is comprised of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, and Yuba counties, and portions of Placer County and Solano County (CARB 2022).

Shasta County is classified as a nonattainment area (transitional) for the State 1-hour and 8-hour ozone standards (AQMD 2021). For all other criteria pollutants, Shasta County is classified as either unclassified or as attainment with respect to State and federal ambient air quality standards (FWPA TN 248288-5; Shasta County DEIR).

The criteria air pollutants of greatest concern are ozone and PM10. The remainder of the Air Basin, south of Shasta County includes the Sacramento Federal Nonattainment Area that exceeds the 8-hour ozone NAAQS of 0.070 ppm (AQMD 2021), and portions

of the Air Basin south of Shasta County are classified as nonattainment of the State PM10 standards (CARB 2022).

Existing Ambient Air Quality

The nearest background ambient air quality monitoring stations to the project site are in Shasta Lake for ozone and Redding for PM10 and PM2.5. The Shasta Lake monitoring station is located approximately 27 miles west-southwest of the southwestern project site boundary, and the Redding monitoring station is located approximately 30 miles southwest of the southern project site boundary (FWPA TN 248288-5; Shasta County DEIR). Other criteria pollutants, including NO_2, CO, and SO_2, are not monitored by CARB in the project area, and localized concentrations are anticipated to be well within the most-stringent standards.

Table 5.1-2 presents the air quality monitoring data from the two monitoring stations from 2020 to 2022, the most recent years for which data are available. Data in this table that are marked in bold indicate that the most-stringent current standard was exceeded during that period.

TABLE 5.1-2 AMBIENT AIR QUALITY MONITORING DATA

Pollutant	Averaging Time	2020	2021	2022
O_3 (ppm)	1-hour	0.088	0.079	0.078
	8-hour	**0.078**	**0.073**	**0.071**
PM10 (µg/m^3)	24-hour	**94.4**	**121.6**	**51.4**
	Annual	**23**	19	19
PM2.5 (µg/m^3)	24-hour (98th percentile)	**65.6**	**105.8**	22.1
	Annual	**10.1**	**11.7**	5.8

Notes: Ozone data from Shasta Lake; PM10 and PM2.5 data from Redding monitoring station.
Concentrations in **bold** type are those that exceed the limiting ambient air quality standard.
Sources: CARB 2024a.

The maximum ozone, PM10, and PM2.5 concentration values listed in **Table 5.1-2** have not been screened to remove values that may be designated by U.S. EPA as exceptional events. Violations that are the result of exceptional events, such as wildfires, are normally excluded from consideration as AAQS violations. Exceptional events undoubtedly affected many of the maximum concentration values in recent years, especially with wildfires generally occurring between September to November.

Health Effects of Criteria Pollutants

Below are descriptions of the health effects of criteria pollutants that are a concern in the regional study area. The California Health and Safety Code Section 39606 requires CARB to adopt ambient air quality standards at levels that adequately protect the health of the public, including infants and children, with an adequate margin of safety. Ambient air quality standards define clean air (CARB 2024b).

Ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other

materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and NOx, including NO_2. Significant ozone production generally requires ozone precursors (ROG and NOx) to be present in a stable atmosphere with strong sunlight.

Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli, potentially leading to wheezing and shortness of breath. Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases such as asthma, emphysema, and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when the symptoms have disappeared; and cause chronic obstructive pulmonary disease. Long-term exposure to ozone is linked to aggravation of asthma and may be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children. The inhalation of ozone causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms, and exposure to ozone can reduce the volume of air that the lungs breathe in and cause shortness of breath.

People most at risk for adverse health effects from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engaged in vigorous activities compared to adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures.

Particulate Matter. PM10 and PM2.5 represent size fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health. The health effects of particulate matter may include cardiovascular effects, such as cardiac arrhythmias and heart attacks, and respiratory effects, such as asthma attacks and bronchitis. Particulates can also reduce visibility.

Nitrogen Dioxide. Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods (as represented by the 1-hour standards) can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms. Longer exposures to elevated

concentrations of NO_2 (as represented by the annual standards) may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO_2. Emissions of NOx, which includes NO_2 and NO, react with other chemicals in the air and sunlight to form both particulate matter and ozone.

Carbon Monoxide. CO is a pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Sulfur Dioxide. SO_2 is produced through the combustion of sulfur or sulfur-containing fuels such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (PM10 and PM2.5) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead. Lead has a range of adverse neurotoxin health effects and was predominately released into the atmosphere primarily via the combustion of leaded gasoline. The phase-out of leaded gasoline has resulted in decreasing levels of atmospheric lead.

Sensitive Receptors

The Shasta County AQMD, *Environmental Review Guidelines*, define sensitive receptors as: facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors (AQMD 2003a).

The closest sensitive receptors to the project site would be existing residences. The nearest residence to any of the work areas on the project site would be those along Sycamore Road, approximately 1,900 feet from a construction staging area. The closest residence to any of the access roads on the project site would be along Moose Avenue, at a distance of approximately 400 feet. (FWPA TN 248288-5; Shasta County DEIR).

Regulatory

The federal, state, and local laws and policies applicable to the control of criteria pollutant emissions and mitigation of air quality impacts appear in this section.

Federal

Federal Clean Air Act. The federal Clean Air Act (CAA) (42 U.S.C., § 7401 et seq.) establishes the statutory framework for regulation of air quality in the United States. Under the CAA, the U.S. EPA oversees the implementation of federal programs for permitting new and modified stationary sources, controlling toxic air contaminants, and reducing emissions from motor vehicles and other mobile sources.

Title I (Air Pollution Prevention and Control) of CAA requires establishment of NAAQS, air quality designations, and plan requirements for nonattainment areas. States are required to submit a State Implementation Plan (SIP) to the U.S. EPA for areas in nonattainment with NAAQS. The SIP must demonstrate how state and local regulatory agencies will institute rules, regulations, and other programs to attain NAAQS. Once approved by the U.S. EPA and published in the Federal Register, the local air district rules contained in the SIP become federally enforceable. State law makes CARB the lead agency for all purposes related to the components that are included in the California SIP. For all local air districts in California, the SIP relies on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products (CARB 2024c).

Title 40 Code of Federal Regulations Subchapter C –Air Programs. Title 40 of the Code of Federal Regulations (CFR) Part 51, Requirements for Preparation, Adoption, and Submittal of Implementation Plans, establishes the requirements for Nonattainment New Source Review (NSR). The NSR program requires new and modified stationary sources to obtain air permits and requires Best Available Control Technology (BACT) and emissions offsets.

40 CFR Part 52, Approval and Promulgation of Implementation Plans, including 40 CFR Part 52.21, Prevention of Significant Deterioration (PSD) of air quality, requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The purpose of the federal PSD program is to ensure that attainment areas remain in attainment of NAAQS based upon a proposed facility's annual emissions. The proposed project would be a new source that does not have a rule listed emission source thus the PSD trigger levels are 250 tons per year for NOx, VOC, SO2, PM2.5 and CO. Because proposed project emissions would be less than prescribed amounts, the project would not be subject to PSD.

Title 40 Code of Federal Regulations Part 60 Standards of Performance for New Stationary Sources

The New Source Performance Standards (NSPS) Program. The NSPS rules include Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, which establishes emission standards for compression ignition internal combustion engines, including stationary diesel engines powering emergency generators and fire water pumps. Manufacturers of emergency stationary internal combustion engines (ICE) using diesel fuel must certify that new engines comply with these emission standards (40 C.F.R., § 60.4205). Under NSPS Subpart IIII,

owners and operators of diesel-powered emergency engines must limit operation to a maximum of 100 hours per year for maintenance and testing.

Spark ignition engines, including stationary engines fired on natural gas, landfill gas, gasoline, or propane, are subject to NSPS Subpart JJJJ, known as the ICE NSPS (40 C.F.R., § 60.4230, et al.). This rule includes emission standards applicable to manufacturers of spark ignition engines; owners of certified engines must maintain the engine and control device according to the manufacturer's emission-related written instructions and keep records of conducted maintenance to demonstrate compliance (40 C.F.R., § 60.4243). Emergency engines may be used primarily to provide power when the normal power source is interrupted. Operation of an emergency engine in non-emergency situations is limited to 100 hours for certain purposes, such as readiness testing and engine maintenance.

State

Generally, state law designates local air districts as having primary responsibility for the control of air pollution from all sources other than mobile sources while the control of vehicular air sources is the responsibility of CARB. (Health and Saf. Code, §39002) CARB is also responsible for the state's overall air quality management, including, among other things, establishing CAAQS for criteria pollutants, identifying toxic air contaminants of statewide concern, and adopting measures to reduce the emissions of those toxics through airborne toxic control measures (ATCM), and regulating emissions of greenhouse gas emissions.

Section 40910 of the California Health and Safety Code. California Health and Safety Code (HSC) Section 40910-40930 requires air district permitting of stationary sources to be consistent with CARB approved Clean Air Plans.

Section 41700 of the California Health and Safety Code. This section states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

California Code of Regulations. California Code of Regulations (CCR) Section 93115. Airborne Toxics Control Measure (ATCM) for Stationary Compression Ignition Engines. Limits the types of fuels allowed, established maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines, including diesel-powered emergency generator and fire water pump engines.

U.S. EPA/CARB Off-Road Mobile Sources Emission Reduction Program. The California Clean Air Act mandates that CARB achieve the maximum degree of emission reductions from all off-road mobile sources to attain the state ambient air quality standards. Off-road mobile sources include construction equipment. The earliest (Tier

1) standards for large compression-ignition engines used in off-road mobile sources became effective in California in 1996. Since then, the Tier 3 standards for large compression-ignition engines used in off-road mobile sources went into effect in California for most engine classes in 2006, and Tier 4 or Tier 4 Interim (4i) standards apply to all off-road diesel engines model year 2012 or newer. The tiered engine exhaust standards and standards for fleets that are already in-use provide comprehensive regulation and control to reduce NOx and toxic diesel particulate matter (DPM) emissions from equipment throughout the State.

CARB In-Use Off-Road Diesel Fueled Fleets Regulation. The regulations for in-use off-road diesel equipment are designed to reduce NOx and DPM. Depending on the size of the fleet of equipment, the owner would need to ensure that the average emissions performance of the fleet meets certain state-wide standards (13 California Code of Regulations, Chapter 10, Section 2449.1). In lieu of improving the emissions performance of the fleet, electric systems can be installed to replace diesel equipment in the fleet average calculations. Presently, all equipment owners are subject to a five-minute idling restriction in the rule (13 California Code of Regulations, Chapter 10, Section 2449).

CARB Portable Equipment Registration Program (PERP). This program allows owners or operators of portable engines and associated equipment commonly used for construction or farming to register their units under a statewide portable program. This program allows them to operate their equipment throughout California without having to obtain individual permits from local air districts.

Regional

Northern Sacramento Valley Planning Area 2018 Triennial Air Quality Attainment Plan. The air districts for the counties of Shasta, Tehama, Butte, Glenn, Colusa, Sutter, and Yuba have established the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA air districts were designated as nonattainment for the ozone CAAQS and have jointly prepared an air quality attainment plan to attain the ozone CAAQS standard by the earliest practicable date. The NSVPA air districts jointly prepared the original 1991 Air Quality Attainment Plan and triennial updates to the plan, with the latest update being the 2021 Triennial Air Quality Attainment Plan (2021 Attainment Plan). The 2021 Attainment Plan includes an assessment of progress made in implementing control measure commitments of previous plans and identifies modifications to the strategies necessary to attain the ozone CAAQS by the earliest practicable date (AQMD 2021).

The 2021 Attainment Plan relies on ozone monitoring data from 2018 through 2020, which shows a slight increase in the number of exceedances of the 1-hour ozone CAAQS. Wildfires are a major contributor to these exceedances and the data shows a downward trend in the number of exceedances of 8-hour ozone CAAQS. Mobile sources comprise the majority of the NOx emission inventory in 2020, an estimated 68 percent of the total. Area-wide sources account for 42 percent of the ROG inventory in 2020.

The projected emissions show a downtrend for both ROG and NOx, which are the precursor emissions for ozone (AQMD 2021). To facilitate reductions from mobile sources, the NSVPA air districts administer several grant programs to fund cleaner-than-required engines and equipment, such as agricultural engine replacements and school bus replacements.

Local

Shasta County General Plan. The Air Quality Element of the Shasta County General Plan includes the following policies designed to reduce air pollutant emissions in the County (Shasta County 2004):

- Policy AQ-1e: The County shall require new air pollution point sources such as, but not limited to, industrial, manufacturing, and processing facilities to be located an adequate distance from residential areas and other sensitive receptors.
- Policy AQ-2a: The County will cooperate with the AQMD, CARB, and the Regional Transportation Planning Agency in implementing programs designed to comply with provisions of Federal and State Clean Air Acts and the County's Air Quality Attainment Plan.
- Policy AQ-2b: The County will work to accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the unincorporated portions of Shasta County.
- Policy AQ-2c: Land use decisions, where feasible, should contribute to the improvement of air quality. New projects shall be required to reduce their respective air quality impacts to below levels of significance, or proceed as indicated in Policy AQ-2e.
- Policy AQ-2d: Shasta County shall ensure that air quality impacts identified during CEQA review are: (1) consistently and fairly mitigated, and (2) mitigation measures are feasible.
- Policy AQ-2e: Shasta County will cooperate with the AQMD in assuring that new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year shall provide appropriate emission offsets. A comparable program which offsets indirect emissions of these pollutants exceeding 25 tons per year from development projects shall also be utilized to mitigate air pollution impacts. An Environmental Impact Report will be required for all projects that have unmitigated emissions of non-attainment pollutants exceeding 25 tons per year.
- Policy AQ-2f: Shasta County shall require appropriate Standard Mitigation Measures and Best Available Mitigation Measures on all discretionary land use applications as recommended by the AQMD in order to mitigate both direct and indirect emissions of non- attainment pollutants.

- Policy AQ-2g: Significance thresholds as proposed by the AQMD for emissions shall be utilized when appropriate for: (1) ROG and NOx, both of which are precursors of ozone, and (2) PM10 in determining mitigation of air quality impacts.
- Policy AQ-2h: Shasta County shall evaluate AQMD data annually to determine if the air quality impacts of development projects that may be insignificant by themselves are cumulatively significant.
- Policy AQ-2i: The County, in cooperation with the Cities of Redding, Anderson, and Shasta Lake and the AQMD, should develop an air quality impact analysis program to annually monitor and report the cumulative emissions from all new discretionary permits. This process will aid decision-makers in implementing effective and equitable mitigation measures.
- Policy AQ-2j: The County shall work toward measures to reduce particulate emissions from construction, grading, excavation, and demolition to the maximum extent feasible.
- Policy AQ-4b: The County's development standards shall require the paving of roads as a part of new development permits to the extent necessary to meet access and air quality objectives. These requirements shall be designed to help mitigate potentially significant adverse air quality impacts created by particulate emissions on both an individual and cumulative basis.

Shasta County AQMD Rules and Regulations. The following Shasta County AQMD rules may be applicable to the project to limit the generation of air pollutants in Shasta County. Where applicable these rules will be enforced through the CEC's certification:

- Rule 2:1, New Source Review and Rule 2:1A: Permits Required. These rules specify the requirements for new or modified sources air pollutants, portable or stationary, to first obtain from the AQMD an Authority to Construct (ATC) and Permit to Operate (PTO). Rule 2:1A includes provisions requiring property owners to obtain a "Road Emissions Permit" for any new land use activity that may or will result in an increase in dust emissions from any unpaved road serving the owner's property; enforcement of this provision may be stayed in unincorporated areas of the County where the Board of Supervisors has adopted and is enforcing an equivalent regulatory program for areas served by unpaved roads.
- Rule 2:5, Exemptions. This rule allows the Air Pollution Control Officer (APCO) to make exemptions of internal combustion engines, space heating and food preparation equipment, and heaters using natural gas and/or liquified petroleum gas, including propane.
- Rule 3:2, Specific Air Contaminants. This rule establishes limits to the amount of pollutants that may be discharged into the atmosphere.
- Rule 3:16, Fugitive, Indirect, or Non-Traditional Sources. This rule established conditions upon any source, including sources of construction-related fugitive dust, to mitigate the emissions from such sources to below a level of significance or to a

point that such emissions no longer constitute a violation of the California Health & Safety Code Section 41700 and/or Section 41701.

- Rule 3:17, Organic Solvent Cleaning and Degreasing Operations. This rule applies to parts cleaning and degreasing that uses solvents and requires cleaners to be equipped with covers and other features to reduce solvent evaporation. This rule also requires retaining records to track the waste solvent removal and volume of make-up solvent used for cleaners.
- Rule 3:28, Stationary Internal Combustion Engines. The provisions of this rule apply to any gaseous, diesel, or any other liquid-fueled stationary internal combustion engine within the boundaries of the AQMD. The emissions limits identified by this rule apply to any stationary internal combustion engine, excluding emergency equipment. Although emergency equipment are excluded from the emission limitations of the rule, all testing and maintenance of emergency standby engines shall be limited to no more than 100 hours per year, and administrative recordkeeping and permitting requirements apply.
- Rule 3:31, Architectural Coatings. This rule limits the quantity of VOCs in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within Shasta County.
- Rule 3:32, Adhesives and Sealants. This rule limits the emission of VOCs from adhesives and sealants and associated primers, and from related surface preparation solvents and cleanup solvents.

Cumulative

The proposed project would be in Shasta County, which is classified as a nonattainment area (transitional) for the State 1-hour and 8-hour ozone standards (AQMD 2021). The criteria air pollutants of greatest concern are ozone and PM10. The nonattainment status of the region and the Sacramento Valley Air Basin can be attributed to the region's development history and the influence of wildfire activity. Past, present, and future development projects contribute to the region's adverse air quality conditions on a cumulative basis.

The Cumulative Project Scenario and a list of cumulative projects appears in **Appendix 1, Table 1-2**. Past, present, and reasonably foreseeable probable future air pollutant emissions could be attributable to each of the cumulative projects, especially those that involve construction activities or O&M activities with substantial sources of air pollutants. Each of the projects in the cumulative project scenario could result in some level of contribution to the region's adverse air quality conditions, although the individual contribution of each project would be minimized if the project is consistent with air quality management planning efforts and in compliance with applicable local air district rules and regulations, as described with the regulatory setting (**Section 5.1.1.2**).

5.1.2 Environmental Impacts

AIR QUALITY Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐
b. 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?	☐	☒	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, Air Quality

5.1.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

The applicant estimated air pollutant emissions for construction activities and operation using CalEEMod (version 2020.4) and spreadsheet tools. Construction emissions quantification begins with considering the anticipated fleet of construction equipment (off-road), vendor and hauling truck trips, and worker vehicle trips, with helicopters separately itemized. The fleets and activity forecasts are based on the proposed project including up to 48 wind turbines, developed over 24 to 28 months of concurrent activities (FWPA TN 254794; Project Description, March 4, 2024). Quantification of daily maximum emissions reflects the applicant's understanding of the sequence of activities (FWPA TN 254767).

For this analysis, staff translated the applicant's off-road fleets and activity forecasts for construction and operation into an updated version of CalEEMod (version 2022.1.1). Using the newer version of CalEEMod ensures use of the most up-to-date emissions factors from statewide databases. Staff also reviewed the proposed project Traffic Study (FWPA TN 254771; Fountain Wind Traffic Study, March 1, 2024) to verify that the emissions estimates for on-highway vehicle activity fully capture the total numbers of construction worker, vendor and hauling truck trips, including equipment and materials

deliveries. When compared with the applicant's emissions estimates (FWPA TN 254767), staff increased the on-highway vehicle activity to be consistent with the anticipated totals of vehicle-miles traveled from the March 2024 Traffic Study (FWPA TN 254771). Emissions from helicopters and use of proposed concrete batch plants during construction are unchanged from the applicant's analysis (FWPA TN 254767).

Staff also uses the updated version of CalEEMod for operation-phase results for mobile sources, the emergency generator as a stationary source, and other uses of transportation fuels and energy (natural gas) to provide landscaping and space heating for the operation and maintenance (O&M) building.

Thresholds of Significance

Shasta County AQMD provides guidance to CEQA lead agencies through the 2003 *Protocol for Review, Land Use Permitting Activities* (AQMD 2003b). The AQMD recommends using two levels of emission thresholds to determine the appropriate level of required best available mitigation measures. If a project causes emissions greater than the Level A thresholds but less than Level B thresholds, appropriate mitigation should be implemented and the impact would be less than significant. If emissions exceed the Level B thresholds after the application of mitigation measures, then the project would be considered to have a significant air quality impact (AQMD 2003b). The AQMD recommendations appear in **Table 5.1-3**.

TABLE 5.1-3 CRITERIA POLLUTANT EMISSIONS THRESHOLDS OF SIGNIFICANCE

AQMD Recommendation	ROG (lb/day)	NOx (lb/day)	PM10 (lb/day)
Level A Thresholds	25	25	80
Level B Thresholds	137	137	137

Source: (AQMD 2003b).

Significance criteria also include Significant Impact Levels (SILs) for the particulate matter portions of the analysis. Regulatory agencies have traditionally applied SILs as a *de minimis* value, which represents the off-site concentration predicted to result from a source's emissions that does not warrant additional analysis or mitigation. If a source's modeled impacts at any off-site location do not exceed relevant SILs, the source owner would typically not need to assess multi-source or cumulative air quality modeling to determine whether or not that source's emissions would cause or contribute to a violation of the relevant NAAQS or CAAQS. In the project area, data in **Table 5.1-2** shows that the background levels of PM10 and PM2.5 exceed the most-stringent standards in the baseline conditions. Staff compares the project's contribution to local criteria pollutant concentrations to SILs to determine whether the project's emissions would contribute significantly to those exceedances.

To determine if the project could contribute substantially to the existing PM10 exceedances, this analysis relies on the U.S. EPA regulations defining PM10 SILs for federal nonattainment areas (40 CFR 51.165(b)(2)) for 24-hour impacts (5 µg/m^3) and for annual impacts (1 µg/m^3). The same U.S. EPA regulation (40 CFR 51.165(b)(2)) also

establishes a PM2.5 SIL value for 24-hour impacts (1.2 µg/m^3), and prior to the effective date of the 2024 annual PM2.5 NAAQS, the U.S. EPA issued a recommendation to set the PM2.5 SIL value for annual impacts at 0.13 µg/m^3 (April 30, 2024).

5.1.2.2 Direct and Indirect Impacts

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

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

This section considers the project's consistency with the applicable air quality management plan. This is a qualitative determination that considers the combined effects of project construction and operation.

Construction and Operation

Less Than Significant Impact with Mitigation Incorporated. The California SIP and NSVPA 2021 Attainment Plan are applicable air quality management plans for all emitting activities in Shasta County, including the proposed project.

The AQMD has the responsibility to develop the applicable air quality management plans and regulations to achieve the air quality standards consistent with the plans. Additionally, the AQMD has the authority to adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards, as necessary to implement the air quality management plans (AQMD 2003b). The Air Quality Element of the Shasta County General Plan describes how local agency review can be coordinated with the AQMD to ensure that local actions conflict with or obstruct implementation.

To determine if a project would conflict with or obstruct implementation of the applicable air quality plan, lead agencies must demonstrate that a given project would not directly obstruct implementation of an applicable air quality plan and that the project would be consistent with the assumptions upon which the air quality plan is based (FWPA TN 248288-5; Shasta County DEIR). Each air quality management plan includes emission inventory, population, and employment growth forecasts that are relied upon for projecting how attainment is achieved.

Construction of the proposed project would result in an increase in short-term employment compared to existing conditions. Construction and decommissioning activities and the associated jobs would not conflict with the long-term employment projections because the construction workforce for the project would be temporary in nature. Construction activities would be conditioned to include appropriate and best available emissions control measures, consistent with Shasta County General policies for minimizing ozone precursors and particulate matter emissions.

Long-term operation of the proposed project, including up to 10 full-time employees, would not conflict with employment projections. The operation and maintenance activities would result in limited quantities of ozone precursor and particulate matter emissions; the project emissions from worker automobile trips, maintenance with cranes, and emergency generator testing would occur at levels that would not obstruct implementation of the air quality management plans. New sources of emissions would be conditioned to comply with AQMD air permitting requirements, including operating limitations and applicable emission standards that form the basis of attainment planning.

All construction and operation activities would occur in compliance with applicable federal, state, and local requirements, including those that are relied upon for attainment planning. The employment associated with the project would be consistent with the planning forecasts. Compliance with air permitting requirements, and other applicable requirements, ensures that proposed project emissions are included within the emission inventory forecasts that are relied upon for attainment planning.

For these reasons, the project would be consistent with the California SIP and NSVPA 2021 Attainment Plan. The project with mitigation would have a less than significant impact related to implementation of the applicable air quality management plans.

b. 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?

This section quantifies the project's criteria pollutant emissions rates and focuses on whether project-related emissions of nonattainment criteria pollutants would exceed any of the applicable local air district significance thresholds.

Construction

Less Than Significant with Mitigation Incorporated. Project construction would cause emissions from the exhaust of the engines of construction equipment and the vehicles carrying construction materials and workers to and from the site and fugitive dust from travel on paved and unpaved surfaces, grading, installing underground utilities, and material handling. Construction would also involve portable equipment, such as concrete batch plants. Emissions similar to those of construction would occur after the useful life of the project concludes, with eventual decommissioning. Closure and decommissioning, as a one-time limited duration event, would have emissions that are similar in type and magnitude but likely at lower rates than construction.

Construction and eventual decommissioning activities would generate exhaust emissions from the engines of construction equipment and the vehicles carrying construction materials and workers to and from the site. Construction would span a two-year period, involving mobilizing the heavy-duty construction equipment, site development and preparation, access road construction, and installation of all

components of the wind turbine generators, substation, and underground collector system. The range of mobile sources includes the fleet of off-road equipment, on-road vehicles such as haul trucks, and worker personal vehicles and pickup trucks used to transport workers around the construction site, and helicopters. These mobile sources would emit from within the site boundaries and off-site along transportation routes accessing the site. The applicant anticipates helicopter use would occur during both the overhead collection system and transmission line connection phase (FWPA TN 254767).

Emissions estimates reflect the maximum daily rates of emissions during overlapping activities. For example, certain support equipment would be used for deliveries nearly continuously (FWPA TN 250274; Construction Assumption, May 23, 2023). Where phases overlap in time, the daily rates of emissions are added together. The emissions results reflect the applicant's predictions of different phases overlapping in time (FWPA TN 254767), as described here.

Construction Year 1 Overlapping Phases:

- Timber Removal and Grubbing overlaps with
- Grading and Access Road Work; and
- Concrete Batch Plants overlaps with
- Foundations.

Construction Year 2 Overlapping Phases:

- Turbine and Transformer Installation overlaps with
- Substation and O&M Building Installation, and with
- Underground Collector System; and
- Overhead Collection Systems partially overlaps with Substation Installation.

The "Transmission Line Connection" phase would also contribute to emissions in the second year, as associated with the PG&E Interconnection Infrastructure, although the applicant expects these activities to occur after the overall peak in activity at the site. Accordingly, emissions during installation of the transmission line connection would not contribute to the maximum daily rates of construction emissions although these emissions would be included in the overall total construction emissions.

Table 5.1-4 summarizes the maximum daily emissions rates anticipated during the two years of construction activities. The daily emissions include all mobile sources, including emissions from within the site boundaries and those that occur along off-site transportation routes for supplies that would be sourced locally and outside of Shasta County, consistent with the applicant's Traffic Study (FWPA TN 254771).

TABLE 5.1-4 MAXIMUM DAILY EMISSIONS, CONSTRUCTION WITHOUT MITIGATION

Construction Activity	ROG (lb/day)	NOx (lb/day)	CO (lb/day)	PM10 Exhaust (lb/day)	PM10 Total (lb/day)	PM2.5 Total (lb/day)
Construction, Year 1	24.5	245.0	205.0	9.2	9,225.0	951.0
Concrete Batch Plant, Year 1 (fugitive dust)	---	---	---	---	4.1	2.8
Construction, Year 2	24.0	275.0	234.0	10.2	6,210.0	632.0
Helicopters, Year 2	5.2	7.8	6.5	0.2	4.4	0.6
Year 1 Maximum Daily, Unmitigated	**24.5**	**245.0**	**205.0**	**9.2**	**9,229**	**954**
Year 2 Maximum Daily, Unmitigated	**29.2**	**282.8**	**240.5**	**10.4**	**6,214**	**633**
AQMD Thresholds of Significance	137	137	N/A	N/A	137	137
Threshold Exceeded?	No	Yes	---	---	Yes	Yes

Source: Activity estimates for off-road equipment and emissions estimates for Concrete Batch Plant and Helicopters from applicant (FWPA TN 254767). Staff emissions estimates for updated on-road vehicle activity from Traffic Study (FWPA TN 254771) using CalEEMod (version 2022.1.1).
Note: Staff uses the AQMD emissions threshold for PM10 as indicative of a potential PM2.5 impact.
Note: Results include portions of on-road emissions occurring beyond the Shasta County AQMD territory.

Table 5.1-4 shows that, without mitigation, project emissions of NOx, PM10 and PM2.5 during construction would exceed the thresholds of significance. The applicant recognized the potential for significant levels of emissions during construction and proposes to implement fugitive dust control during construction, including application of appropriate dust suppressants, as necessary, such as water or surfactants approved for use in the State of California (FWPA TN 254794).

To reduce these emissions, staff identifies proposed Conditions of Certification **AQ-SC1** to **AQ-SC5** to sufficiently reduce NOx and PM2.5 from equipment and to also substantially reduce PM10, including fugitive dust. Staff's proposed mitigation measures effective and comprehensive "best practices" for avoiding air quality impacts during construction.

Staff recommends Condition of Certification **AQ-SC1** to require an on-site construction mitigation manager who would be responsible for the implementation and compliance of the overall construction mitigation program. The documentation of the ongoing implementation and compliance with the construction mitigation program would be provided in the monthly compliance report that is required in staff's recommended Condition of Certification **AQ-SC2**.

Recommended Condition of Certification **AQ-SC3** formalizes the construction fugitive dust control requirements. These requirements include paving or stabilizing with soil binders the main access roads through the facility and delivery areas before construction begins on that part of the site. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied

to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction.

Recommended Condition of Certification **AQ-SC4** would monitor activities for potential visible dust emissions and require responding to situations when the control measures required by **AQ-SC3** are not working effectively to limit the transport of fugitive dust plumes from construction areas.

Staff recommends Condition of Certification **AQ-SC5** to mitigate diesel engine emissions of NOx and particulate matter (PM10 and PM2.5) by mandating use of diesel-fueled construction equipment that complies with Tier 4 Final emission standards for off-road engines. Implementation of this mitigation measure would provide important NOx mitigation and would reduce diesel particulate matter, which is a designated toxic air contaminant.

Table 5.1-5 summarizes the mitigated maximum daily rates of construction emissions with **AQ-SC1** to **AQ-SC5**. The proposed Conditions of Certification are based on staff's recommendations in prior renewable energy projects, and the conditions would be as stringent as the applicant's proposed mitigation measures and prior mitigation identified by Shasta County (FWPA TN 248288-5; Shasta County DEIR).

TABLE 5.1-5 MAXIMUM DAILY EMISSIONS, CONSTRUCTION WITH MITIGATION

Construction Activity	ROG (lb/day)	NOx (lb/day)	CO (lb/day)	PM10 Exhaust (lb/day)	PM10 Total (lb/day)	PM2.5 Total (lb/day)
Construction, Year 1	7.4	114.0	300.0	2.4	8,197.0	830.0
Concrete Batch Plant, Year 1 (fugitive dust)	---	---	---	---	4.1	2.8
Construction, Year 2	7.2	119.0	299.0	2.6	5,254.0	531.0
Helicopters, Year 2	5.2	7.8	6.5	0.2	4.4	0.6
Year 1 Maximum Daily, Mitigated	**7.4**	**114.0**	**300.0**	**2.4**	**8,201**	**833**
Year 2 Maximum Daily, Mitigated	**12.4**	**126.8**	**305.5**	**2.8**	**5,258**	**532**
AQMD Thresholds of Significance	137	137	N/A	N/A	137	137
Threshold Exceeded?	No	No	---	---	Yes	Yes

Source: Activity estimates for off-road equipment and emissions estimates for Concrete Batch Plant and Helicopters from applicant (FWPA TN 254767). Staff emissions estimates for updated on-road vehicle activity from Traffic Study (FWPA TN 254771) using CalEEMod (version 2022.1.1).
Note: Staff uses the AQMD emissions threshold for PM10 as indicative of a potential PM2.5 impact.
Note: Results include portions of on-road emissions occurring beyond the Shasta County AQMD territory.

Table 5.1-5 shows that with mitigation PM10 and PM2.5 construction emissions would continue to exceed the threshold of significance during construction. The majority of PM10 and PM2.5 emissions would be caused by on-road vehicle activity, which occur off-site and along the regional roadway network. All results presented here include the

portions of on-road emissions that would occur beyond the Shasta County AQMD territory.

All air quality impacts during construction would be considered short-term effects. Shasta County's guidelines for implementing CEQA recognize that construction activities can cause substantial increases in emissions that may lead to localized concentrations of particulate matter and may affect PM10 compliance with ambient air quality standards on a regional basis. To avoid this impact, the AQMD suggests using feasible control measures shown to be effective and comprehensive, and "effective and comprehensive" can be reasonably implemented to reduce PM10 emissions from construction to a level considered less-than-significant (AQMD 2003b).

This analysis presents staff's recommendations for "effective and comprehensive" PM10 and PM2.5 emissions controls through measures **AQ-SC1** to **AQ-SC5**, shown in **Section 5.1.5, Proposed Conditions of Certification**. These measures would be consistent with the County's guidelines (AQMD 2003b) for ensuring that the impact of construction PM10 and PM2.5 emissions would be reduced to a level of less-than-significant with mitigation. Additionally, the residual impacts of PM10 and PM2.5 concentrations are evaluated further under criterion "c" to quantify the effects of PM10 and PM2.5 construction emissions in relation to the ambient air quality standards. The analysis shows that the project's contributions to the concentrations of PM10 and PM2.5 at nearest sensitive receptor locations would be below the relevant SILs.

Operation

Less Than Significant Impact with Mitigation Incorporated. Operation emissions would result from off-site vehicle trips for worker commutes, material deliveries, site security, and facility upkeep plus emissions from occasional propane fuel combustion by the emergency generator; additionally, minor emissions would be caused by routine use of architectural coatings, consumer product use, and landscaping at the O&M building.

Table 5.1-6 shows daily emissions rates and **Table 5.1-7** shows annual emissions rates for the different project effects of the O&M activities, including the use of vehicles, the emergency generator, and other miscellaneous sources, separately discussed below.

TABLE 5.1-6 DAILY EMISSIONS DURING OPERATION

Emission Source	ROG (lb/day)	NOx (lb/day)	CO (lb/day)	PM10 Exhaust (lb/day)	PM10 Total (lb/day)	PM2.5 Total (lb/day)
O&M Vehicle Trips	0.33	0.86	5.61	0.01	130	13.1
Emergency Generator Testing	14.1	1.36	36.8	0.08	0.08	0.08
O&M Building Energy Use	< 0.005	0.08	0.06	0.01	0.01	0.01
O&M Cranes and Mowers	0.8	6.82	5.32	0.41	0.41	0.38

TABLE 5.1-6 DAILY EMISSIONS DURING OPERATION

Emission Source	ROG (lb/day)	NOx (lb/day)	CO (lb/day)	PM10 Exhaust (lb/day)	PM10 Total (lb/day)	PM2.5 Total (lb/day)
O&M Area Sources, Consumer Products, Landscaping	0.24	< 0.005	0.3	< 0.005	< 0.005	< 0.005
Total, Daily Emissions from Operation	**15.5**	**9.1**	**48.1**	**0.5**	**130.5**	**13.6**
Level A, AQMD Thresholds of Significance	25	25	N/A	N/A	80	80
Level A Threshold Exceeded?	No	No	---	---	Yes	No
Level B, AQMD Thresholds of Significance	137	137	N/A	N/A	137	137
Level B Threshold Exceeded?	No	No	---	---	No	No

Source: Activity estimates from applicant (FWPA TN 250273), updated for emergency generator use up to 15 hours per day. Staff emissions estimates using CalEEMod (version 2022.1.1).
Note: Staff uses the AQMD emissions threshold for PM10 as indicative of a potential PM2.5 impact.

TABLE 5.1-7 ANNUAL EMISSIONS DURING OPERATION

Emission Source	ROG (ton/yr)	NOx (ton/yr)	CO (ton/yr)	PM10 Exhaust (ton/yr)	PM10 Total (ton/yr)	PM2.5 Total (ton/yr)
O&M Vehicle Trips	0.06	0.15	0.81	< 0.005	18.4	1.86
Emergency Generator Testing	0.05	< 0.005	0.12	< 0.005	< 0.005	< 0.005
O&M Building Energy Use	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005
O&M Cranes and Mowers	0.10	0.89	0.69	0.05	0.05	0.05
O&M Area Sources, Consumer Products, Landscaping	0.04	< 0.005	0.03	< 0.005	< 0.005	< 0.005
Total, Annual Emissions from Operation	**0.25**	**1.05**	**1.66**	**0.05**	**18.45**	**1.91**

Source: Activity estimates from applicant (FWPA TN 250273). Staff emissions estimates using CalEEMod (version 2022.1.1).

Vehicle Trips and O&M Equipment. Proposed project operations with maintenance and inspection of the wind energy generation facility would require use of motor vehicles and off-road equipment including mobile cranes. For the vehicle trips and proposed project workforce of up to 10 full-time employees, emissions would involve a portion of travel on unpaved surfaces within the site. The applicant provided emissions estimates based on up to 24 trips daily (FWPA TN 250273), and the applicant's Traffic Study anticipates 60 miles of traveling for each O&M vehicle (FWPA TN 254771). Staff calculated the emissions from vehicle trips based on these assumptions and updated the results using the newer version of CalEEMod (version 2022.1.1).

Travel on Unpaved Access Roads. The proposed project would include up to 19 miles of new and 19 miles of widened access roads, that would generate fugitive dust,

as O&M activities would travel on these unpaved surfaces. Staff accounts for 88 percent of the O&M travel occurring on paved roads and the remainder being on unpaved access roads, to ensure that emissions account for travel to staging areas that would be an average of 6 miles from the highway (FWPA TN 250273).

To manage the regional impact of particulate matter from unpaved roads, AQMD Rule 2:1A requires that certain on-site access roads shall be paved, subject to exclusions. Shasta County has a policy of requiring paved roads for non-residential discretionary uses, except in "resource" designations (General Plan, Section 7.4, Circulation Element, Policy C-6e). Because the proposed project area is designated by the Shasta County General Plan as Timber (T), and zoned as Timber Production (TP), the land use designation of the site is a "resource" designation where the County's road paving policy would not apply (General Plan, Section 6.2, Timberlands Element).

Table 5.1-6 shows that total PM10 emissions from vehicle trips and travel on unpaved access roads would exceed the "Level A" threshold during project operation. These emissions would be subject to general standards for nuisance prevention. While O&M activities on the site would need to comply with AQMD Rule 3:16, which limits visible emissions from fugitive dust, Rule 3:16 provides an exemption for unpaved roads that are not part of a construction activity. Staff recommends mitigation for operation-phase dust control in Condition of Certification **AQ-SC6** to limit visible emissions and ensure compliance with California Health and Safety Code standards for nuisance prevention.

Stationary Sources – Propane Emergency Generator. The proposed project would include an emergency generator. The engine would be rated at 107 horsepower and would run on compressed natural gas or propane. The annual use of this engine is not expected to exceed 100 hours per year (FWPA TN 254693), and estimated maximum daily use would be less than 15 hours per day (AQMD 2024). The air permit application for the propane emergency generator was found by the AQMD to be "administratively complete" on August 14, 2023 (FWPA TN 251630; AQMD 2023), and the AQMD provided a permit evaluation for this source and recommendations for permit conditions (FWPA TN 254693; AQMD 2024). Staff recommends Conditions of Certification **AQ-SC7** and **AQ-SC9** to ensure compliance with applicable operating limitations and NSPS emissions standards and to incorporate all applicable stationary source permit conditions (**AQ-SC7** through **AQ-SC9**).

Miscellaneous Operational Emissions. Miscellaneous operational emissions would occur from use of the O&M building (7,000 square-feet), where energy would be consumed for O&M building heating and cooling needs and due to the periodic use of architectural coatings and landscaping, etc. Emissions from these miscellaneous activities are counted using estimates for the typical occupation and use of the O&M building, with defaults from CalEEMod (version 2022.1.1).

Table 5.1-6 shows that the project would exceed the Level A thresholds due to emergency generator testing and due to PM10 from vehicle trips. Staff's recommended mitigation for operation-phase dust control in **AQ-SC6** would reduce the impact of

PM10 from travel on unpaved access roads, and **AQ-SC7** through **AQ-SC9** would ensure that emergency generator testing occurs in compliance with applicable standards and limitations.

The project would not exceed the Level B thresholds of significance during the operation phase. The project's operations would not result in a cumulatively considerable net increase of any criteria pollutant, and therefore the impact of O&M criteria pollutants would be less than significant with mitigation.

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

This section describes the effect of proposed project emissions on the ambient air pollutant concentrations and identifies sensitive receptors potentially impacted by project construction and operations.

Staff considers any new AAQS exceedance or a substantial contribution to any existing AAQS exceedance caused by the project's emissions to be substantial evidence of potentially significant impacts that would require the evaluation of potential mitigation measures.

The pollutants of concern for this case are the nonattainment pollutants: ozone, PM10, and PM2.5. Because construction-phase ozone precursor and PM2.5 emissions, and all operation-phase emissions, would occur at rates below the AQMD significance thresholds, this section of the staff analysis focuses on the ambient air quality impacts of PM10 emissions during construction.

Construction

Less Than Significant Impact with Mitigation Incorporated. Construction emissions of criteria pollutants are shown, with mitigation in **Table 5.1-5** under criterion "b" of the CEQA environmental checklist. Emissions of pollutants other than PM10 and PM2.5 during project construction would not exceed significance thresholds, and thus are not likely to result in substantial pollutant concentrations for any receptor.

Because PM10 and PM2.5 emissions during construction would exceed the emissions thresholds, this section of the staff analysis explores the ambient air quality impacts of PM10 and PM2.5 during construction to evaluate whether substantial pollutant concentrations could occur. The AQMD recommends requiring implementation of effective and comprehensive control measures for minimizing construction PM10 impacts. The AQMD guidelines note that PM10 emitted during construction can vary greatly depending on the level of activity, the specific work or activity taking place, the equipment being operated, local soils, weather conditions, and other factors, making quantification difficult (AQMD 2003b). Consistent with AQMD recommendations for PM10 impacts, staff identifies a comprehensive mitigation strategy to control on-site PM10 and PM2.5 as described in the impact analysis under criterion "b," as shown in **Section 5.1.5, Proposed Conditions of Certification**.

The applicant provided a dispersion modeling analysis for construction-phase PM10 impacts and found that receptors at the property boundary would experience minimal (less than 0.02 µg/m^3) changes in 24-hour PM10 concentrations during construction (FWPA TN 251208; Air Quality Responses, July 27, 2023). Staff reviewed the applicant's dispersion modeling and determined that an independent staff analysis would be needed to reflect greater levels of on-site activity and to incorporate changes made to the proposed property boundary by the applicant after the applicant's original dispersion modeling.

Table 5.1-8 shows the results of dispersion modeling conducted by staff to reflect the emissions quantified in this impact analysis under criterion "b." The project impact column shows the worst-case impacts of the project from modeling. The background column shows the highest concentrations from the prior three years (2020-2022), from **Table 5.1-2**. The background PM10 and PM2.5 are shown in **bold** because these exceed the corresponding limiting standards. The total impact column shows the sum of the existing background condition plus the maximum modeled impact predicted by the modeling analysis for construction. The limiting standard column combines CAAQS or NAAQS, whichever is more stringent.

TABLE 5.1-8 AMBIENT PM10 AND PM2.5 CONCENTRATIONS DURING PROJECT CONSTRUCTION

Pollutant	Averaging Time	Project Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10 (µg/m^3)	24-hour	7.7	**121.6**	**128.8**	50	**258%**
	Annual	0.56	**23**	**23.6**	20	**118%**
PM2.5 (µg/m^3)	24-hour	0.79	**105.8**	**106.6**	35	**305%**
	Annual	0.11	**11.7**	**11.8**	9	**131%**

Notes: Concentrations in **bold** type are those that exceed the limiting ambient air quality standard.
Source: Independent staff analysis.

Table 5.1-8 shows that the existing PM10 and PM2.5 concentrations are above the limiting standards in the background conditions. The project would therefore contribute to existing exceedances of the PM10 and PM2.5 standards. Dispersion modeling shows that the individual project impact would be limited to locations along the property boundary where access roads or other project components are immediately adjacent to the boundary. The project's contributions to the concentrations of PM10 and PM2.5 at nearest sensitive receptor locations, which are setback somewhat from the property boundary would be below the relevant SILs.

The maximum modeled 24-hour PM10 concentrations during construction would exceed the U.S. EPA PM10 SIL of 5 µg/m^3 for 24-hour impacts, and the maximum modeled annual PM10 concentration would not exceed the SIL of 1 µg/m^3 for annual impacts. For PM2.5, the maximum modeled 24-hour PM2.5 impacts of would not exceed either the 24-hour PM2.5 SIL of 1.2 µg/m^3 or the annual PM2.5 SIL of 0.13 µg/m^3.

The results provided in **Table 5.1-8** are maximum impacts predicted to occur primarily due to fugitive dust along the southern and eastern project property boundaries where

areas of disturbance for access roads and underground collection system would be adjacent to the property boundary. The worst-case PM10 impacts would occur at or near the disturbed areas and decrease rapidly with distance. The closest residence to any of the proposed access roads would be along Moose Avenue where residences would be sufficiently separated from proposed project components to ensure that the maximum PM10 concentrations would not exceed the U.S. EPA PM10 SIL of 5 $\mu g/m^3$ for 24-hour impacts at any sensitive receptor locations.

Accordingly, for all sensitive receptor locations, mitigated levels of construction-phase PM10 and PM2.5 emissions would cause concentrations of PM10 and PM2.5 that would be below the relevant SILs. The construction emissions of PM10 and PM2.5 would not expose sensitive receptors to substantial pollutant concentrations. All air quality impacts during construction would be considered short-term effects, and this analysis recommends a range of effective and comprehensive measures in proposed Conditions of Certification **AQ-SC1** to **AQ-SC5** to reduce construction impacts. This analysis shows that the localized impacts of construction criteria pollutant emissions would be less than significant with mitigation.

Operation

Less Than Significant Impact with Mitigation Incorporated. Operation-phase emissions of criteria pollutants are evaluated under criterion "b" of this analysis (**Table 5.1-6**), and emissions during operation would not exceed the Level B thresholds of significance (AQMD 2003b).

With the implementation of recommended Conditions of Certification for operation site dust control (**AQ-SC6**) and for implementing stationary source permit conditions for the emergency generator (**AQ-SC7** through **AQ-SC9**), the operation emissions would be sufficiently reduced and controlled consistent with applicable requirements. Because operation emissions would fall below the thresholds, no further analysis is necessary of the ambient air quality impacts of criteria pollutant emissions during operation. Operation emissions of criteria pollutants would not expose sensitive receptors to substantial pollutant concentrations, and this impact would be less than significant with mitigation.

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

This section considers impacts that may arise from emissions other than criteria air pollutants, such as emissions that may lead to odors. Toxic air contaminants are addressed separately in the Public Health section.

Construction

Less Than Significant Impact. Minor odor sources during construction activities include diesel exhaust from heavy-duty equipment. Odors from construction activities within the site would be temporary in nature and dissipate as a function of distance. Accordingly,

construction of the project is not expected to involve sources of emissions that may lead to odor impacts or impacts of emissions other than those pollutants identified elsewhere in this analysis.

Fugitive dust emissions can create a nuisance and adverse effects. To ensure that fugitive dust emissions would not occur at levels that could adversely affect a substantial number of people, the project would comply with AQMD Rule 3:16 for limiting visible emissions from fugitive dust, including unpaved roads, and would be subject to prohibitions on creating nuisances in the California Health & Safety Code. Therefore, the construction of the project would not result in other emissions, such as odors or dust, that could adversely affect a substantial number of people, and construction would have a less than significant impact.

Operation

Less Than Significant Impact. After construction concludes and routine operation commences, the wind energy generation facility would have no notable sources of emissions other than from mobile sources and the propane emergency generator described elsewhere in this analysis.

Nuisance impacts would not be likely to occur during operation or maintenance activities. The project would not result in odors or other emissions that could adversely affect a substantial number of people and would have a less than significant impact related to odors. In conclusion, staff finds that the project would not likely create objectionable odors affecting a substantial number of people, and operation would have a less than significant impact.

5.1.2.3 Cumulative Impacts

Less Than Significant Impact with Mitigation Incorporated. The conclusion for cumulative impacts to criteria air pollutant concentrations relies on the quantified emissions and the modeled concentrations presented above.

Under environmental checklist criterion “b,” staff concludes that the project’s criteria pollutant emissions would not occur at rates that could be cumulatively significant. Aside from PM10 and PM2.5 during construction, the project’s emissions of criteria pollutants and precursors would not exceed any threshold of significance. Under environmental checklist criterion “c,” staff presents the results of the staff’s independent air quality impact analysis for PM10 and PM2.5 during construction with mitigation. The total air quality impacts include background concentrations as a means of capturing the effects of existing sources in the cumulative conditions.

The local cumulative PM10 and PM2.5 concentrations that occur above the most-stringent standards are dominated by the combined effects of existing, background stationary and mobile sources. Because the overall cumulative impact to PM10 and PM2.5 exceed the standards, the proposed project would contribute to a significant cumulative impact during short-term construction. Based on the proposed project’s

individual impact being below the thresholds of the PM10 and PM2.5 SILs for all sensitive receptor locations, the project's incremental contribution to the cumulative impact would not be cumulatively considerable. The project's contribution to the cumulative PM10 and PM2.5 impacts would be less than significant.

Thus, staff concludes that the project would not result in a cumulatively considerable net increase of any criteria air pollutant, and the project's potential to contribute to the cumulative impact of criteria pollutant concentrations would be less than significant with mitigation incorporated.

5.1.3 Project Conformance with Applicable LORS

Table 5.1-9 includes staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.1-9 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Clean Air Act	
40 Code of Federal Regulations (CFR) Part 51, Nonattainment NSR Program	**Yes.** New source review requirements are implemented through Shasta County AQMD rules and regulations. Conditions of Certification **AQ-SC7** through **AQ-SC9** would ensure local AQMD permit conditions are satisfied.
40 CFR Part 52, PSD Program	**Not applicable.** Proposed project would not have the potential to emit at levels that could trigger applicability of the PSD program
40 CFR Part 60, NSPS Subpart JJJJ	**Yes.** Applies to proposed project's propane-fueled stationary emergency generator engine. Project owner would purchase a certified engine and operate it according to manufacturer's instructions. See Conditions of Certification **AQ-SC7** and **AQ-SC8**.
State	
California Health and Safety Code	
Section 41700, Nuisance Provisions	**Yes.** Applies to all of the proposed project's emitting activities and sources. To avoid the potential for injury, detriment, nuisance, or annoyance this analysis includes Condition of Certification **AQ-SC1** to **AQ-SC4** for minimizing visible dust during construction and **AQ-SC6** for controlling dust from unpaved access roads.
Local	
Shasta County General Plan	

TABLE 5.1-9 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Air Quality Element	**Not applicable.** Includes policies applicable to Shasta County coordination with air quality resource agencies and County land use decisions. This analysis includes mitigation and Conditions of Certification to reduce air quality impacts to below levels of significance.
Shasta County AQMD	
Rule 2.1, New Source Review	**Yes.** This analysis includes Conditions of Certification **AQ-SC7** through **AQ-SC9** for stationary source permit conditions.
Rule 2:1A, Permits Required	**Yes.** Applies to proposed project's propane-fueled stationary emergency generator engine. Conditions of Certification **AQ-SC7** through **AQ-SC9** for stationary source permit conditions. Rule 2:1A includes provisions for paving on-site access roads, subject to exclusions. The proposed project area is within the timberlands "resource" designation where road paving would not be required. This analysis includes Condition of Certification **AQ-SC6** for controlling dust from unpaved access roads.
Rule 3:16, Fugitive, Indirect, or Non-Traditional Sources	**Yes.** Project activities, including earth-moving, construction, demolition, bulk storage, and conditions resulting in wind erosion, are subject to opacity and visible dust emissions standards and must apply reasonably available control measures (RACMs). See Conditions of Certification **AQ-SC1** to **AQ-SC4** and **AQ-SC6**.
Rule 3:28, Stationary Internal Combustion Engines	**Yes.** Applies to proposed project's propane-fueled stationary emergency generator engine. This source would be limited to no more than 100 hours per year, and administrative recordkeeping and permitting requirements would apply. See Conditions of Certification **AQ-SC7** through **AQ-SC9**.

5.1.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of certification, the project would have a less than significant impact related to air quality and would conform with applicable LORS. Staff recommends adopting the conditions of certification as detailed in subsection "5.1.5 Proposed Conditions of Certification" below.

5.1.5 Proposed Conditions of Certification

The following proposed conditions of certification include both measures to mitigate environmental impacts and ensure conformance with applicable LORS.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification AQ-SC3, AQ-SC4 and AQ-SC5 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification AQ-SC3, AQ-SC4, and AQ-SC5.

Verification: At least 30 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 15 days from the date of receipt.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in AQ-SC4 from leaving the project site. Any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

Report monthly on the following fugitive dust mitigation measures that shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by AQSC2:

a. The main access roads through the facility will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction, and delivery areas for operations

materials (chemicals, replacement parts, etc.) will be paved or treated prior to taking initial deliveries.

b. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be as efficient as or more efficient for fugitive dust control than CARB approved soil stabilizers, and that shall not increase any other environmental impacts, including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading; and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.

c. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

d. Visible speed limit signs shall be posted at the construction site entrances.

e. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

f. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

g. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

h. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

i. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

j. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

k. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the

construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

l. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

m. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least two feet of freeboard.

n. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

o. Options to open burning of vegetative material on the project site shall be used by the project owner unless otherwise deemed infeasible by the AQMD. Examples of suitable options are chipping, mulching, and conversion to biomass fuel.

p. The project owner shall be responsible for applying (according to manufacturer 's specifications) nontoxic soil stabilizers to all inactive construction areas (previously graded areas that remain inactive for 96 hours) in accordance with the Shasta County Grading Ordinance.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

A. A summary of all actions taken to maintain compliance with this condition;

B. Copies of any complaints filed with the District in relation to project construction; and

C. Any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing the additional mitigation

measures described in the verification below and how they will be implemented to meet these fugitive dust control performance standards.

The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that visible dust plumes as defined above are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The project owner may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include:

A. A summary of all actions taken to maintain compliance with this condition;

B. Copies of any complaints filed with the District in relation to project construction; and

C. Any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the AQCMP mitigation measures shall require prior and CPM notification and approval.

The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by AQSC2:

a. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

b. All construction diesel engines with a rating of 25 hp or higher shall meet, at a minimum, the Tier 4 Final California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 4 Final engine is not available for any off-road equipment larger than 50 hp, a Tier 4 Interim or Tier 3 engine shall be used or that equipment shall be equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.

   1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question; or
   2. The construction equipment is intended to be on site for 10 days or less; or
   3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

c. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "b" occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists:

   1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.
   2. The retrofit control device is causing or is reasonably expected to cause engine damage.
   3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.
   4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly

maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

f. Construction equipment will employ zero-emission or hybrid powertrains and electric motors when feasible.

Verification: The AQCMM shall include in the Monthly Compliance Report the following to demonstrate control of diesel construction-related emissions:

A. A summary of all actions taken to control diesel construction related emissions;

B. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM, and the AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 Operation Site Dust Control: The project owner shall provide a site dust control plan that: describes the wind erosion control techniques such as windbreaks, water, and chemical dust suppressants that shall be used on areas that could be disturbed by vehicles or wind; and identifies the location of signs throughout the facility that will limit traveling on unpaved access roads to wind turbine generator maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on unpaved access roads, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

Verification: At least 60 days prior to start of commercial operation, the project owner shall submit to the CPM a copy of the plan that identifies the dust and erosion control procedures that will be used during operation of the project and that identifies all locations of the speed limit signs. At least 60 days after commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limit.

AQ-SC7 Emergency Generator Emissions Standards: The emergency generator and associated propane-powered engine procured for this project will meet or exceed the NSPS Subpart JJJJ emission standards for the model year that corresponds to their date of purchase. The project owner shall conduct monitoring and maintain

operating records in conformance with NSPS Subpart JJJJ, known as the ICE NSPS (40 C.F.R., § 60.4230, et al.).

Verification: The project owner shall submit the emergency engine specifications to the CPM at least 30 days prior to purchasing the engine for review and approval.

AQ-SC8 General Shasta County AQMD Provisions: The project owner shall comply with the following provisions recommended by the AQMD (District):

Your facility must continue to comply with all applicable Federal, State, and local air pollution regulations.

A violation of any of the applicable regulations will constitute grounds for enforcement action.

You will periodically receive update forms that must be completed and returned to the CPM and District on a timely basis.

Any anticipated change in equipment shall be reported to the CPM and District prior to installation in order for the CPM in consultation with the District to determine if an application for an Authority to Construct is necessary.

This designation is not transferable from either one location to another, one piece of equipment to another, or from one person to another.

Equipment is to be maintained so that it operates as it did when the designation was issued.

The CPM in consultation with the District reserves the right to amend this designation, if the need arises, in order to ensure compliance of this facility or to abate any public nuisance.

Periods of excess emission levels with respect to emission limitations specified in any Condition of Certification or District Authorization to Operate shall be reported to the CPM and District within four (4) hours of the occurrence. In no event, shall the equipment be operated in a manner that creates excessive emissions beyond the end of the first shift or twenty-four (24) hours, whichever occurs first.

The right of entry described in the California Health and Safety Code (CH&SC) Section 41510, Division 26, shall apply at all times.

The operating staff of this facility shall be advised of and familiar with all the Conditions of Certification and conditions of any District Authorization to Operate.

This facility is subject to all applicable requirements of the Air Toxics “Hot Spots” Information and Assessment Act of 1987, as cited in the CH&SC Section 44300 et seq.

Verification: At least 60 days prior to start of commercial operation, the project owner shall submit to the AQMD and CPM a copy of a compliance plan for the general provisions.

AQ-SC9 Emergency Generator Shasta County AQMD Provisions: The project owner shall operate and maintain the emergency generator in compliance with the following provisions recommended by the AQMD (District):

Visible emissions from the operation of the engine shall not be discharged for a period or periods aggregating more than three (3) minutes in any one (1) hour which are as dark or darker than Ringelmann 2 or equivalent 40% opacity as determined by EPA Method 9.

Daily engine operation records shall be maintained. These records shall be retained for a period of two (2) years and shall be made available for review upon request of CPM and/or the Air Pollution Control Officer (APCO). Daily engine records shall include: a. Total recorded hours of operation b. Date(s) and type of maintenance performed.

Operation for testing and maintenance purposes shall be limited to no more than one hundred (100) hours per year for the engine.

Operation for testing and maintenance purposes shall be limited to no more than fifteen (15) hours per any twenty-four (24) hour period for the engine.

The subject engine shall be fired exclusively on propane. Any change in the type of fuel used shall first be reviewed and approved by the CPM in consultation with the District.

A non-resettable hour meter shall be installed on the engine.

Verification: The project owner shall submit the emergency engine specifications to the AQMD and CPM at least 30 days prior to purchasing the engine for review and approval.

5.1.6 References

AQMD 2003a – Shasta County Air Quality Management District (AQMD). Environmental Review Guidelines, Procedures for Implementation the California Environmental Quality Act. November 2003. Accessed on: January 11, 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/air_quality/page/2415/scaqmd-ceqa-guidelines.pdf

AQMD 2003b – Shasta County Air Quality Management District (AQMD). Protocol for Review Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act. November 2003. Accessed on: January 11, 2024. Accessed online at:

https://www.shastacounty.gov/sites/default/files/fileattachments/air_quality/page/2415/scaqmd-ceqa-land-use-protocol.pdf

AQMD 2021 – Shasta County Air Quality Management District (AQMD). Northern Sacramento Valley Planning Area 2021 Triennial Air Quality Attainment Plan. Prepared by the Sacramento Valley Air Quality Engineering and Enforcement Professionals. Accessed on: January 9, 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/air_quality/page/2410/2021_nsvaq_attainment_plan.pdf

AQMD 2023 – Shasta County Air Quality Management District (AQMD). SCAQMD ATC Application Completeness Letter, dated August 16, 2023. (Also cited as FWPA TN 251630). Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

AQMD 2024 – Shasta County Air Quality Management District (AQMD). Input on the Opt-in Application for Certification of the Fountain Wind Project, dated February 23, 2024. (Also cited as FWPA TN 254693). Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CARB 2016 – California Air Resources Board (CARB). Ambient Air Quality Standards Table. Revised May 4, 2016. Accessed on: January 10, 2024. Accessed online at: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf

CARB 2022 – California Air Resources Board (CARB). Area Designations for State Ambient Air Quality Standards PM10. Accessed on: January 8, 2024. Accessed online at: https://ww2.arb.ca.gov/sites/default/files/2023-02/State_2022_PM10.pdf

CARB 2024a – California Air Resources Board (CARB). California Air Quality Data Statistics (iADAM). Accessed on: January 19, 2024. Accessed online at: https://www.arb.ca.gov/adam/topfour/topfour1.php

CARB 2024b – California Air Resources Board (CARB). California Ambient Air Quality Standards. Accessed on: January 19, 2024. Accessed online at: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

CARB 2024c – California Air Resources Board (CARB). California State Implementation Plans. Accessed on: January 19, 2024. Accessed online at: https://ww2.arb.ca.gov/our-work/programs/california-state-implementation-plans/about

FWPA – Fountain Wind Project Application (TN 248288-1 through TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250273). AIR-001_013_014 Response Memo, dated May 23, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250274). AIR-001 Construction Assumption, dated May 23, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251208). AQ Responses, dated July 27, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254771). Fountain Wind Traffic Study, dated March 1, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254767). AQ Tech Memo, dated March 1, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2004 – Shasta County (Shasta County). Shasta County General Plan. Amended through September 2004. Accessed on: January 10, 2024. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan

5.2 Biological Resources

This section describes the biological resources present or with the potential to occur in or near the proposed Fountain Wind Project (project). In addition, this section presents the regulatory background, discusses impacts associated with the construction and operation of the proposed project, and identifies conditions of certification (COCs) to reduce impacts to sensitive biological resources where possible.

Staff concludes that the project will result in significant and unavoidable impacts to biological resources by two distinct means. First, significant and unavoidable impacts to biological resources related to the potential for a wildfire either started on site, or coming to the site, to more quickly spread to nearby national forests and other wildlands due to the wind turbines obstructing aerial firefighting and impacting fire suppression activities. A more rapidly spreading fire can subject individual species on and off site, especially in the national forests, to direct and indirect mortality as well as destroy habitat, remove access to foraging and reduce food sources, remove important sheltering sites, alter water chemistry, and foul water ways with ash and debris. Second, significant and unavoidable impacts to biological resources related to the expected mortality of birds, bats, and insects from collisions with the turbines.

The conclusions of this section related to a more rapidly spreading fire are based on the analysis and conclusions set forth in Section 5.7, Hazards, Hazardous Materials, and Wildfire. Specifically, Section 5.7, pages 5.7-17 to 5.7-18, discusses fire modeling under different scenarios including with and without the use of certain aerial firefighting assets. The modeling shows increased spread of wildfire. The modeling revealed that under the modeled scenarios of two ignition locations near the southwest corner of the project site and near the west central edge of the project, in the 6-hour period with no flight restrictions assumed scenario the fire areas range from 275 acres to 660 acres, respectively, and for the 24-hour with flight restrictions scenario the fire area grows significantly and ranges from 7,485 acres to 9,300 acres. Further, Section 5.7 at page 5.7-18 describes ember spotting, and notes it is a behavior common in severe wildfires, where embers lofted ahead of the main fire front create new ignitions. Ember spotting has allowed fires to “jump” roadways and fuel breaks in multiple California wildfires, notably including the 2024 Park Fire and the 1992 Fountain Fire. A fire that can more rapidly spread because certain aerial firefighting assets are impacted by the project’s turbines, combined with conditions that favor ember spotting, risk reaching and destroying habitat in nearby national forests.

The analysis in this section is based on information described in numerous technical studies and surveys conducted by the Applicant, the Environmental Impact Report (EIR) prepared by the Shasta County Planning Department, independent review of existing literature, peer reviewed studies and reports, coordination with staff from regulatory agencies, and a review of electronically filed comments. A one-day reconnaissance level survey of the site was also conducted.

The Applicant has filed a large number of technical reports, studies and other data that were referenced by staff when preparing the analysis. Each of these studies are referenced below and are generally organized by species or subject.

General Site Assessments

- Site Characterization Study, Western EcoSystems Technology, Inc. (FWPA, TN 248318)

Sensitive Plants

- 2018 Rare Plant and Vegetation Mapping, Western EcoSystems Technology, Inc. (FWPA, TN 248308-7)
- 2019 Rare Plant and Vegetation Mapping, Western EcoSystems Technology, Inc. (FWPA, TN 248308-8)
- 2021 Rare Plant Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248308-1)
- RarePlantSpotCheck_SurveyPlan_06092023, Western EcoSystems Technology, Inc. (FWPA, TN 251061)
- Fountain 2023 Rare Plant Spot Check Report_092823, Western EcoSystems Technology, Inc. (FWPA, TN 253167)

Amphibian Studies

- 2018-2019 Foothill Yellow-legged Frog Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248305-2)
- 2018 Foothill and Cascades Frog Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248305-4)
- eDNA Foothill Yellow-legged Frog Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248308-2)

Avian Studies

- 2017 Raptor Nest Survey Report, Western EcoSystems Technology, Inc. (FWPA, TN 248305-1)
- 2018 Eagle Nest Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248305-3)
- 2018 Willow Flycatcher Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248306-1)
- 2019 Nest Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248306-2)
- 2019 Willow Flycatcher Habitat Assessment, Western EcoSystems Technology, Inc. (FWPA, TN 248306-3)
- 2018 Northen Goshawk Surveys, Western EcoSystems Technology, Inc. (FWPA, TN 248306-4)

- Northern Goshawk Memo, Western EcoSystems Technology, Inc. (FWPA, TN 248308-4)
- 2018 Great Gray Owl Habitat Assessment, Western EcoSystems Technology, Inc. (FWPA, TN 248308-5)
- 2019 Avian Use Study, Western EcoSystems Technology, Inc. (FWPA, TN 248309-1)
- 2021 Spotted Owl Memo, Western EcoSystems Technology, Inc. (FWPA, TN 248309-4)
- 2018 Avian Use Study, Western EcoSystems Technology, Inc. (FWPA, TN 248309-5)
- CSO_SurveyPlan_2023_06092023, Western EcoSystems Technology, Inc. (FWPA, TN 251062)
- fwp_CSO_SurveyPlan_2023, Western EcoSystems Technology, Inc. (FWPA, TN 251112)
- 2023 California Spotted Owl Surveys_111323, Western EcoSystems Technology, Inc. (FWPA, TN 253168)
- Condor Risk Assessment, Western EcoSystems Technology, Inc. (FWPA, TN 248307-1)
- Spotted Owl Risk Assessment, Western EcoSystems Technology, Inc. (FWPA, TN 248307-5)
- Nocturnal Migrant Risk Summary, Western EcoSystems Technology, Inc. (FWPA, TN 248308-6)

Bat Studies

- Bat Survey Report, Western EcoSystems Technology, Inc. (FWPA, TN 248307-3)

Jurisdictional Delineation Documents

- LSAA Summary of Aquatic Impacts, Stantec Consulting Services, Inc. (FWPA, TN 248329-1)
- LSAA Application, Fountain Wind LLC (FWPA, TN 248329-2)
- LSAA Aquatic Resources Report, Stantec Consulting Services, Inc. (FWPA, TN 248329-4)
- LSAAA Crossing Designs, Westwood Professional Services, Inc. (FWPA, TN 248329-5)
- LSAA Figure 1 Project Overview, Stantec Consulting Services, Inc. FWPA, TN 248329-6)
- LSAA Figure 2 Aquatic Impacts, Stantec Consulting Services, Inc. (FWPA, TN 248329-7)
- LSAA Final MMRP, Environmental Science Associates (FWPA, TN 248329-8)
- LSAA Site Photos, Stantec Consulting Services, Inc. (FWPA, TN 248329-9)

- LSAA Special Status Species Table (FWPA, TN 248329-10)

Shasta County Environmental Impact Report

- CEQA Initial Study, Stantec Consulting Services, Inc. (FWPA, 248297-2)
- CEQA Scoping Report Part 1, Environmental Science Associates (FWPA, TN 248301)
- DEIR Biological Resources, Environmental Science Associates (FWPA, TN 248288-6)
- FEIR Vol1, Environmental Science Associates (FWPA, TN 248289-1)
- FEIR Vol2, Environmental Science Associates (FWPA, TN 248289-2)
- FEIR Appendices Part 1, Environmental Science Associates (FWPA, TN 248294)

Memos and Responses from Data Requests

- Bio Resources Figure Index (FWPA, TN 248307-4)
- Golden Eagle Survey Clarification Memo, Western EcoSystems Technology, Inc. (FWPA, TN 248308-3)
- Rare Plant Clarification Memo, Western EcoSystems Technology, Inc. (FWPA, TN 248308-9)
- Response to 2018-2019 Raptor Survey Questions, Western EcoSystems Technology, Inc. (FWPA, TN 248309-2)
- Response to Informal Consultation to Request, Western EcoSystems Technology, Inc. (FWPA, TN 248309-3)
- General Plan Consistency Matrix, Stantec Consulting Services, Inc. (FWPA, TN 249635)
- Laws, Ordinances, Regulations, and Standards Consistency Matrix, Stantec Consulting Services, Inc. (FWPA, TN 249636)
- fwp_bio-001_species_list, Stantec Consulting Services, Inc. (FWPA, TN 249926)
- fwp_bio-002_005_026_027_030_spotted_owl_memo, Western EcoSystems Technology, Inc. (FWPA, TN 249927)
- fwp_bio-019_ggo_records, Stantec Consulting Services, Inc. (FWPA, TN 249928)
- fwp_bio_003_007_008_009_representative_site_photos, Stantec Consulting Services, Inc. (FWPA, TN 249929)
- fwp_bio-019_ggo_records_table, Stantec Consulting Services, Inc. (FWPA, TN 249930)
- fwp_bio-015_goea_mous, Western EcoSystems Technology, Inc. (FWPA, TN 249937)
- fwp_bio_response_spreadsheet, Stantec Consulting Services, Inc. (FWPA, TN 249939)
- bio_fwp_round2_responses, Stantec Consulting Services, Inc. (FWPA, TN 250506)

- fwp_WR2-04_SurfaceWaterHydrology24K, Stantec Consulting Services, Inc. (FWPA, TN 250814)
- fwp_rwqcb_responses_2023-0705, Stantec Consulting Services, Inc. (FWPA, TN 250949)
- fwp_data_request_responses_2023-0721, Stantec Consulting Services, Inc. (FWPA, TN 251114)
- fwp_fire_Fountain Wind Tech Report_December 4, 2023 (FWPA, TN 253505)

Table 5.2-1 provides a summary of the report findings, and the conclusions made by the applicant. This data was reviewed and incorporated into the analysis of the EIR where appropriate. Staff augmented this data when necessary and made independent conclusions based on a review of the data, coordination with regulatory agencies, and an evaluation of potential impacts that may occur from the development of the project.

In addition to the technical reports submitted by the Applicant, the public and other entities provided numerous documents and technical studies addressing potential impacts to plants and wildlife that could occur from the construction of the proposed project. Some of these raised concerns regarding the mortality estimates made at the nearby Hatchet Ridge Wind Farm and expected mortality that could occur at the Proposed project site. For example, numerous commentors noted that mortality estimates may have been underestimated due to the size of the search area, number of monitoring says, and other factors. Staff considered these and other comments during the evaluation of potential impacts presented in this analysis.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

TN	Survey Dates	Survey Type	Survey Area/Project Configuration	Results	Notes
FWPA TN 253167	June 15-16, 2023 August 29-30, 2023	Rare Plant Spot-check Survey	Twenty sample locations were investigated in a variety of habitats near areas of potential disturbance. Surveys focused on high quality habitat (wet montane meadows, mixed montane riparian scrub, etc.). Targeted species for 2021 survey was used for this survey. Surveys generally followed *2018 CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.*	No sensitive species identified. The report concluded that impacts to rare plants are not anticipated during project construction.	"Sample locations included areas representing rock outcrops (two locations), wet montane meadows (three locations), mixed montane riparian scrub (eight locations), mixed montane riparian forest (three locations), and unburned mixed conifer (four locations) vegetation communities." 2 survey periods (all 20 locations visited each time)
FWPA TN 253168	June 19-September 8, 2023	California Spotted Owl Survey	Protocol surveys conducted in suitable nesting and roosting habitat within 0.25-mile buffer of project infrastructure. Surveys largely aligned with the *Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls – 2012 Revision.*	Round 1: Female owl heard approximately 0.3-miles south of closest project disturbance; could not locate during daytime follow-up. Round 2-3: No CSO detected (Screech owl and great horned owl detected during round 3) Round 4: A pair was detected approximately 1-mile northeast of the 2021 nest (in an area that is not CSO habitat); could not located during daytime follow-up. Another female was detected approximately 1-mile south of nearest disturbance; could not located during daytime follow-up.	Stations were the same locations as the 2021 survey: Included 6 rounds of surveys. Surveys delayed due to weather. Historical activity center within 0.5 miles of project.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

				Round 5: A pair was detected near the previous detection from Round 1; could not located during daytime follow-up. Round 6: No CSO detected. Additional survey was conducted where CSO was detected in Round 5 (third visit); no CSO detected.	
FWPA TN 248309-4	May 6 -July 20, 2021	Spotted Owl Survey	Medium to high suitable nesting and roosting habitat was surveyed within 0.25-mile buffer of project site infrastructure. Surveys aligned with *Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls – 2012 Revision.*	An owl was heard approximately 0.25-miles southeast of the closest proposed turbine. A daytime follow-up occurred, and a nesting pair was discovered on USFS land located 0.4 miles northeast of nearest proposed turbine. Another pair of owls were detected less than a mile from the previous detection. A daytime follow-up determined that it was the same male from the previously documented pair (same color-coded leg band). This same male was heard and spotted a third time approximately 0.3 miles away from the nearest proposed turbine. The report concludes that likelihood of spotted owls nesting within 0.25-mile buffer is low.	36 fixed survey stations; 6 surveys done at each station (6 survey days). Surveys consisted of 10-minute acoustic playback.
FWPA TN 248308-1	May 24-25, 2021 July 27-28, 2021	Rare Plant Survey	Pedestrian transects were conducted throughout survey corridors which were in areas of	No sensitive plant species were identified. The report concludes	Used the CNDDB/CNPS query from 2018.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

			potential disturbance. 2021 surveys focused on areas not included in 2018 and 2019 surveys. Surveys followed *2018 CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.*	that no impacts to rare plants are anticipated.	69 rare plants found via desktop review (no suitable habitat within project area for 22/69 species). There are two federal-listed plants in the region, but the report concludes that both are unlikely to occur (*Tuctoria greenei* and *Orcuttia tenuis*) because there are no vernal pools or grasslands present in the survey corridors.
FWPA TN 248308-4	June 21-24, 2021 July 12-15, 2021	Northern Goshawk Surveys	Acoustic surveys were done in areas with suitable nesting habitat (forest stands 40 years or older) that were located within 0.25-mile buffer of project infrastructure. Surveys used techniques in the *Northern Goshawk Inventory and Monitoring Technical Guide*.	There were no visual or auditory detections of goshawks. The report concludes that there is a low risk of impacts to Northern goshawk. However, it does acknowledge that more surveys may need to be done if the project will impact suitable goshawk habitat.	276 fixed survey stations at 200-meter intervals along parallel transects. Two rounds of 4-minute broadcasting were conducted at each station during mid to late nesting season.
FWPA TN 248307-5	February 2020	Spotted Owl Risk Assessment	Three historical activity centers (AC) are located within 2-miles southeast and one historical activity center is located near the center of the project site. The central activity center was based on an observation of an individual bird of unknown sex (this AC was burned in Fountain Fire). The last known detection of CSO was individual birds in 1990 and 1994. The last known active nest was in	Project is in the transition zone between CSO and NSO ranges. According to this report, 73.9% of project site has been burned by Fountain Fire which means it is not suitable habitat for owls. 21.2% of project site has moderately suitable habitat for CSO. 1.1% of highly suitable habitat. Loss of the moderately and highly suitable habitat not likely to impact CSO in the	In 2018, WEST confirmed there is no habitat for CSO at the central AC location.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

			1992. The most recent detection was of an adult and two young (SHA0124) 1.2 miles southeast of project site in 2008.	region due to larger amounts of suitable habitat outside the project area.	
FWPA TN 248307-1	February 2020	Condor Risk Assessment	April 2019 an Environmental Assessment (EA) was prepared regarding condor reintroduction to Redwood National Park (still under review). Proposed reintroduction site is 110 miles from the project area. Likelihood in project area is unknown but will most likely be used as foraging ground for Condors.	Closest suitable habitat for Condors are the cliffs along the Pit River. The need for minimization measures will depend on if the condor population is designated as essential or non-essential experimental.	Fountain Fire has changed habitat suitability for condors, making it less ideal.
FWPA TN 248306-3	2019	Willow Flycatcher Habitat Assessment	Area surveyed was determine by desktop review, following the *CDFW Willow Flycatcher Habitat Model*. An additional 5.6 acres of survey area was identified that was not included in 2018 survey (due to project boundary change). This area was assessed in the field and ruled out due to unsuitable conditions (dry upland area).	No additional surveys were conducted due to no new habitat detected.	The report states that criteria for suitable habitat are cover component, distance to perennial water, and species range.
FWPA TN 248306-2	March 19 and 21, 2019 May 20 and 22, 2019	Aerial Surveys for Raptor Nests	Two bird surveys were conducted within the FWP project site with a 10-mile buffer for eagles and a 2-mile buffer for other raptors. For the first survey, within the 2-mile buffer surveyors focused on habitat features “typically used by raptors that build large, conspicuous nests.” Surveys within the 10-mile buffer was solely for eagle nests and focused on cliffs, rock	Thirteen occupied bald eagle nests were documented. Nine of these located within 10-mile buffer and four located just outside. On the second survey nine of the nests had 1-3 chicks. Four unoccupied nests found. Fifteen historic eagle nests couldn’t be found during surveys.	2 biologists per survey. When conducting the second survey past the 2-mile buffer, surveys focused on confirming already documented eagle nests. Helicopter stayed 100-500 ft above ground at speed

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

			outcrops, powerline structures, etc. For the second survey the 2-mile buffer was surveyed similarly to the previous survey. Regarding the 10-mile buffer survey for eagle, the second surveyed consisted of confirming the status of previously documented nests. These surveys followed USFWS recommendations (2 rounds of surveys completed a minimum of 30 days apart during nesting season).	Closest occupied bald eagle nest is located at Lake Margaret (3-miles east of project area); this nest is part of a USFWS movement study. Six occupied bald eagle nests are located along Pit River. Other raptor nests included an occupied osprey nest and occupied raven nests.	50 mph (reduced if nest found).
FWPA TN 248308-8	May 29 – June 3, 2019 July 30 – August 2, 2019	Rare Plant Survey	Pedestrian transects were conducted throughout areas of potential disturbance. Surveys followed *2018 CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.*	The vegetation within turbine pad areas mainly consisted of native plants. No rare plant species were found during surveys. The report concludes that no impacts to rare plants are anticipated. 8 vegetation communities: *Pinus ponderosa* Forest alliance, *Pinus ponderosa* Forest alliance-logged, *Abies concolor-Pseudotsuga menziesii* Forest alliance, *Quercus kelloggii* Forest alliance, *Acer glabrum* provisional shrubland alliance, *Arctostaphylos patula* shrubland alliance, *carex utriculate* herbaceous alliance, *Agrostis - festuca arundinacea* herbaceous semi natural alliance.	Development corridors were provided in GIS format by the project proponent (=survey areas). CNDDB (10-mile buffer) and CNPS (Shasta County) searched prior to survey. Invasive plants mapped near roadsides. 69 rare plants found via desktop review (no suitable habitat within project area for 22/69 species). There are two federal-listed plants, but the report concludes that both are unlikely to occur (*Tuctoria greenei and Orcuttia tenuis*) because

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

				Main invasive plants: mullein, bull thistle, klammath weed, and hound's tongue.	there are no vernal pools or grasslands present. 2018 surveys focused on northern part of project area and 2019 focused on southern area. *Acer glabrum* provisional shrubland alliance may be considered a sensitive community; covers 1036 acres of evaluation area but only 31 acres of development corridors.
FWPA TN 248308-2	September 25-27, 2019	eDNA Foothill Yellow-legged Frog Surveys	Conducted desktop review of potential suitable stream cross-ings. Field assessment occurred to verify predicted suitability and to identify stream crossings not predicted. Collection occurred in all suitable stream crossings within the project site. Collected three samples (1 L each) at 24 streams (25 sampling stations).	eDNA survey results were negative for FYLF. The report concludes that no impacts to FYLF are anticipated.	CDFW recommended eDNA surveys. Survey corridors increased from 500 to 700 feet. Streams that crossed below long spans of overhead collection lines were not surveyed.
FWPA TN 248308-5	2018	Great Gray Owl Habitat Assessment	Habitat suitability (nesting and foraging) identified during desktop review using CDFW GIS model. This model is generally consistent with *Northwest Forest Plan* (NWFP). Biologist assessed habitat identified by desktop review and in the field along with potential habitat not predicted by the GIS-based model.	Only one nesting habitat predicted by desktop review (bio only surveyed habitat from a distance because it was located on private land); this area was determined to not meet minimum criteria for suitability in the field.	The report concluded that species specific surveys are not required because there is no suitable habitat within project area. The one potential habitat they ruled out is located on a private inholding; there-fore, won't be impacted by project construction.
FWPA TN 248306-4	April 18-20, 2018 June 23-25, 2018	Northern Goshawk Surveys	Acoustic surveys occurred at the four historical goshawk	Only 2 out of 4 historical goshawk nests were found; one	Dawn acoustical surveys (2-hour session beginning

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

			occurrence areas using techniques in the *Northern Goshawk Inventory and Monitoring Technical Guide*.	was no longer suitable and the other was occupied by a great horned owl. No visual or auditory detections of goshawks. The report concluded that additional surveys may be needed if project will directly impact habitat suitable for goshawks.	.5 hour before sunrise) during courtship/nest building stage and broadcast acoustical surveys (walking transects 200-meters apart) during nestling/fledging stage.
FWPA TN 248305-3	April 18, 19, 21, 22, 23, 2018	Ground Eagle Nesting Survey	Eagle surveys were conducted at all previously documented (2017) bald eagle nests within the 10-mile buffer survey area that were accessible/viewable by public roads/access. Each survey lasted for a minimum of 4 hours unless the nest was documented as active before 4 hours. Each nest was only surveyed once.	10 nests total surveyed (13 nests in 2017) 5 were occupied – all nests 5 miles or more from project area. Other 5 nests activity could not be determined.	No helicopter surveys because CDFW requested applicant to obtain an MOU.
FWPA TN 248309-1	June 4, 2018 - March 31, 2019	Avian Use Study	Small and large bird fixed point count surveys conducted at 39 locations throughout the FWP project site. Each survey location consisted of an 800-meter radius survey plot. Survey followed *US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines, USFWS Eagle Conservation Plan Guidance (ECPG*), and CEC guidelines. Two separate surveys were conducted at each point every month. There was a 10-minute small bird survey followed by a 60-minute large bird survey.	10 sensitive species observed including: bald eagle, golden eagle, white pelican, northern goshawk, northern harrier, olive-sided flycatcher, yellow warbler, sand hill crane (subspecies unknown), Cassin's finch, Lewis's woodpecker. Higher waterbird use noted in year 2 (2019); five groups of sandhill cranes (316 observations). Year 1: 16 bald eagles (35 risk minutes); year 2: 6 bald eagles (5 risk minutes)	Same 39 locations and survey procedures as 2018 study. Total of 383 large bird surveys (22 species observed); did not survey some locations due to weather. Total of 383 small bird surveys (50 species observed)

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

FWPA TN 248305-2	June 18-22 & 29-30, 2019	Foothill Yellow-legged Frog Survey	Supplemental to 2018 FYLF survey due to altered project boundary. Conducted desktop review of potential suitable habitat. Field assessment occurred to verify predicted habitat suitability and to identify habitat not predicted by CWHR models. Conducted visual encounter surveys for adults and egg masses in the most suitable habitat within the project area. Surveys within the construction corridors included a 500-foot buffer.	No life stages of FYLF were observed. The Report concluded that it is unlikely that FYLF occur in or will immigrate into the project area. Concluded no impacts are expected.	Applicant consulted CDFW and USFWS 2017 and 2019 (CDFW visited site with WEST biologists). CDWF recommended eDNA as more effective than Visual encounter surveys.
FWPA TN 248308-7	May 21-29, 2018 July 30- August 3, 2018	Rare Plant Survey	Pedestrian transects were conducted in areas of potential disturbance. Surveys followed *2018 CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.*	The vegetation within turbine pad areas mainly consisted of native plants. No rare plant species were found during surveys. The report concludes that no impacts to rare plants are anticipated. 11 vegetation communities: mixed conifer forest-burned, mixed conifer forest- unburned, mixed montane riparian forest, mixed montane riparian scrub, mixed montane chaparral, black oak woodland, wet montane meadow, montane meadow, logged, rock outcrops, transmission line corridor. Main invasive plants: mullein, bull thistle, Klamath weed, hounds' tongue.	CNDDB (10-mile buffer) and CNPS (Shasta County) searched prior to survey. Invasive plants mapped near roadsides. 51 rare plants identified via desktop review; 36/51 had highest potential to occur (only 1 was state or federal listed, *Gratiola heterosepala*). All 51 species were targeted during rare plant survey.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

FWPA TN 248306-1	June 23-24, 2018 July 6, 2018	Willow Flycatcher Survey	Area surveyed was determine by desktop review along with in-field determination. These areas included a 300-foot buffer (3 areas total). Ten-minute listening periods occurred at a total of 17 survey stations prior to a minimum of 6-minute broadcast surveys. Suitable habitat was surveyed using CDFW protocol-level presence/absence surveys.	No individuals were detected during surveys.	The report states that criteria for suitable habitat included cover component, distance to perennial water, and species range. 3 total areas surveyed: 2=1.5 acres each, 1= 3 acres (total of 17 survey stations).
FWPA TN 248305-4	September 1-4, 2018	Foothill Yellow-legged and Cascades Frog Survey	Conducted desktop review of potential suitable habitat. Field assessment occurred to verify predicted habitat suitability and to identify habitat not predicted by CWHR models. Conducted visual encounter surveys for subadults and adults in the most suitable habitat within the project area. Surveys within the construction corridors included a 500-foot buffer.	No FYLF observed during visual surveys. Field-based habitat assessment for cascades frog determined that there is no suitable habitat within the project area. No formal cascade frog surveys were conducted. The Report concluded that it is unlikely that FYLF or cascades frog occur in the project area and no impacts are expected.	The project area is within CWHR habitat range for both species. The Report considered suitable habitat as mixed montane riparian forest, mixed montane riparian scrub, and wet montane meadow.
FWPA TN 248329-4	October 10, 2017-August 30, 2018 October 14-18, 2019	Aquatic Resource Field Survey	Delineated potential wetlands with the approach outlined in the *Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains Valleys and Coast.* Delineated non-wetland features based on ordinary high-water mark, bed, and banks.	There were approximately 38 acres of wetland and 13 acres of other waters. There were 206 wetlands (5 fresh emergent wetlands, 134 riparian wetlands, 5 seasonal wetlands, 12 vegetated ditches, 17 wetland meadows and 33 wetland seep/springs). There were 284 features designated as other waters (41 ephemeral streams, 110 intermittent streams, 21 non-vegetated	Survey area is 6,118.06 acres. 700-foot radius on turbine location, 200 to 400-foot corridor on roads, 300-foot corridor on electrical lines, 200-foot buffer around facilities, 100-foot buffer around staging areas.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

				ditches, 109 perennial stream segments, and 3 ponds).	
FWPA TN 248309-5	April 19, 2017- May 22, 2018	Avian Use Study	Small and large bird fixed point count surveys conducted at 39 locations throughout the FWP project site. Each survey location consisted of an 800-meter radius survey plot. Surveys followed *US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines, USFWS Eagle Conservation Plan Guidance (ECPG*), and CEC guidelines. Two separate surveys were conducted at each point every month. There was a 10-minute small bird survey followed by a 60-minute large bird survey.	10 sensitive species observed which included: bald eagle, golden eagle, white pelican, northern goshawk, northern harrier, olive-sided flycatcher, Vaux's swift, yellow warbler, sand hill crane (subspecies unknown), Cassin's finch. -Bald eagle observed during all four seasons (majority in winter).	Total of 531 large bird surveys (25 species observed); most common species is red-tailed hawk. Total of 531 small bird surveys (71 species observed). Only species in 800-meter (100 meter for small birds) radius were recorded. Surveys were during daylight hours.
FWPA TN 248307-3	April 30 – November 13, 2017	Bat Acoustic Survey Report	Acoustic surveys at seven locations for potential turbines and one location thought to be "attractive to bats" (Feature location). Six stations had microphones 5 feet off the ground and two stations had microphones 148 feet of the ground. The feature location had the microphone placed near ground level in a riparian meadow. Surveys consisted of a total of 1,301 detector-nights and recorded a total of 96,107 bat passes.	Ground microphones at potential turbine locations averaged 50.25 bat passes per detector-night while the raised microphones averaged 26.07. The feature station recorded an average of 260.74 bat passes per detector-night. Overall bat activity was greatest in summer. Fourteen bat species were detected (2 are SSC. These included: spotted bat and western mastiff bat). The two SSC species were only detected a total of seven passes on three separate nights.	Silver-haired bat, hoary bat, Mexican free-tailed bat, big brown bat, and California bat were most detected. Low frequency species accounted for 96% of bat passes at high sampling locations. Low frequency species spend more time at greater heights during the fall. High frequency bat numbers peaked in the summer. Hatchet Ridge studies show similar results and patterns.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

FWPA TN 248305-1	March 20, 2017 May 9, 2017	Aerial Surveys for Raptor Nests Using Helicopters	Two bird surveys were conducted within the FWP project site with a 10-mile buffer for eagles and a 2-mile buffer for other raptors. For the first survey, within the 2-mile buffer surveyors focused on habitat features "typically used by raptors that build large, conspicuous nests." Surveys within the 10-mile buffer was solely for eagle nests and focused on cliffs, rock outcrops, powerline structures, etc. For the second survey the 2-mile buffer was surveyed similarly to the previous survey. Regarding the 10-mile buffer survey for eagles, the second surveyed consisted of confirming the status of previously documented nests. These surveys followed USFWS recommendations (2 rounds of surveys completed a minimum of 30 days apart during nesting season).	Eleven occupied bald eagle nests were found within the 10-mile buffer. Nine out of eleven nests were active during at least one survey. Two nests were inactive. Six out of the nine active nests contained one to two chicks. One out of the nine active nests were undetermined during the second survey. Two out of the nine active nests became inactive during the second survey. No golden eagle nests were found. Six out of eleven bald eagle nests were located along Pit River. The closest nest was 2.9 miles east of the project boundary (this nest was the one that became inactive during the second survey). Other Raptors observed included: Two osprey nests, one red-tailed hawk nest, and two unoccupied nests (not eagle).	Helicopter stayed 100-500 ft above ground at speed 50mph (reduced if nest found). 2 biologists per survey.
FWPA TN 248318	October 19-21, 2016	Site Characterization Study	Evaluated area based on publicly assessable data and initial reconnaissance-level site visit. Information gathered during site visit includes plant communities, topographic and geological features, potential raptor nesting habitat, habitat for prey	Dominant land cover in the project area is evergreen forest (54.9%). There is also shrub/ scrub (38.3%) and herbaceous habitat (4.5%). The remaining 2.2% is deciduous forest, barren land, mixed forest, developed lands, emergent wetlands, and cropland.	Land cover in 2-mile buffer but not in project area: open water, highly developed land, woody wetlands. NWI shows 2% of project area as wetland habitat.

TABLE 5.2-1 SUMMARY OF SURVEYS CONDUCTED AT THE PROJECT SITE

			populations and potential bat roosting/foraging habitat.	There are 61 state listed or CNPS sensitive plants with some potential to occur within the project area. After narrowing down the list of special status plant species (by cross-reference, range, elevation, etc.) the report concluded there are two federal-listed plants that could occur however, the report concludes that both are unlikely to occur (*Tuctoria greenei* and *Orcuttia tenuis*) because they are associated with vernal pools and grasslands which were not present. Four CNPS species have been documented to occur within the project area including Butte morning glory, rattlesnake fern, northern clarkia, English peak greenbriar. The three sensitive habitats within 10-mile buffer include alkali seep, northern basalt flow vernal pool, and northern interior cypress forest (none in project area). Pit River drainage is home to hardhead and tule perch but is located 2.5 miles northwest of project area (streams within project area generally not suited for these fish). There are five bat species with potential to occur.	Hatchet Ridge 2 years fatality monitoring (44 turbines) = 2 red-tailed hawks, 1 sharp-shinned hawk, 1 turkey vulture, 42 bats. Report acknowledges that Bat, gray wolf, red fox analysis needs to be conducted.

5.2.1 Environmental Setting

Existing Conditions

Vegetation types within the project site and surrounding area are described to characterize botanical resources and wildlife habitat values. Biotic habitats suitable for the occurrence of special-status plant and wildlife species are also described below. For the purposes of analysis, the project site is defined as all areas subject to permanent and temporary impacts. This includes a buffer of approximately 130 feet from existing and new access roads and other project components, and a circular buffer of approximately 700 feet around the wind turbine generators (WTGs). It includes all access roads and areas between rows of turbines. The project area can be broadly defined as all areas surrounding the project site which would not be subject to disturbance but occur in adjacent habitat between the project components (i.e., roads, wind turbine generators, and other facilities). The project region includes all areas within 10 miles of the proposed project site and beyond.

Regional Setting and Background

The project would be located within the Cascades Ecological Region (ecoregion; Griffith et al. 2016), which is an 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, 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 and at higher elevations, subalpine meadows (FWPA, TN 248288-6). This region is a mountainous and conifer dominated forested region of Lassen County.

The topography of the region is complex and is characterized by steep hillsides, meadows, buttes, broad valleys, and peaks separated by deeply incised river valleys. These include Carberry Flat and Mountain, Fauries Peak, Fuller Flat and Mountain, Lookout Mountain, and Sanders Ridge (FWPA, TN 248307-2). The broader region is also home to the Lassen National Forest (LNF) and the Shasta-Trinity National Forest (STNF).

The broader region experiences a Mediterranean climate with distinct dry and wet seasons. The rugged terrain influences the climate, with varying temperatures depending on the elevations and location within the region. The patterns of mountains and hills contribute to the wide variations of localized winds, temperatures, and rainfall WRCC, 2007). The average annual precipitation is approximately 68 inches with an average annual snowfall of 70 inches (WRCC, 2019). Air temperatures range between an average January high of 58 degrees Fahrenheit (ºF), and an average July high of 99ºF. The annual average high is approximately 101ºF (FWPA, TN 248307-2).

Winds also follow daily patterns that play an important role in mountain regions. These patterns result from air density differences brought about by solar heating during the day and radiative cooling at night. In the morning hours, cool air from higher elevations

flows down the valleys, while later in the day, as the lower elevation air heats up, this pattern is reversed, and air flow heads up the canyon.

Like many parts of California, wildfires are common in this region and are a characteristic and defining feature of conifer and chapparal ecosystems. These fires periodically burn large tracts of land across the region. Although fire is an important process in natural ecosystems, large or mega complex wildfires pose a risk to public safety and ecosystem health. Wildfires can also have damaging effects on natural resources depending on their intensity and frequency.

Local Setting

The project site is located on privately owned and managed timber lands approximately 3 miles east of the community of Montgomery Creek, 7 miles west of Burney, and 28 miles northeast of Redding. California State Route 299 (SR 299) is located at the northern portion of the project site (see **Figure 3-2** in **Section 3, Project Description**). The Hatchet Ridge Wind Project is located approximately 1 mile to the east of the project. Much of the adjacent lands are also subject to timber harvest practices however, the LNF and STNF are located to the south and north and east of the site respectively (FWPA, TN 248288-6).

The Shasta County General Plan designates the project site as Timber (T); and the zoning designation is Timber Production (TP). Land uses within the 16,108-acre project area consist exclusively of managed timber lands traversed by a network of logging roads. SR 299 is an east-west highway that provides the only public access to the site. Surrounding lands consist of a privately owned ranch and Moose Camp, an approximately 50-cabin, 146-acre private recreational facility, which is located east of the project site (Moose Camp, 2023).

The topography within the project site and adjacent project area is characterized by gently rolling hills that transition to relatively steep, low mountains, with elevations ranging from approximately 2,156 feet (657 meters) in the southwestern corner of the Leasehold Area to 6,814 feet (2,077 meters) near Snow Mountain. The hills and valleys support a variety of ephemeral, intermittent, and perennial drainages. Some of these include the Richardson Creek, Little Hatchet Creek, Hatchet Creek, Carberry Creek, Goat Creek, North Fork, Montgomery Creek, Indian Spring, South Fork Montgomery Creek, Cedar Creek, North Fork Little Cow Creek, Little Cow Creek, and Mill Creek (FWPA, TN 248307-2). Most of these drainages convey flow to the north and west into the Pit River and contribute flow to the Sacramento River watershed.

Soils within the project site and adjacent project area are primarily composed of the Cohasset, Windy, McCarthy and Lyonsville-Jiggs series and range from stony to clay loams that have formed in residuum weathered from volcanic rock (FWPA, TN 248307-2).

Vegetation and Landforms

The dominant vegetation communities that occur in the project area reflect the existing land use of managed timber lands (see **Figure 5.2-1a** through **5.2-1g**). Managed timber lands are planted to provide the greatest level of timber production rather than promote species diversity more common in natural forest lands. In August 1992, the Fountain Fire burned approximately 50 percent of the project area. After the fire, the area was subject to a salvage logging operation and many burnt trees were either logged and removed from the site or felled in place. Following the salvage effort approximately 17 million seedlings were planted in areas previously supporting timber. The seedlings included ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and white fir (*Abies concolor*) placed at 10-foot (3.0-meter) spacing. Incense cedar was planted along stream buffers and native riparian vegetation has become re-established in many areas. The project area has also been subject to ongoing timber management activities which included the application of growth regulator herbicides to control areas colonized by various species of manzanita (*Arctostaphylos* spp.) and ceanothus (*Ceanothus* spp.) (FWPA, TN 248288-6).

Habitat currently present in the project area is largely a result of the planting that occurred after the Fountain fire and the management of existing timber stands. The area is dominated by early seral stands of Sierran mixed conifer forest with smaller amounts of mixed montane chaparral, logged areas, mixed montane riparian forest/ scrub, and various riparian plant communities. The overstory of conifer dominated areas include a combination of white fir, Douglas fir, incense cedar (*Calocedrus decurrens*), ponderosa pine, sugar pine (*P. lambertiana*), and some California black oak (*Quercus kelloggii*). Although some older stands of conifers are present, late seral forest is lacking primarily because of the Fountain fire and management of the area for timber production (FWPA, TN 248288-6). For further discussion about the quantity and quality of timber lands that are present on the project site, see Section 5.17 Forestry Resources.

In riparian areas, the vegetation varies but includes several species of willows (*Salix* spp.), thinleaf alder (*Alnus incana* ssp. *tenuifolia*), maples (*Acer* spp.), mountain dogwood (*Cornus nuttallii*), and California hazel (*Corylus cornata* var. *californica*).

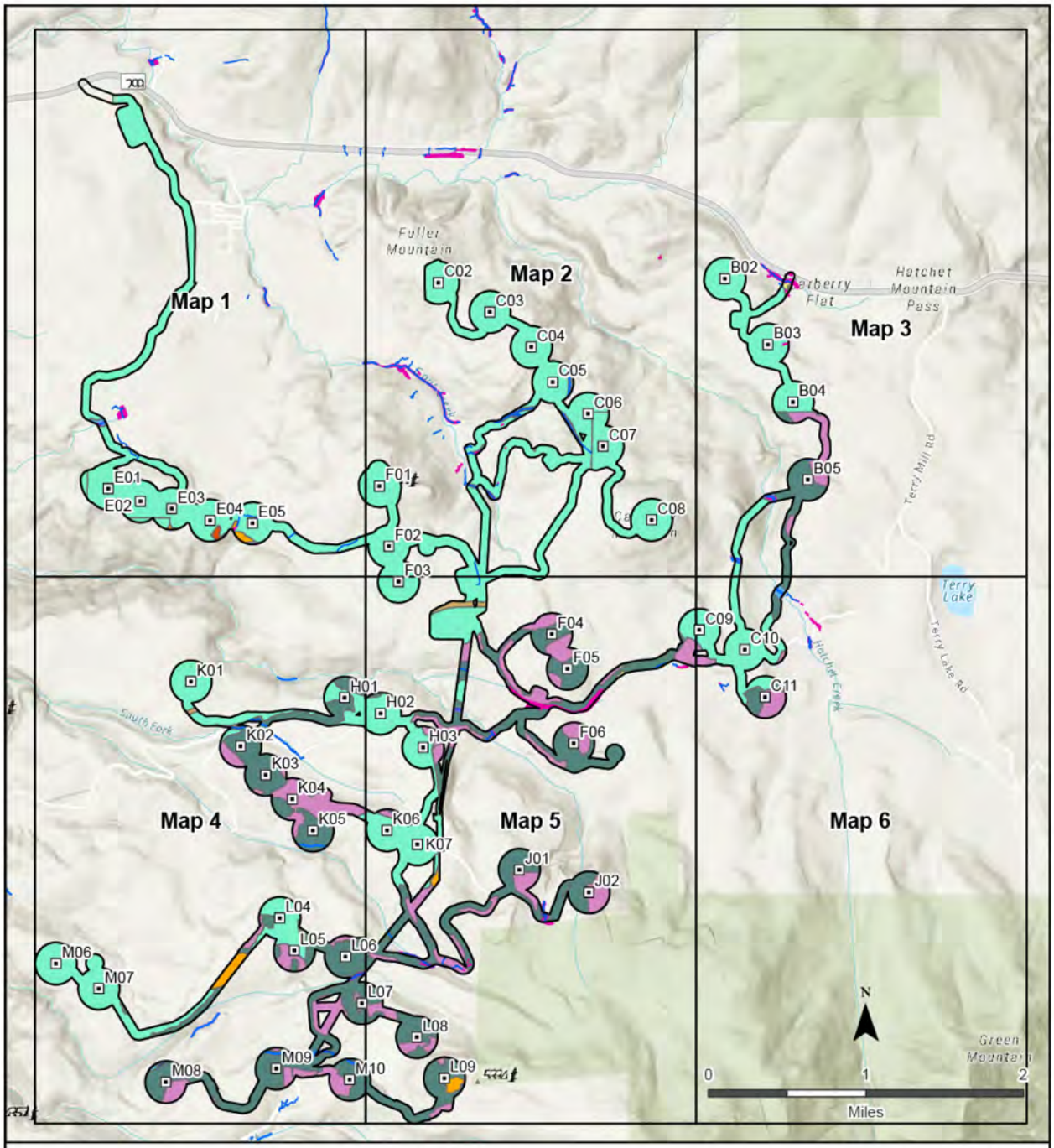


Figure 5.2-1a
Vegetation, Landforms, and Drainages

Source: Applicant Data 2024

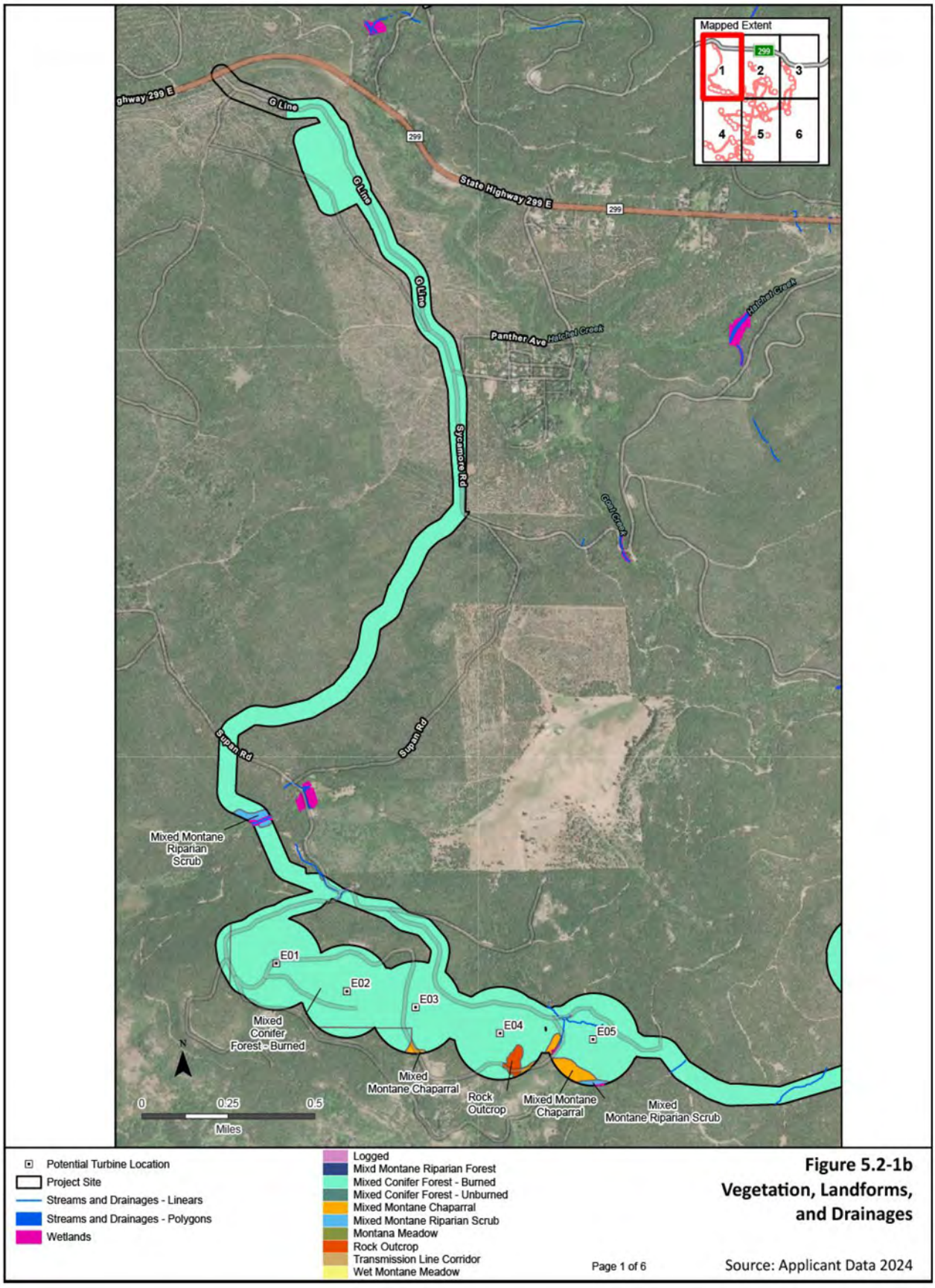


Figure 5.2-1b
Vegetation, Landforms, and Drainages

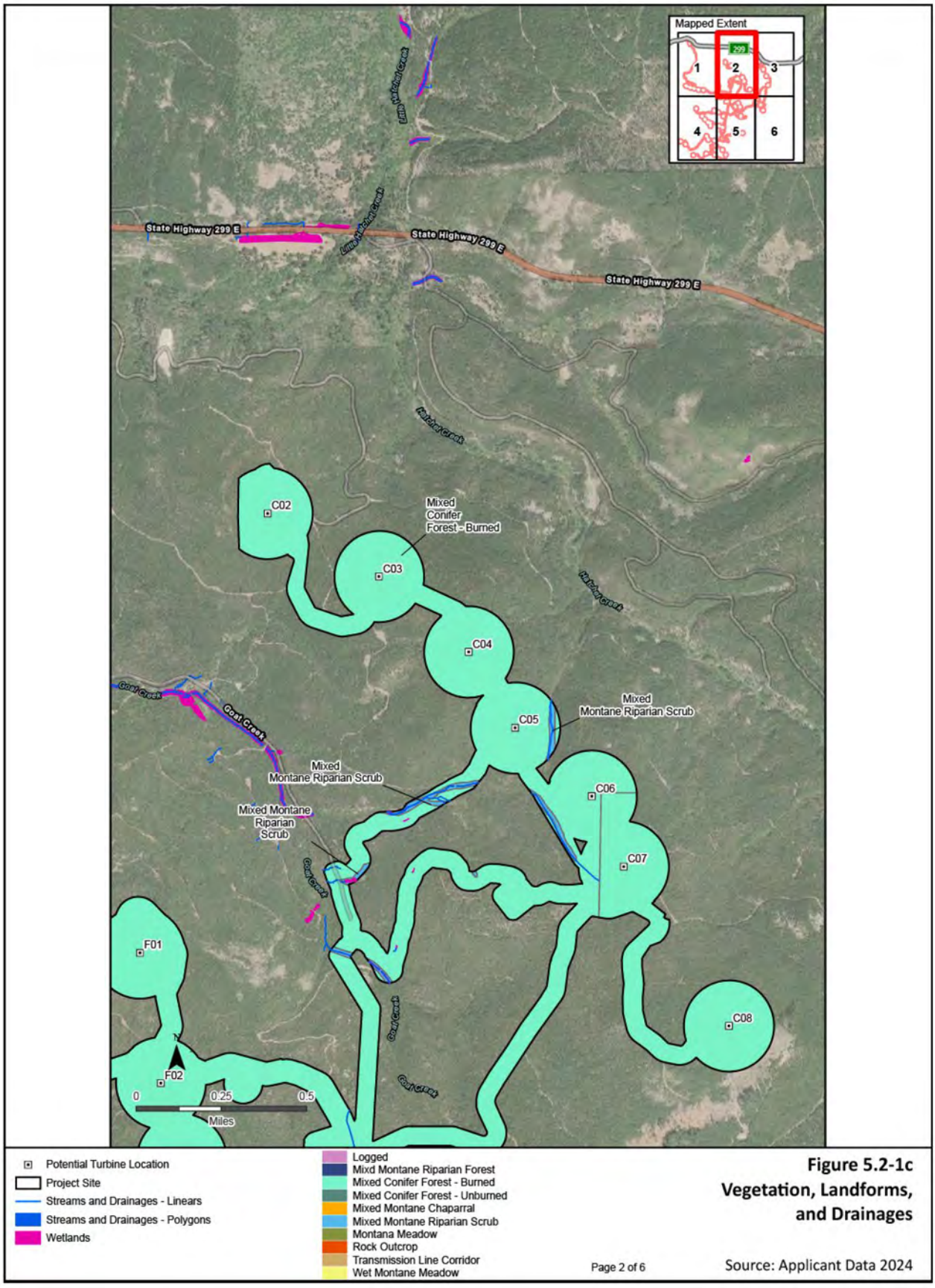


Figure 5.2-1c
Vegetation, Landforms, and Drainages

Source: Applicant Data 2024

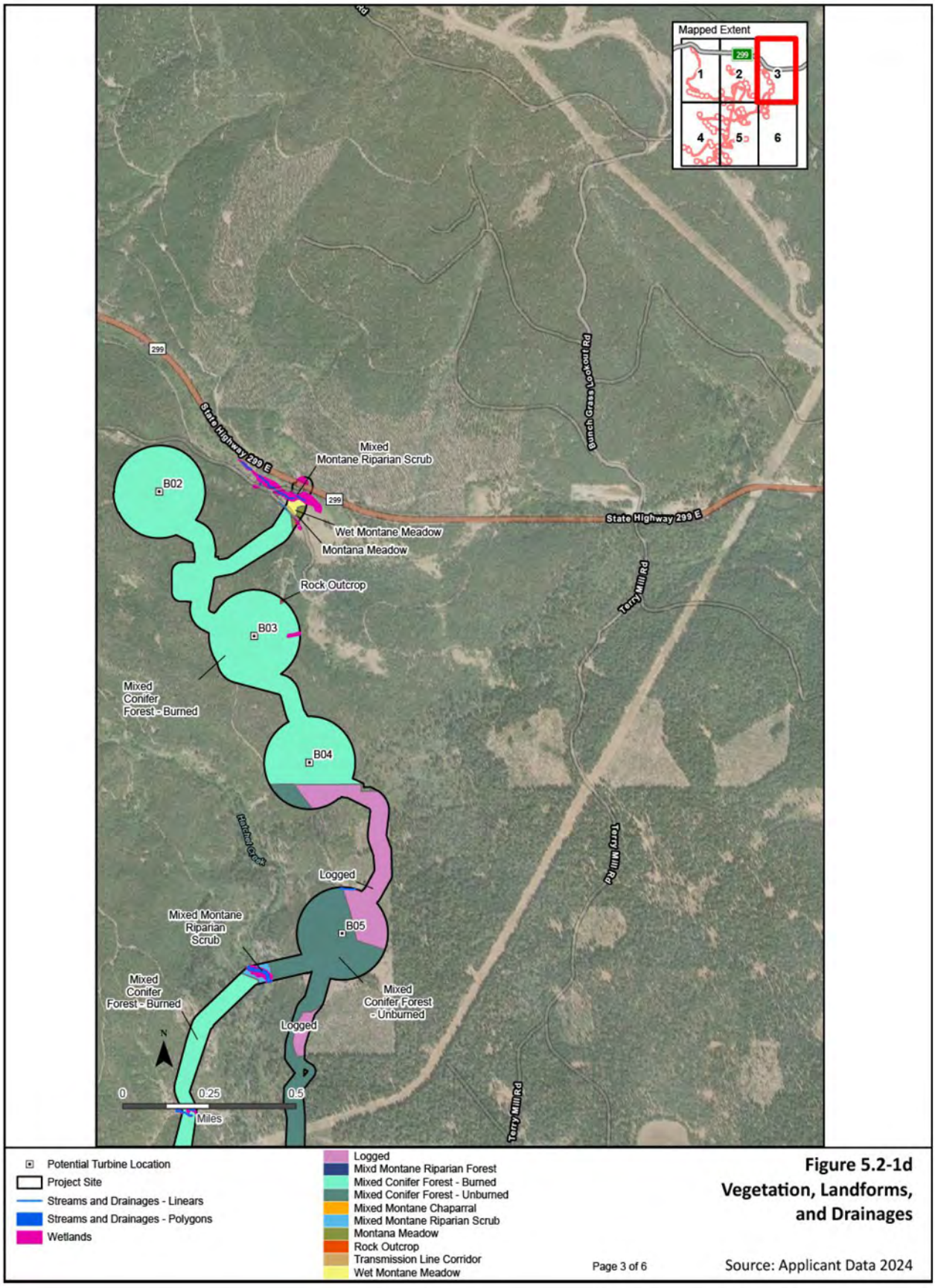


Figure 5.2-1d
Vegetation, Landforms, and Drainages

Source: Applicant Data 2024

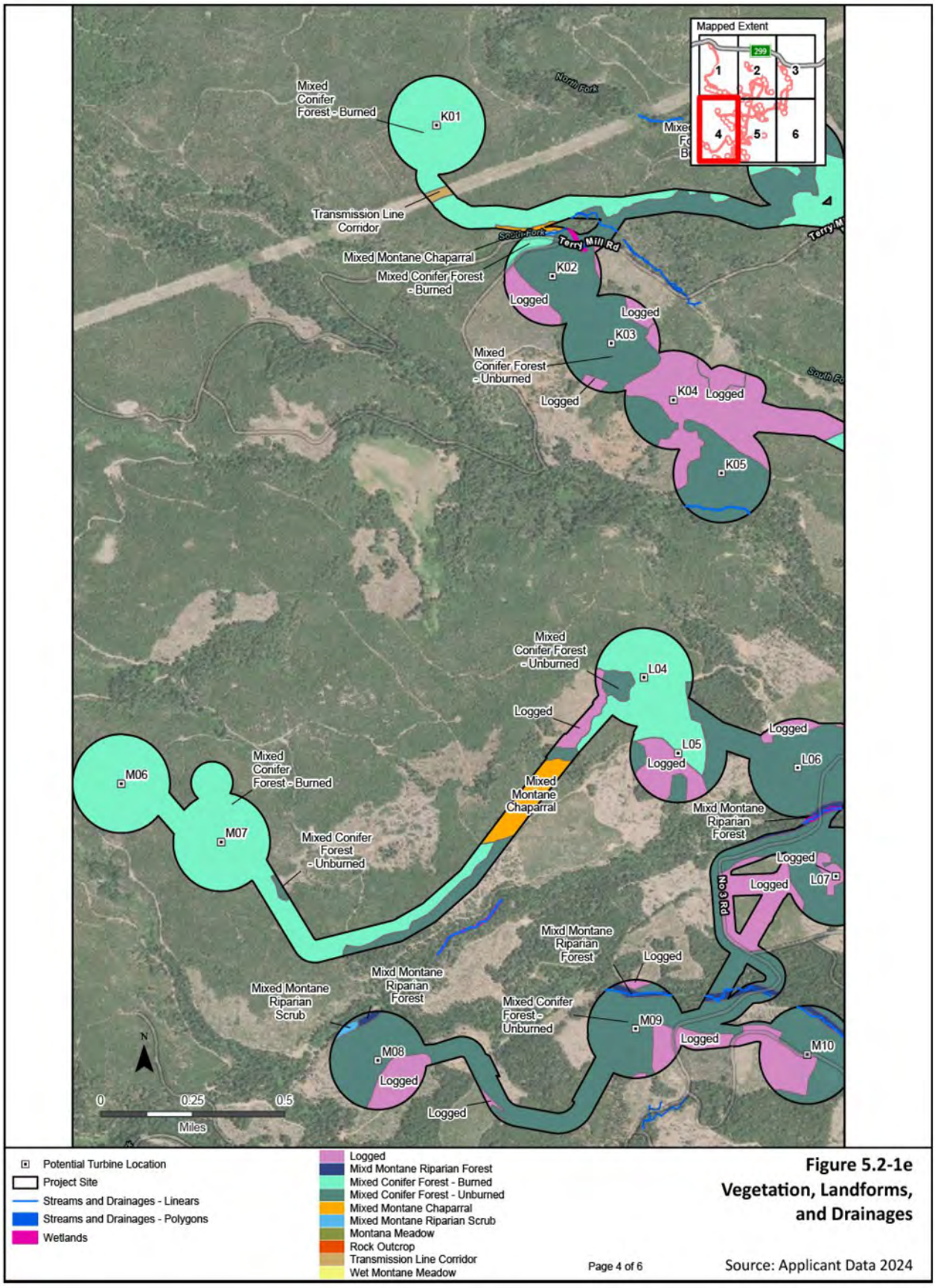


Figure 5.2-1e
Vegetation, Landforms, and Drainages

Page 4 of 6

Source: Applicant Data 2024

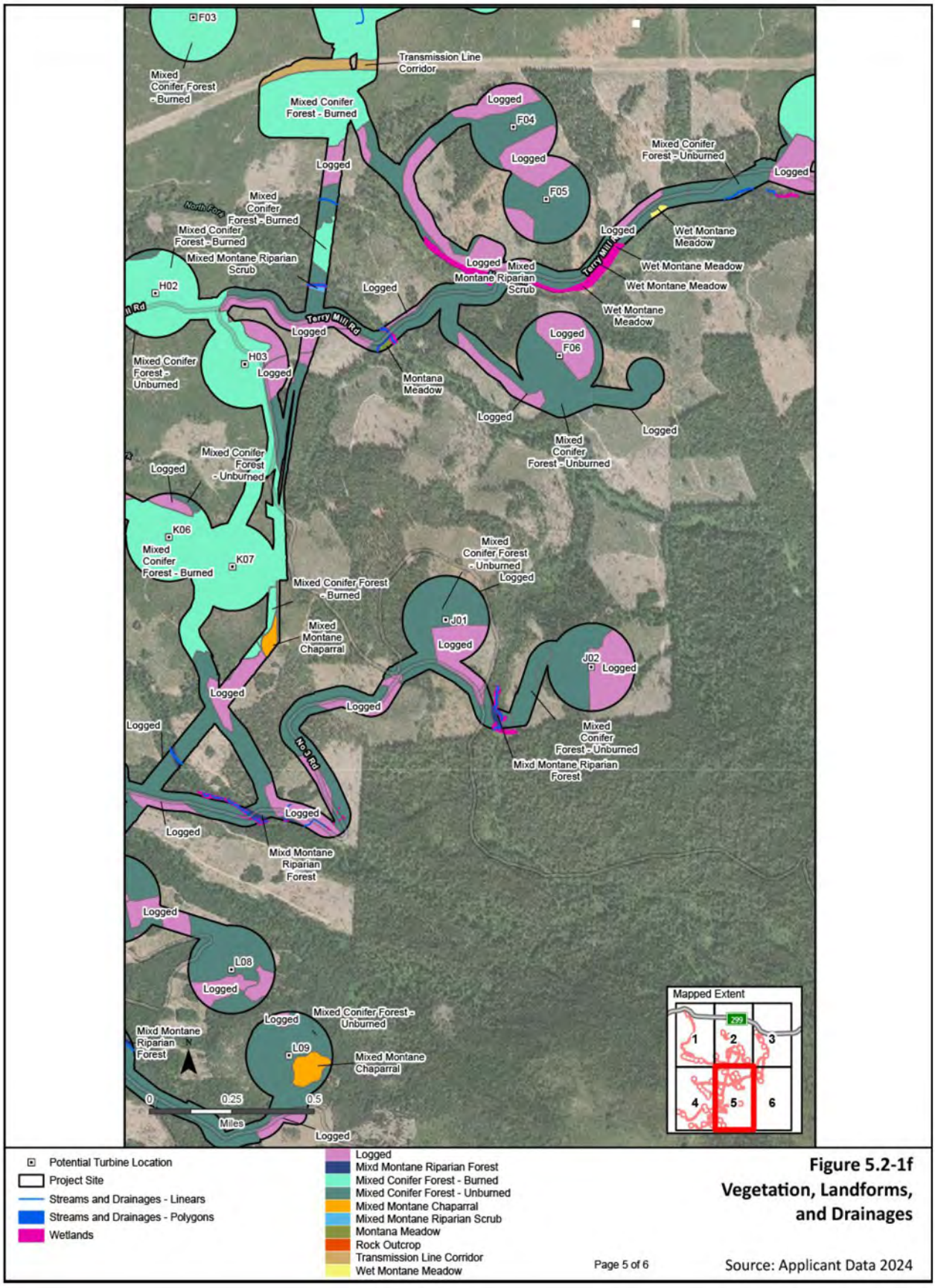
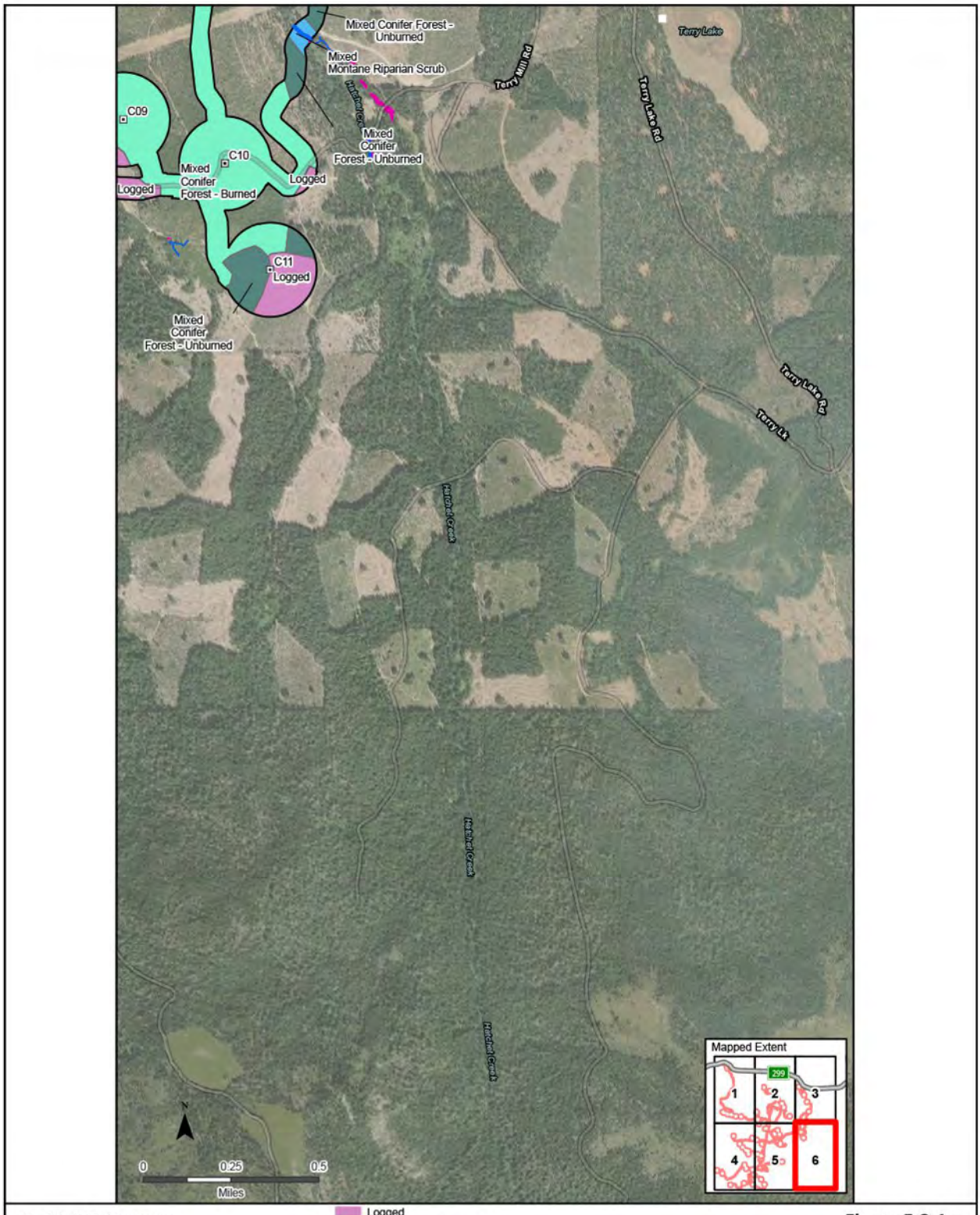


Figure 5.2-1f
Vegetation, Landforms, and Drainages

Page 5 of 6

Source: Applicant Data 2024



Potential Turbine Location
Project Site
Streams and Drainages - Linears
Streams and Drainages - Polygons
Wetlands

Logged
Mixd Montane Riparian Forest
Mixed Conifer Forest - Burned
Mixed Conifer Forest - Unburned
Mixed Montane Chaparral
Mixed Montane Riparian Scrub
Montana Meadow
Rock Outcrop
Transmission Line Corridor
Wet Montane Meadow

Figure 5.2-1g
Vegetation, Landforms, and Drainages

Page 6 of 6

Source: Applicant Data 2024

Vegetation Mapping

Vegetation mapping has been conducted several times during the development history of this project. Vegetation was initially mapped by Western Ecosystems Technology, Inc. (WEST) using the USGS National Land Cover Dataset (FWPA, TN 248308-7; FWPA, TN 248308-8). In the spring and summer of 2018 and 2019 WEST mapped dominant plants within each vegetation community and communities were classified in accordance with the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986) or A Manual of California Vegetation (2nd Edition, Sawyer et al. 2009). Based on the field data collected during rare plant surveys, natural vegetation communities were hand-drawn on aerial imagery-based field maps at a scale appropriate for broad-scale mapping (i.e., 1 in = 1,000 feet [2.5 cm = 304.8 m]). The field maps were later digitized in GIS to incorporate into other GIS mapping efforts (FWPA, TN 248308-7; FWPA, TN 248308-8).

Stantec biologists classified vegetation communities during the aquatic resources survey based on descriptions provided in A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988).

For the purposes of this analysis staff is using the latest vegetation maps provided by the Applicant. Staff recognizes there are limitations and challenges when mapping large areas using aerial imagery. Mapping vegetation communities over a large area and over a long period of time has inherent limitations. Vegetation communities overlap in most characteristics and, over time, will shift from one community type to another. Natural and anthropogenic processes, such as fire, flooding, or logging may result in type conversion of habitats either immediately, in cases of large destructive fires or timber harvest activities, or over a progressive period of time as habitats begin to recover. In addition, all vegetation maps and descriptions are subject to imprecision resulting from several sources, including:

- Vegetation types tend to intergrade on the landscape, without precise boundaries among them. Even distinct boundaries caused by fire or flood can be disguised after years of post-disturbance succession. Mapped boundaries represent best professional judgment, but usually should not be interpreted as literal delineations among sharply defined vegetation types.
- Natural vegetation tends to exist in general recognizable types, but also may vary over time and geographic region. Written descriptions cannot reflect all local or regional variation. Many (perhaps most) stands of natural vegetation do not strictly fit into any named type. Therefore, a mapped unit is given the best name available in the classification, but this name does not imply that the vegetation unambiguously matches written descriptions.
- Vegetation tends to be patchy. Small patches of one named type are often included within larger stands mapped as units of another type. In heavily timbered areas, which is common on the Fountain Wind project site, dense forest stands often mask smaller plant associations or other vegetation types that are not easily observed from aerial imagery alone. Similarly, smaller units of riparian vegetation are

subsumed within larger conifer woodlands. Photo interpretation of some types may be difficult, and accuracy of a vegetation map will vary depending on ground-truthing efforts.

TABLE 5.2-2 VEGETATION AND LAND COVERY TYPES

Vegetation or Land Cover Type	Conversion to Shaded Fuel Break*	Temp Disturbance (Acres)	Permanent Disturbance (Acres)
Riparian Vegetation			
Mixed Montane Riparian Forest	3.1	2.4	4.4
Mixed Montane Riparian Scrub	4.7	4.2	2.6
Montane Meadow	0.56	0.25	0.03
Wet Montane Meadow	1.6	0.92	0.4
Upland Vegetation			
Mixed Conifer Forest Burned	358.8	311.1	288.5
Mixed Conifer Forest Un-Burned	182.3	146.2	140.8
Mixed Montane Chaparral	3.7	4.1	3.9
Other Landform Type			
Rock Outcropping	0.004	0.11	0.03
Logged	92.6	69.2	75.0
Transmission Line Right of Way	1.1	1.4	1.2

*Riparian communities, except for wet meadows where vegetation will be allowed to grow back, that are converted to shaded or managed fuel breaks are treated as permanent impacts.

Vegetation communities were categorized to the alliance level consistent with A Manual of California Vegetation, 2nd Edition (MCV) (Sawyer et al., 2009) and updated in the current online edition (CNPS, 2019) (see **Figure 5.2-1a through 5.2-1g**): Vegetation and Cover Types in Project Area (FWPA, TN 248288-6). Descriptions of the natural vegetation communities are presented below with the Forest Alliance (FA) name followed by the more general habitat description.

Upland Vegetation Communities

Upland vegetation within the project area ranges from conifer woodlands and chapparal to non-native annual grasslands. Upland vegetation is strongly influenced by abiotic factors such as slope, aspect, elevation, and soil type. Other factors such as fire frequency, fire intensity, logging history, and other anthropogenic features (e.g., highways, logging roads, and old quarries), are also important factors in the distribution, density, composition, and level of invasion of non-native plants in upland vegetation communities. Descriptions of upland vegetation types identified within the project area are described below.

Ponderosa Pine Forest FA (Mixed Conifer Forest Un-Burned). This is the dominant vegetation community in the project site. Mixed conifer forest is characterized by a mixed canopy of Ponderosa pine, Douglas-fir, incense cedar, sugar pine, and other

conifers. Madrone, oaks, and other broadleaved trees may be present but in low numbers. California yew (*Taxus brevifolia*), big leaf maple, dogwoods, beaked hazelnut, thimble berry, and other mesic species may also be present in canyon bottoms and near seeps.

Ponderosa Pine Forest FA (Mixed Conifer Forest Burned). This community burned in the 1992 Fountain Fire and is the dominant vegetation community in the project area. Mixed conifer forest is characterized by a mixed canopy of Ponderosa pine, Douglas-fir, incense cedar, sugar pine, and other conifers. Madrone, oaks, and other broadleaved trees may be present but in low numbers. California yew, big leaf maple, dogwoods, beaked hazelnut, thimble berry, and other mesic species may also be present in canyon bottoms and near seeps.

Ponderosa pine is the dominant overstory species in the mixed conifer forest of even-aged trees (approximately 25 years old). The understory shrub and herbaceous vegetation is variable in species composition and cover. The most common species noted include mahala mat (*Ceanothus prostratus*), green leaf manzanita (*Arctostaphylos patula*), bracken fern (*Pteridium aquilinum*), and native squirrel tail grass (*Elymus elymoides*).

Ponderosa Pine Forest FA – Recently Logged (Logged/Recently Logged). Ponderosa pine forest is dominated by dense stands of ponderosa pine. Other tree species such as gray pine, Douglas-fir, incense cedar, white fir, and oaks may be present but in lower numbers. This community was logged within the past 10 to 15 years and replanted with saplings and seedlings of ponderosa and white fir. Small remnant patches of mature trees also remain. Because of the previous logging, the understory in this community is sparse and dominated by invasive herbaceous species including mullein (*Verbascum thapsus*), bull thistle (*Cirsium vulgare*), common St. John's wort or Klamath weed (*Hypericum perforatum*), and houndstongue (*Cynoglossum officinale*).

White Fir – Douglas Fir Forest FA (Mixed Conifer Forest – Burned). This community is characterized by mature, even-aged, mixed conifer species, including white fir, Douglas fir, sugar pine, ponderosa pine, incense cedar and red fir (*Abies magnifica*). It was found in a mosaic in historically and recently logged areas and those areas not burned by the Fountain Fire. The understory is typically very sparse because of the dense canopy that inhibits growth on the forest floor. Patches of more mesic vegetation are also present along canyon bottoms and intermittent streams and are dominated by beaked hazelnut, dogwoods, and blackberries. Forest openings often contain California black oak.

Green Leaf Manzanita Chaparral SA (Mixed Montane Chaparral). This community is characterized by co-dominant evergreen species including bush chinquapin (*Chrysolepis sempervirens*), mountain whitethorn (*Ceanothus cordulatus*), and deerbrush (*C. integerrimus*). Montane chaparral is denser and more impenetrable compared to mixed chaparral. Green Manzanita Chaparral was found interspersed with

most other vegetation communities in the project area, including rocky ridges and slopes, forest openings, recently burned and recently logged areas. It was also found in vegetation management areas including the existing transmission line corridor where vegetation is managed by the utility. This dense vegetation type supports a sparse herbaceous understory.

Riparian Vegetation Communities

Riparian and wetland vegetation in the project area is diverse and varies from sparse mesic meadows to dense riparian thickets. The larger and more diverse swaths of riparian vegetation are found along the perennial drainages some of which include Little Hatchet Creek, Hatchet Creek, Cedar Creek, North Fork Little Cow Creek, North Fork Little Cow Creek, and the South Fork Montgomery Creek. These larger strands of riparian vegetation are dominated by shrubs, including arroyo willow (*Salix lasiolepis*), Pacific willow (*S. lasiandra*), Scouler's willow (*S. scouleriana*), vine maple (*Acer circinatum*), and mountain alder (*Alnus incana*). Some of the larger streams also support tree species, including white alder (*A. rhombifolia*), Oregon ash (*Fraxinus latifolia*), and big-leaf maple (*A. macrophyllum*).

There are numerous smaller streams in the project area that support very narrow strips of riparian vegetation that include species such as white alder, big leaf maple, dogwoods (*Cornus* spp.), beaked hazelnut (*Corylus cornuta*), and blackberries (*Rubus* spp.). Riparian and wetland vegetation types identified within the project area are described in the following paragraphs.

Rocky Mountain Maple Provisional Shrubland Alliance (SA) (Mixed Montane Riparian Scrub/Mixed Montane Riparian Forest). These riparian communities are dominated by stands of rocky mountain maple and is located along ephemeral, intermittent and perennial streams, and drainages throughout the project area. In the southern portion of the project area, it is often found as a codominant with gray alder where it intergrades with Mixed Montane Riparian Forest habitat. The understory vegetation of this community varies depending on access to stream flows and ground water. The southern portions of the project area are generally more mesic (i.e., wetter) and support understories of blackfruit dogwood (*C. sessilis*), twinleaf honeysuckle (*Lonicera involucrata*), and vine maple. Adjacent conifers provide additional canopy cover in this area. Northern portions of the project area are more xeric (i.e., drier), and the understory is dominated by Scouler's willow along streambanks, with green leaf manzanita and ceanothus occurring in drier areas. These drier riparian areas in the north of the project site are considered Mixed Montane Riparian Scrub habitat.

Beaked Sedge Meadows Herbaceous Alliance (HA) (Wet Montane Meadow). This community was mapped within seasonally or permanently saturated emergent wetland areas adjacent to streams and ponds in higher elevation areas of the project area. They also occur as openings on seepy hillsides surrounded by Sierran mixed conifer or ponderosa pine forest, interspersed with montane riparian vegetation. These meadows are dominated by a high diversity of grass, sedge, rush, and forb species,

which include beaked sedge (*Carex utriculata*), bluejoint reedgrass (*Calamagrostis canadensis*), marsh foxtail (*Alopecurus geniculatus*), Nebraska sedge (*C. nebrascensis*), brown sedge (*C. subfusca*), and sword leaved rush (*Juncus ensifolius*).

Other species detected in these communities included including big-leaf sedge , spearmint (*Mentha spicata*), tundra aster (*Oreostemma alpigenum*), western mountain aster (*Symphyotrichum spathulatum*), white-flowered bog-orchid (*Platanthera dilatata*), giant checkerbloom (*Sidalcea gigantea*), narrow leaved lotus (*Hosackia oblongifolia*), three petaled bedstraw (*Galium trifidum*), pull-up muhly (*Muhlenbergia filiformis*), seep monkey flower (*Mimulus guttatus*), and cultivated timothy (*Phleum pratense*) (FWPA, TN 248329-4). Scattered shrubs occur in some of these wet meadows.

Bentgrass – Tall Fescue Herbaceous Semi-Natural Alliance (Montane Meadow). The Bentgrass – Tall Fescue Herbaceous Semi-Natural Alliance meadows are found in forest openings and sometimes adjacent to beaked sedge wet meadows. As a semi-natural alliance, these montane meadows are non-native species dominant. Dominant plants include non-natives creeping bentgrass (*Agrostis stolonifera*), tall fescue (*Festuca arundinacea*), and the native species common yarrow (*Achillea millefolium*), and goldenrod (*Solidago* sp.) (FWPA, TN 248288-6).

Perennial grasslands occur around Carberry Flat. The herbaceous layer is dominant and includes meadow foxtail (*Alopecurus pratensis*), Kentucky blue grass (*Poa pratensis*), blue wild rye (*Elymus glaucus*), common velvet grass (*Holcus lanatus*), gumweed (*Grindelia* sp.), sticky cinquefoil (*Drymocallis glandulosa*), and common yarrow.

Other Cover Types and Landforms

Other vegetation and non-vegetated land cover types are also present in the project area. These include roads, open water, rock outcroppings, and other cover types.

Rock Outcrop. Rock outcrops are not a vegetation type, but they are important habitat for a variety of plants and wildlife. Vegetation is often absent or sparse and dominated by species capable of growing on rock outcrops such as stonecrop (*Sedum* spp.), alumroot (*Heuchera* spp.), and various ferns. Rock formations occur at several locations throughout the project area. Rock outcrops do not clearly match any vegetation types described in A Manual of California Vegetation (Sawyer et al., 2009).

Barren. Although not mapped by the Applicant barren habitat is characterized as dirt and paved roads and their associated road shoulders. Vegetation is usually not present, although sparse cover of grasses and forbs or weedy species occasionally occurs in these areas depending on the amount of road use that has occurred. These areas include the numerous earthen roads that provide access for logging and the existing transmission line corridor. An historic quarry site is also present in the project area.

Open Water. Although not mapped by the Applicant, this land cover type is used to describe aquatic features that are defined by open water and do not support vegetation. These features may include small impoundments (i.e., man-made ponds),

lakes, ponds, and rivers. In the project area open water is limited to the larger perennial streams.

Non-Native Invasive / Noxious Weeds

Invasive or noxious weeds are plants that can directly or indirectly cause problems for agriculture, natural resources, wildlife, recreation, navigation, public health, or the environment. The California Department of Food and Agriculture (CDFA) (CDFA, 2024) and the California Invasive Plant Council (Cal-IPC) (Cal-IPC, 2024) have rated invasive or noxious weeds in California based on the threat these species pose to the natural landscape. The Forest Service has also placed a high priority on the management of invasive or noxious weeds, which includes reducing management-related introduction and spread of invasive or noxious weeds on the forest (USFS, 2001). Although the project is located on private lands it is located immediately north of the LNF and south of the STNF. The USFS tracks weeds that are present or have a potential to become present within the USFS. They assign actions to these species depending on the risk they pose. These actions range from “surveillance” to “eradication”.

The Applicant conducted surveys for non-native invasive plant species concurrently with rare plant surveys in 2018 and 2019 (FWPA, TN 248308-7; FWPA, TN 248308-8). Roadsides within the project site and a subsample of recently logged areas were the focus of the invasive plant surveys. All invasive plant species designated by the California Invasive Plant Council (CAL-IPC) as High, Moderate or Limited were mapped.

A total of fifteen species of noxious weeds were documented in the project area (FWPA, TN 248318). The most common invasive plant species observed within the project area included mullein (CAL-IPC ranked "limited"), bull thistle (CAL-IPC ranked "moderate"), Klamath weed (CAL-IPC ranked "limited"), and houndstongue (CAL-IPC "moderate"). The Applicant found these four species to be ubiquitous and widespread within all logged and recently logged areas.

Three invasive plant species ranked "high" by Cal-IPC were also observed in the project area and included Himalayan blackberry (*Rubus armeniacus*), yellow starthistle (*Centaurea solstitialis*), and medusahead (*Elymus caput-medusae*). Additional Cal-IPC ranked invasive plant species observed included annual dog tail grass (*Cynosurus echinatus*; "moderate"), tall fescue (*Festuca arundinacea*; "moderate"), field sorrel (*Rumex acetosela*; "moderate"), orchard grass (*Dactylis glomerata*; "limited"), and English plantain (*Plantago lanceolata*; "limited").

Aquatic Resources

A jurisdictional delineation of the project area was conducted by Stantec Consulting Services Inc. (Stantec) in 2019 (FWPA, TN 248329-4). The delineation included a 700-foot radius centered on turbine locations, a 200- to 400-foot corridor centered on project roads, a 300-foot corridor centered on the electrical collection line, a 200-foot buffer around project facilities, and a 100-foot buffer around staging areas. The survey focused on a delineation of potential Waters of the United States (WOTUS), including

wetlands and riparian areas. During the surveys Stantec identified 206 wetlands and classified them as one of six "wetland types." A total of 52 acres of potential WOTUS were also mapped. These waters included:

- Fresh emergent wetland (1.0 acre)
- Riparian wetland (26.8 acres)
- Seasonal wetland (0.1 acre)
- Vegetated ditch (0.2 acre)
- Wetland meadow (8.7 acres)
- Wetland seep/spring (1.8 acres)
- Ephemeral stream (0.6 acre)
- Intermittent stream (2.9 acres)
- Non-vegetated ditch (0.2 acres)
- Perennial stream (9.5 acres)
- Pond (0.2 acres)

It is not clear to Staff if the survey delineated the boundaries of CDFW jurisdictional habitats or used vegetation as a proxy to define CDFW jurisdictional habitat. In addition, during the one-day reconnaissance level survey conducted by staff in November 2023, staff noted that a variety of vegetated and unvegetated swales, ditches and other features may not have included in the initial delineation completed by Stantec in 2019. It is possible these features were assessed and dismissed however that information was not found in a review of the applicant's technical documents. It was noted that in the Stantec document the survey focused on classifying aquatic habitats following *A Guide to Wildlife Habitats of California*, an older and more general classification system (Mayer and Laudenslayer, 1988).

Designated Critical Habitat and Special Habitat Designations

The Federal Endangered Species Act (FESA) defines critical habitat as specific geographic areas that contain features essential to the conservation of an endangered or threatened species that may require special management and protection. Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery. The USFWS and NMFS publish proposals to designate critical habitat in the Federal Register, a daily publication of the federal government.

Critical Habitat for federally listed species does not occur in the project area. Critical habitat for the northern spotted owl (*Strix occidentalis caurina*), a State and federally threatened species, occurs approximately four miles north of Highway 299, which is the northern terminus of the project area. Critical habitat for slender Orcutt grass (*Orcuttia tenuis*), a Federally Threatened species, is located approximately six miles north of the project site (see **Figure 5.2-2**).

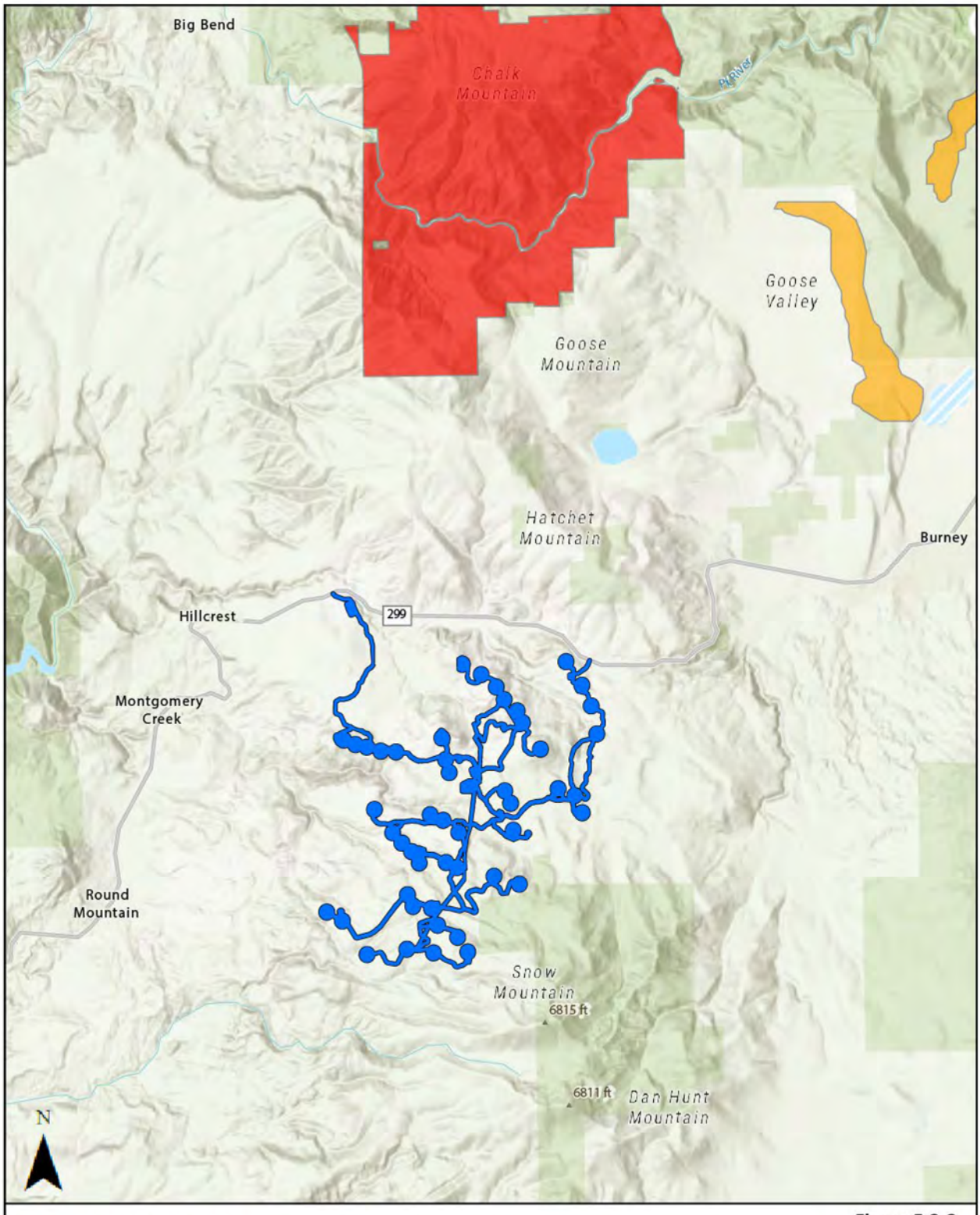


Figure 5.2-2
Critical Habitat Near Project

Source: Applicant Data 2024

Wildlife Corridors, Special Linkages, and Important Bird Areas

Movement and dispersal corridors that connect large blocks of habitat are essential to the long-term viability of plant and wildlife populations. The California Essential Habitat Connectivity Project (Connectivity Project) was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity to be used for conservation and infrastructure planning (Spencer et al., 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (Natural Landscape Blocks) and areas essential for ecological connectivity between them (Essential Connectivity Areas). Another goal of the Connectivity Project was to highlight streams and rivers that provide additional routes for terrestrial and aquatic connectivity between Natural Landscape Blocks and Essential Connectivity Areas, referred to as Potential Riparian Connections (Spencer et al., 2010). These maps do not reflect the needs of particular species but are based on overall biological connectivity and ecological integrity.

The project area is not located in areas identified as contiguous Natural Landscape Blocks (Spencer et al., 2010; Gould, 2020). Most of the project area consists of highly fragmented managed timber lands. The Natural Landscape Blocks that are closest to the project area are located north of the site in the STNF and east toward Hat Creek which provides relatively large continuous habitat to areas well south of the site. Nonetheless, the project area provides large open tracks of timber land and numerous creeks, drainages and streams which would be expected to support the movement of species on a local scale. The project area would also be expected to support use by seasonal migrants.

Various ungulates (deer and elk) and many mammalian predators (stoats to black bears) would be expected to occur in this area to access foraging and breeding opportunities. Mammals commonly detected or expected to occur in the project area include black-tailed deer (*Odocoileus hemionus*), elk (*Cervus canadensis roosevelti*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), and striped skunk (*Mephitis mephitis*) (iNaturalist, 2024).

The project site includes Columbian black-tailed deer fawning habitat, according to CDFW (2020). The Columbian black-tailed deer, one of six subspecies of black-tailed deer in California, is recognized by black-tipped tail and large, pointy ears. Fawns are usually born in late spring/early summer in dense forests and shrublands, including riparian and mountain habitats, with abundant forage and water nearby. Deer fawning habitat is present within the project site and this species is expected to occur.

The project site is located within the Pacific Flyway and hundreds of species of birds are known to migrate through the region. The Pacific Flyway is a major north-south flyway for migratory birds and extends from Alaska to Patagonia and spans the western U.S. In addition, many birds including greater sandhill crane (*Antigone canadensis tabida*) are

known to migrate at and near the project area. This species is listed as Threatened by the State of California (see **Figure 5.2-3**).

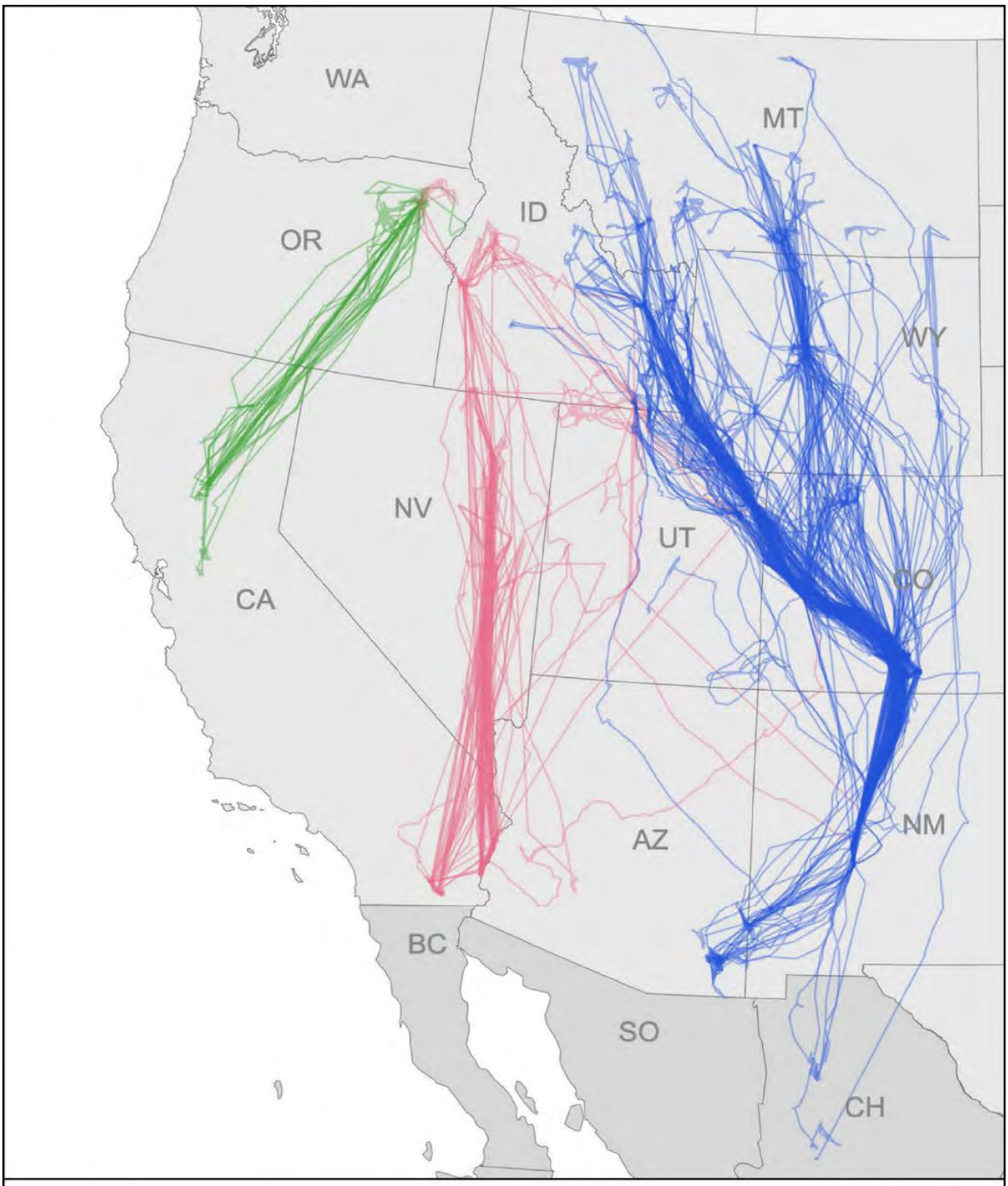


Figure 5.2-3
Sandhill Crane Annual Cycle GPS Locations

Source: Applicant Data 2024

Important Bird Areas. The Audubon Society has identified Important Bird Areas (IBAs) throughout the Western Hemisphere that provide essential habitat for birds (Audubon 2024). These IBAs include sites for breeding, wintering, and migrating birds and can range from only a few acres to thousands of acres in size. The closest IBAs to the project area are the Fall River Valley IBA, located 20 miles (32 km) to the northeast, and the Upper McCloud IBA located 28 miles (45 km) to the north-northwest (FWPA, TN 248318).

The Fall River Valley IBA site supports a high diversity of ducks and shorebirds, including breeding sandhill cranes. (Site Characterization study TN248318) Thousands of ducks and geese over-winter here, and the site provides a staging area for migrating species such as the cackling Canada goose (*Branta hutchinsii*), a rare subspecies. The Pit and Fall rivers support large populations of breeding and wintering bald eagles (*Haliaeetus leucocephalus*), a State fully protected species, and osprey (*Pandion haliaetus*) and the open valley provides important winter foraging habitat for raptors. Swainson's hawks (*Buteo swainsoni*), a State threatened species, long-billed curlews (*Numenius americanus*), burrowing owls (*Athene cunicularia*), black swifts (*Cypseloides niger*), and tricolored blackbirds (*Agelaius tricolor*), a State threatened species, are known to nest in the valley, while bank swallows (*Riparia riparia*), a state threatened species are known to nest along the Pit River. Western burrowing owls have recently been petitioned as a State candidate for listing.

The Upper McCloud River IBA encompasses 835 acres (1.3 mi^2) of extensive riparian and wetland habitat supporting populations of species dependent upon these habitats. The site is notable for a large population of breeding willow flycatchers (*Empidonax traillii*), a state endangered species (Audubon, 2024c).

Common Wildlife

This section describes common wildlife species that were documented during previous studies conducted by the applicant or have the potential to occur in the project area. These include some species that have been designated as "watch list" species by USFS or CDFW or as "special animals" by CDFW. Special-status species are discussed below in **Section 5.2.1.7 (Special-Status Wildlife)**.

Despite a history of commercial logging and wildfires, the project area has the potential to support a variety of common wildlife that use conifer woodlands, riparian, and other upland vegetation. Riparian areas are considered to have the greatest intrinsic value to wildlife species, as they support foraging, breeding, and refugia options to many species. Riparian and wetland vegetation within the project area varies from sparse mesic meadows to narrow, dense riparian forests. Upland communities occur in drier areas and conifer woodlands are the dominant vegetation type in the project area. Upland communities provide foraging, breeding, and refugia habitat for many species. Leaf litter, organic and coarse woody debris, downed wood from salvage operations after the Fountain fire, small natural tree cavities in the remaining larger timber stands,

rock piles, meadows, among others, are all important habitat features for various terrestrial species.

Invertebrates Habitat conditions within the project area provide a suite of microhabitat conditions for a variety of terrestrial and aquatic insects, mollusks, arthropods, crustaceans, and other invertebrates. These microhabitats can be found within distinct areas of the forests, chaparral, or grasslands, or within the various, rivers, creeks, streams, marshes, and springs that occur in the project area. As in all ecological systems, invertebrates play a crucial role in multiple biological processes. They serve as the primary or secondary food source to a variety of fish, amphibian, reptile, bird, and mammal predators; they provide pollination vectors for numerous plant species; they act as efficient components in controlling pest populations; and they support naturally occurring maintenance of an area by consuming detritus and contributing to necessary soil nutrients.

There are numerous invertebrates known from the project area including Anisoptera (dragonflies), Zygoptera (damselflies), Lepidoptera (moths and butterflies), Hymenoptera (wasps, bees, and ants), Orthoptera (grasshoppers, crickets, and katydids), Diptera (flies), Hemiptera (true bugs), Coleoptera (beetles), Hygrophila (aquatic pulmonated mollusks), Stylommatophora (terrestrial gastropod mollusks), and Bivalvia (mussels and clams) (iNaturalist, 2024).

Some of the species identified in the project area through the records search include Northern Checkerspot (*Chlosyne palla*), Pale Swallowtail (*Papilio eurymedon*), Golden Northern Bumble Bee (*Bombus fervidus*), Acmon Blue (*Icaricia acmon*), and Pipevine swallow tail (*Battus philenor*). Button's banana slug (*Ariolimax buttoni*), Milky Slug (*Deroceras reticulatum*), western forest scorpion (*Uroctonus mordax*), yellow-face bumble bee (*Bombus vosnesenskii*), pale western sheep moth (*Hemileuca eglanterina*), California root borer beetle (*Prionus californicus*), and ten-lined June beetle (*Polyphylla decemlineata*) may also occur.

Some of the invertebrates that are known from the region and are designated as "special animals" by CDFW include western pearlshell (*Margaritifera falcata*)-ranked S1S2, Oregon Shoulderband Snail (*Helminthoglypta hertleini*) ranked S1S2, Shasta Sideband (*Monadenia troglodytes*) ranked S2, Church's or Klamath Sideband (*Monadenia churchi*) ranked S3, topaz Juga (*Juga occata*) ranked S2, kneecap Lanx (*Lanx patelloides*) rabnked S2, and Sierra blue butterfly (*Agriades podarce*) which as an S2 designation. There are other invertebrates considered "Special Animals" without formal special status designations that also occur in the region.

Fishes and Amphibians. Aquatic and riparian habitat is common in the region and within the many small creeks, streams, and wet meadows that are present in the project area. The Aquatic Resource Survey (FWPA, TN 248329-4) mapped 109 perennial stream segments with widths ranging from 2 to 90 feet. In addition, there are numerous intermittent drainages present on the site. Some of the perennial features support habitat conditions such as fast-moving waters, narrow runs, deep pools,

shallow pools with dense vegetative cover, steep banks, and sections with short runs and riffles. Many of these aquatic resources also support a range of substrate conditions from silty sands, gravel, and cobble, to shallow ponded areas in meadows and seeps. Although not all aquatic resources support standing water year-round, many pools and streams are fed by snowmelt and support water seasonally.

Data from the applicant indicated that in addition to native fishes such as the Sacramento pikeminnow (*Ptychocheilus grandis*) and the special-status Pit roach, the streams may contain invasive species such as green sunfish (*Lepomis cyanellus*) and spotted bass (*Micropterus punctulatus*) (FWPA, TN 248288-6).

Frogs, toads, newts, and salamanders may also occur. Each of these species requires a source of standing or flowing water to complete their life cycle. For many species, breeding takes place in aquatic habitats such as rivers, streams, creeks, and pools. Generally, the larval and juvenile stages occur within the same aquatic habitat. Although some amphibious species may remain within or adjacent to standing or flowing water for their entire lives, other species spend significant portions of their adult lives in upland habitats surrounding aquatic breeding sites. Some of these species may also undertake long dispersal journeys to find new breeding sites. During the non-breeding season, amphibians in upland habitats will take refuge in underground burrows, under logs, rock piles, or within leaf litter. Conditions within the project area provide year-round habitat for a variety of amphibians, especially along the larger creeks. Perennial and intermittent creeks, springs, and meadow pools found within the project area may also provide temporary breeding habitat for these species.

The Applicant noted that several common amphibians may be present in the project area including ensatina (*Ensatina eschscholtzii*), rough-skinned newt (*Taricha granulose*), western toad (*Anaxyrus boreas*), Pacific tree frog (*Pseudacris regilla*), and bullfrog (*Lithobates catesbeianus*) (FWPA, TN 248288-6). In addition, other potential amphibians known from the region could be present including Sierran tree frog (*Pseudacris sierra*), Sierra Newt (*Taricha sierrae*), and long-toed salamander (*Ambystoma macrodactylum*) (iNaturalist, 2024).

Reptiles. The number and type of reptiles that occur at a given site is related to several biotic and abiotic features. These include the diversity of plant communities, substrate, soil type, and presence of refugia such as rock piles, boulders, and native debris. These are crucial factors to support the survival and reproduction of various reptile species.

Most reptiles, even if present in an area, are difficult to detect because they are cryptic, and various life history characteristics (i.e., foraging, and thermoregulatory behavior) limit their ability to be observed during most surveys. Many species are active only within relatively narrow thermal limits, avoiding hot and cold conditions, and most take refuge in microhabitats that are not directly visible to the casual observer, such as rodent burrows, crevices, under rocks and boards, and in dense vegetation where they are protected from unsuitable environmental conditions and predators. In some cases,

they are observed when flushed from their refugia. Although most reptile species are found in various upland habitats, there are many other aquatic and semi-aquatic reptiles that can be found within and adjacent to lakes, rivers, streams, creeks, and pools. These species may also be found in upland habitats when hibernating, seeking foraging opportunities, or dispersing to another aquatic habitat.

The Applicant indicated the mixed conifer, scrub and chaparral areas are suitable for reptiles such as western fence lizard (*Sceloporus occidentalis*), sagebrush lizard (*Sceloporus graciosus*), western skink (*Eumeces skiltonianus*), western whiptail (*Cnemidophorus tigris*), northern alligator lizard (*Gerhonotus coeruleus*), rubber boa (*Charina bottae*), sharp-tailed snake (*Contia tenuis*), gopher snake (*Pituophis melanoleucus*), common kingsnake (*Lampropeltis getulus*), western terrestrial garter snake (*Thamnophis elegans*), and western rattlesnake (*Crotalus viridis*) (FWPA, TN 248288-6).

Other species that have been documented in the region include Mountain garter snake (*Thamnophis elegans* ssp. *elegans*), Western Yellow-bellied Racer (*Coluber constrictor* ssp. *Mormon*), northern Pacific rattlesnake (*Crotalus oreganus oreganus*), Skilton's skink (*Plestiodon skiltonianus skiltonianus*), western skink (*Plestiodon skiltonianus*), western sagebrush lizard (*Sceloporus graciosus gracilis*), and northwestern fence lizard (*Sceloporus occidentalis occidentalis*) (iNaturalist, 2024).

Mammals. The distribution of mammals in the project area is associated with the presence of perennial water, vegetation communities, and topographical and structural components (i.e., rock piles, downed logs felled after the Fountain fire, soil type, stream terraces, and the steepness of terrain) that provide refugia and opportunities for foraging and the presence of suitable soils for fossorial mammals (i.e., loose dirt or sandy areas along riverbanks, lakes, and meadows). While some managed forests do not support the same species abundance versus older later seral forests, the project area provides ample habitat for several common and sensitive mammals.

Riparian features in the project area, such as freshwater marshes, montane wet meadows, and drainages, provide breeding and foraging habitat for a multitude of mammals. Willows and other stands of trees of varying densities are located along the numerous creeks and streams in the project area and provide cover, foraging habitat, and movement corridors. The montane chaparral, Douglas-fir, and other conifer forests provide habitat to arboreal and fossorial species. Open meadows and grasslands provide essential foraging habitat for the ungulate species found within the region.

A variety of small mammals have the potential to occur in the project area. These include western gray squirrel (Sciurus griseus), long-tailed weasel *(Mustela frenata)*, dusky-footed woodrat *(Neotoma fuscipes)*, western jumping mouse *(Zapus princes)*, montane vole *(Microtus montanus)*, western harvest mouse *(Reithrodontomys montanus)*, and deer mouse *(Peromyscus maniculatus)* (FWPA, TN 248288-6). Other small mammals that may occur in the project area include Douglas squirrel *(Tamiasciurus douglasii)*, golden-mantled ground squirrel *(Spermophilus lateralis)*,

chipmunks *(Tamias* spp.*)*, Botta's pocket gopher *(Thomomys bottae)*, broad-footed mole *(Scapanus latimanus)*, Trowbridge's shrew *(Sorex trowbridgii)*, and black-tailed jackrabbit *(Lepus californicus)* (iNaturalist, 2024).

Additional small mammal species that are common in the region and would be expected to occur include California vole (*Microtus californicus*), house mouse (*Mus musculus*), and northern flying squirrel (*Glaucomys sabrinus*). Small predators such as the stoat, long-tailed weasel (*Mustela frenata*), and American marten (*Martes americana*) are likely to be attracted to the woodland and riparian habitats that are found within the project area and likely occur in the adjacent LNF.

Mid-size mammals including North American porcupine (*Erithrozion dorsatum*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), striped skunk, and raccoon (*Procyon lotor*) are likely present in the project area. Bobcat and coyote (*Canis latrans*) are also expected to occur.

Habitat for large mammals including black bear, Roosevelt elk, and mountain lion is known from the project area. Open meadows, riparian areas, and forest edges provide suitable foraging and sheltering habitat for mule deer fawning (FWPA, TN 248288-6).

Bats are also known from forested areas and the Applicant indicated the project area has ample forest that could provide roosting habitat for bats and wetland and riparian habitat that may be important foraging habitat. Bat species including California myotis (*Myotis californicus*), small-footed myotis (*Myotis ciliolabrum*), little brown bat (*Myotis lucifugus*), silver-haired bat (*Lasionycteris noctivagans*), and hoary bat (*Lasiurus cinereus*) have the potential to occur within the project site (FWPA, TN 248288-6). Silver-haired bat, along with little brown myotis, long-legged myotis, and big brown bat are designated as "special animals" by CDFW. Other bats known from the region include Mexican free-tailed bat (*Tadarida brasiliensis*) and Long-eared Myotis (*Myotis evotis*). In addition, migrant bats such as the western red bat (*Lasiurus blossevilli*) and hoary bat may occur in riparian areas in the spring and early fall. The body of a western red bat was detected on Shasta Dam Road in January of 2023 (iNaturalist, 2024). Bats are likely to forage over most of the project area along riparian corridors and meadows where they prey on small insects, moths, and other invertebrates.

Birds. The diversity of birds in the project area is a function of the many lakes, rivers, and plant communities in the broader region, and the localized conifer woodland habitat that provide habitat for different groups of birds. The project site is located within the Pacific Flyway and hundreds of species of birds are known to migrate through the region. From the results of two years of avian point count studies conducted within the project area, the site contains some stopover habitat for migratory birds including raptors and songbirds but has limited habitat for waterfowl or waterbirds (FWPA, TN 248309-5). In addition, to the avian use studies the Applicant conducted numerous other surveys including eagle nest surveys, a nocturnal migrant risk assessment, protocol surveys for California spotted owl surveys, among others. See **Table 5.2-1**

(Summary of Surveys Conducted at the project site) for a summary of the report findings and a complete list of the Avian Studies completed for the project.

Songbirds. Two years of small bird surveys were conducted in the project area. During the surveys the Applicant 71 different species during the first year and 50 species during the second year (FWPA, TN 248309-5). The most abundant birds observed during these surveys included dark-eyed junco (*Junco hyemalis*), mountain chickadee (*Poecile gambeli*), western bluebird (*Sialia mexicana*) and Steller's jay (*Cyanocitta stelleri*). Other songbirds identified by the Applicant included house finch (*Haemorhous mexicanus*), purple finch (*Haemorhous purpureus*), song sparrow (*Melospiza melodia*), lesser goldfinch (*Spinus psaltria*), western tanager (*Piranga ludoviciana*), and Townsend's solitaire (*Myadestes townsendi*). Resident and migratory vireos and warblers including Cassin's vireo (*Vireo cassinii*), Hutton's vireo (*Vireo huttoni*), black-throated gray warbler (*Setophaga nigrescens*), yellow-rumped warbler (*Setophaga coronata*), Wilson's warbler (*Cardellina pusilla*), Nashville warbler (*Leiothlypis ruficapilla*), and a few hermit warblers (*Setophaga occidentalis*) were also observed.

Common flycatchers detected included ash-throated flycatcher (*Myiarchus cinerascens*), black phoebe (*Sayornis nigricans*), dusky flycatcher (*Empidonax oberholseri*), Pacific-slope flycatcher (*Empidonax difficilis*), and blue-gray gnatcatcher (*Polioptila caerulea*). Tree swallow (*Tachycineta bicolor*) and cliff swallow (*Petrochelidon pyrrhonota*) were also observed (TN 248309-5). Wrentit (*Chamaea fasciata*), Bewick's wren (*Thryomanes bewickii*), California quail (*Callipepla californica*), spotted towhee (*Pipilo maculatus*), bushtit (*Psaltriparus minimus*), and black-headed grosbeak (*Pheucticus melanocephalus*) were also observed. Other species noted included brown creeper (*Certhia americana*), oak titmouse (*Baeolophus inornatus*), and numerous, red-breasted nuthatch (*Sitta canadensis*) (FWPA, TN 248309-5). Many of these species are well documented within the project area (iNaturalist, 2024; eBird, 2024).

Woodpeckers were commonly observed and are expected to occur widely across the project area. Some of these included northern flicker (*Colaptes auratus*), pileated woodpecker (*Dryocopus pileatus*), red-breasted sapsucker (*Sphyrapicus ruber*), and downy woodpecker (*Dryobates villosus*).

Other common species included Anna's hummingbird (*Calypte anna*), American crow (*Corvus brachyrhynchos*), which was infrequently noted, while common raven (*Corvus corax*), was frequently observed. California scrub-jay (*Aphelocoma californica*), Stellar's jay *(Cyanocitta stelleri)*, and Brewer's blackbird (*Euphagus cyanocephalus*) were also common throughout upland habitats.

Migratory and Resident Raptors. Fifteen species of diurnal raptors were detected over during two years of surveys conducted by the Applicant (FWPA, TN 248305-1; FWPA, TN 248309-5). These included Cooper's hawk (*Accipiter cooperii*), northern goshawk (*Accipiter atricapillus*), sharp-shinned hawk (*Accipiter striatus*), ferruginous hawk (*Buteo regalis*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), northern harrier (*Circus hudsonius*), red-shouldered hawk (*Buteo lineatus*),

bald eagle, golden eagle (*Aquila chrysaetos*), merlin (*Falco columbarius*), American kestrel (*Falco sparverius*), osprey, prairie falcon (*Falco mexicanus*), and turkey vulture (*Cathartes aura*) (FWPA, TN 248305-1; FWPA, TN 248309-5). The red-tailed hawk had the highest use of any diurnal raptor species during all four seasons. Among other diurnal raptor species, sharp-shinned hawk and Cooper's hawk had relatively high use in fall and spring. Overall, raptor use was higher during migration seasons.

Diurnal raptors that have the potential to occur within the project site include the State Threatened Swainson's hawk, white-tailed kite, and American peregrine falcon (the latter two are state fully protected species). None of these three species was recorded during two years of large bird surveys. The northern harrier, a California SSC, was recorded in both years within the project site. Six other species of raptors on the CDFW watch list that were observed include the Cooper's hawk, ferruginous hawk, merlin, prairie falcon, osprey, and sharp-shinned hawk (FWPA, TN 248305-1; FWPA, TN 248309-5).

Nine owl species have potential to nest within the project site or surrounding area including barn owl (*Tyto alba*), barred owl (*Strix varia*), flammulated owl (*Otus flammeolus*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), northern pygmy owl (*Glaucidium gnoma*), northern saw whet owl (*Aegolius acadicus*), California spotted owl (*Strix occidentalis occidentalis*), and western screech-owl (*Megascops kennicottii*) (FWPA, TN 248305-1; FWPA, TN 248309-5). Additionally, short-eared owl (*Asio flammeus*) may be a permanent resident and breeder regionally, and burrowing owl (*Athene cunicularia*) may be a winter resident regionally, but neither is likely to be found in the forested habitats of the study area. However, these species could occur in more open areas such as the utility ROW, meadows, and cleared areas to a limited degree. Barred owl (*Strix varia*) a species that can displace northern and California spotted owls may also be present.

The California spotted owl was detected during recent surveys conducted in 2023. They were found outside the project area within the LNF.

California condors have not been observed over the project site and have been historically extirpated from much of the range. However, California condor have been released under a partnership with the Yurok tribe, USFWS, and National Park Service at a facility located on the Yurok ancestral territory and the Redwood National Park, which is in the northern portion of the species' historic range. If the reintroduction efforts are successful, there is a possibility that condors could recolonize inland portions of northern California, including the project site, at some point in the future. However, the likelihood of this recolonization is currently unknown (FWPA, TN 248307-1).

Waterfowl. Five species of waterfowl were recorded during two years of surveys within the project site (FWPA, TN 248309-5). Snow goose (*Chen caerulescens*) accounted for most of the use in winter and fall, and greater white-fronted goose (*Anser albifrons*) Other waterfowl species observed during the 2018 and 2019 surveys included the cackling goose (*Branta hutchinsii*), Canada goose (*Branta canadensis*), and

tundra swan (*Cygnus columbianus*). Tundra swans were observed rarely but in large flocks. Waterfowl were observed most frequently during winter and during periods of seasonal migration. Waterbird use of the site by two species, American white pelican (*Pelecanus erythrorhynchos*) and sandhill crane (*Antigone canadensis*) was highest in winter. The American white pelican is a California SSC and sandhill crane is a State listed species. No waterbird use was recorded in the summer. Almost all the waterfowl and waterbird use occurred in the fall and winter indicating that these birds were migrating over the area and neither using migratory stop-over habitats within the project site nor breeding there. However, studies of sandhill cranes identify the project area as an important and routinely travelled migratory pathway (Donnelly 2021) (see **Figure 5.2-3**).

Sensitive Biological Resources

This section provides an overview of sensitive natural communities relative to the project area. It also provides information on special-status plants and animals observed within the project area or with a potential to be present. The specific habitat requirements and the locations of known occurrences of each special-status species were the principal criteria used for inclusion in the lists of special-status species potentially occurring within the project area. For the purposes of this report, special-status species include:

- Listed, proposed for listing, or candidates for listing as threatened or endangered species (including designated or proposed critical habitat) under the Federal Endangered Species Act (FESA)
- Listed, or candidates for listing as threatened or endangered under the California Endangered Species Act (CESA)
- Included within the Northwest Forest Plan (NFP) Survey and Manage (S&M) Standards and Guidelines (REO, 2001)
- Bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA)
- Designated as Fully Protected (FP) by the California Department of Fish and Wildlife (CDFW) (CDFW, 2024a)
- Designated as Species of Special Concern (SSC) by CDFW (CDFW, 2024b)
- Plants assigned a California Rare Plant Rank (CRPR) by the California Native Plant Society (CNPS)
- Plants listed as rare under the California Native Plant Protection Act
- Plants that meet the definition of rare or endangered under the California Environmental Quality Act (CEQA) section 15380 (b) and (d)
- Plants considered special-status species in local or regional plans, policies, or regulations.

Sensitive Natural Communities. Sensitive natural communities have been previously defined by CDFW as "...communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." More recently CDFW stated that sensitive natural communities with state ranks of S1–S3 (S1=critically imperiled; S2=imperiled; S3=vulnerable) should be addressed in the environmental review processes of CEQA and its equivalents (CDFW, 2024c, 2024e).

The Rocky Mountain Maple (*Acer glabrum*) Provisional Shrubland Alliance has a State Rank of S3?. A State Rank with a question mark (?), denotes an inexact rank due to insufficient data samples (CDFW, 2020). Rocky Mountain Maple Provisional Shrubland Alliance covers 107.2 acres or 2.4 percent of the Project Site (**Table 5.2-2** Vegetation and Cover Types in Project Area), and is found in riparian areas along ephemeral, intermittent and perennial stream drainages (FWPA, TN 248329-2). Riparian communities, including the Rocky Mountain Maple Provisional Shrubland Alliance, are also considered sensitive, regardless of State Rank under CEQA because of their rarity and biological importance (FWPA, TN 248288-6).

Based on focused rare plant surveys and natural community vegetation mapping performed by the applicant in 2018 and 2019, sensitive natural communities do not occur on the project site (FWPA, TN 248308-7; FWPA, TN 248308-8). However, Upland Douglas-fir forest has a state rank of S3.1 (CDFW, 2023).

In addition to the CDFW sensitive natural communities, the CNPS also ranks vegetation types described in A Manual of California Vegetation (Sawyer et al., 2009). Some of the vegetation types that may be present and have a state rank of S3 including the following:

- Bigleaf maple forest and woodland
- Red osier thickets
- Oregon ash groves
- Fremont cottonwood forest and woodland
- Black cottonwood forest and woodland

None of these vegetation types were mapped within the project area because a different naming convention was used, and these communities may occur as a component of the larger vegetation mapping effort. Staff has addressed this uncertainty through the use of COCs that will require pre-disturbance mapping and the application of compensatory mitigation should they be present.

Special-Status Plants. Rare plant surveys were conducted in 2018 and 2019 (FWPA, TN 248308-7; FWPA, TN 248308-8). Rare plant surveys covered all proposed development corridors throughout the project site; however, approximately 800 acres of the project site were not surveyed due to modifications to the project site that occurred following the 2019 survey. In 2023 the Applicant conducted spot checks for

rare plants in select locations supporting the best habitat (FWPA, TN 253167). No special-status plants were documented during the rare plant surveys.

State and Federally-Listed Plants. State and or Federally-listed plants are not expected to be present in the project area and were not identified during the surveys conducted by the Applicant. Two federally listed plant species Greene's (*Tuctoria greenei*) and slender Orcutt grass (*Orcuttia tenuis*), are known from the region, however, these species are closely associated with vernal pool ecosystems which were not documented on the project site. Federally designated critical habitat for slender Orcutt grass is located approximately 6.0 miles (9.7 km) north of the project site near a vernal pool complex.

Other Special-Status Plants. In addition to state or federally listed plant species several public agencies and private entities maintain lists of plants of conservation concern. The CDFW compiles these species, including CDFW and CNPS rankings of California rare plant rankings (CRPR) list 1, 2, 3, or 4, in its compendium of Special Vascular Plants, Bryophytes, and Lichens List (CDFW, 2024d). These plants are treated as special-status species and are afforded protection under CEQA.

Numerous plants with CNPS rankings were identified during the literature review as having some potential to occur within a 10-mile radius of the proposed project (See **Table 5.2-3**. Known and Potential Occurrence of Special-Status Plants, Bryophytes, Lichens, and Fungi within the project area). Sixty-three species were considered to have a low to high potential to occur based on their range, known habitat associations, and historic observations. It is important to note that other non-listed species may also occur but could not be verified due to an absence of records on the region.

Of these 27 have a moderate potential to occur and four have a high potential to occur. None of these species were detected by the Applicant during their botanical surveys but they have the potential to occur in the project area. Some of these include CRPR 1B and 2B species such as long-haired star-tulip (*Calochortus longebarbatus* var. *longebarbatus*)-CRPR: 1B.2, Callahan's mariposa-lily (*C. syntrophus*)-CRPR: 1B.1, rattlesnake fern (*Botrypus virginianus*)- CRPR: 2B.2, scalloped moonwort (*Botrychium crenulatum*)-CRPR: 2B.2, and Mingan moonwort (*B. minganense*)-CRPR: 2B.2. In addition, Butte County morning-glory (*Calystegia atriplicifolia* ssp. *buttensis*)-CRPR: 4.2, northern clarkia (*Clarkia borealis* ssp. *borealis*)- CRPR: 4.3, Butte County fritillary (*Fritillaria eastwoodiae*)-CRPR: 3.2, and English Peak greenbriar (*Smilax jamesii*)- CRPR: 4.2 may also occur. See **Table 5.2-3** (Known and Potential Occurrence of Special-Status Plants, Bryophytes, Lichens, and Fungi within the Project Area) for a list of the sensitive plants that have the potential to occur in or near the proposed project Site. Potential for occurrence is defined as follows:

- **Present:** Species or sign of their presence recently observed on the site.
- **High:** Species or sign not observed on the site, but reasonably certain to occur on the site based on conditions, species ranges, and recent records.

- **Moderate:** Species or sign not observed on the site, but conditions suitable for occurrence and/or an historical record exists in the vicinity.
- **Low:** Species or sign not observed on the site, and conditions marginal for occurrence.
- **Not likely to occur:** Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Taxa		Status[1]	Natural History & Habitat	Flowering Period	Potential to Occur[2]	Location of Occurrence
Scientific Name	Common Name					
Adiantum shastense	Shasta maidenhair fern	CRPR: 4.3	Perennial herb found in lower montane coniferous forests, sometimes on carbonate substrates. Occurs from 1,085 up to 5,035 ft (330-1,535 m) in Shasta Co.	Apr-Aug	Low	Outside of range. No CNDDB records within 10 miles.
Ageratina shastensis	Shasta ageratina	CRPR: 1B.2	Perennial herb found in chaparral, lower montane coniferous forests on rocky, and often carbonate substrates. Occurs from 1,310 to 5,905 ft (400-1,800 m) in Shasta Co.	Jun-Oct	Moderate	One CNDDB occurrence within ten miles. Suitable habitat is present.
Allium incomptum	Minnesota Mountain Onion	CRPR 1B.3	Only known from rocky, mountaintop habitat: "The *Allium incomptum* populations are associated with open, rocky, gravelly, mountain ridgetops in conifer forest and chaparral habitats at elevations of 1185 to 1295 meters (Kierstead and Lindstrand 2022, CCH2 2023). Little is known of the plants distribution in the broader region. Known from Minnesota, Slat Creek, and Bolloboka Mountains.	April-May	Low	Multiple calflora occurrences within 15 miles. Suitable habitat is present.in limited areas.
Allium sanbornii var. *sanbornii*	Sanborn's onion	CRPR: 4.2	Perennial bulbiferous herb found in chaparral, cismontane woodlands, lower montane coniferous forests on gravelly and usually serpentinite substrates. Occurs from 855 to 4,955 ft (260-1,510 m) in Butte, Calaveras, El Dorado, Nevada, Placerville, Plumas, Shasta, Tehama, Amador, Tuolumne, and Yuba cos.	May-Sep	Not Likely to Occur	Outside of range. No CNDDB records within 10 miles. Suitable habitat is present.
Anisocarpus scabridus	scabrid alpine tarplant	CRPR: 1B.3	Perennial herb found in upper montane coniferous forests on metamorphic and rocky substrates. Occurs from 5,415 to 7,545 ft (1,650-2,300 m) in Colusa, Humboldt, Lake, Mendocino, Shasta, Tehama, Amador, and Trinity counties.	Jul-Sep	Moderate	No CNDDB records within 10 miles. Suitable habitat is present.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Anthoxanthum nitens ssp. *nitens*	Vanilla grass	CRPR: 2B.3	Perennial grass like herb. Found in wetland and riparian areas, meadows and seeps. Occurs in Shasta County.	April-July	Moderate	CNDDB record over 10 miles southeast of project site. Suitable habitat is present.
Arctostaphylos klamathensis	Klamath manzanita	CRPR: 1B.2	Shrub found in rocky, gabbro, or serpentine soils in montane chaparral and lower montane, subalpine, and upper montane coniferous forests; 4,490 to 7,380 ft (502-2250 meters) in Scott Mtn. Divide, Slate Mtn., Klamath Mountains.	May-Aug	Moderate	No iNaturalist or CNDDB record withing 10 miles. Suitable habitat present.
Arctostaphylos malloryi	Mallory's manzanita	CRPR: 4.3	Perennial evergreen shrub found in chaparral and lower montane coniferous forests on volcanic substrates. Occurs from 2,510 to 4,200 ft (765-1,280 m) in Colusa, Shasta, and Trinity counties.	Apr-Jul	Moderate	Outside of range. No CNDDB records within 10 miles. Suitable habitat present.
Astragalus inversus	Susanville milk-vetch	CRPR: 4.3	Perennial herb found in Great Basin scrub, lower montane coniferous forests, and pinyon and juniper woodlands often on disturbed areas. Occurs from 2,905 to 6,070 ft (885-1,850 m) in Lassen, Modoc, Shasta, and Siskiyou counties.	May-Sep	Low	Outside of range. No CNDDB records within 10 miles. Suitable habitat present.
Botrychium ascendens	upswept moonwort	CRPR: 2B.3	Perennial rhizomatous herb found in mesic environments of meadows and seeps in lower montane coniferous forests. Occurs from 3,660 to 9,990 ft (1,115-3,045 m) in Alpine, Butte, Calaveras, El Dorado, Fresno, Inyo, Lassen, Mono, Modoc, Nevada, Placerville, Plumas, San Bernardino, Shasta, Tehama, Amador, Tulare, and Tuolumne counties.	(Jun) Jul-Aug	Low	Within range. Habitat present. One CNDDB occurrence within five miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Botrychium crenulatum	scalloped moonwort	CRPR: 2B.2	Perennial rhizomatous herb found in bogs and fens, freshwater marshes and swamps, meadows and seeps, lower and upper montane coniferous forests. Occurs from 4,160 to 10,760 ft (1,268-3,280 m) in Alpine, Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Inyo, Lassen, Los Angeles, Mono, Modoc, Nevada, Placerville, Plumas, San Bernardino, Shasta, Sierra, Siskiyou, Tehama, Amador, Trinity, Tulare, and Tuolumne counties.	Jun-Sep	Moderate	Within range. Habitat present. Six CNDDB occurrences within five miles, including one within 1 mile.
Botrychium minganense	Mingan moonwort	CRPR: 4.2	Perennial rhizomatous herb found in bogs and fens in lower montane coniferous forest. Occurs from 3,905 ft to 10,795 ft (1,190 -3,290 m) in Lassen, Modoc, Plumas, Shasta, and Siskiyou counties.	Jul-Sep (Oct)	Moderate	Within range. Habitat present. Three CNDDB occurrences within five miles, including one within 1 mile.
Botrychium pinnatum	northwestern moonwort	CRPR: 2B.3	Perennial rhizomatous herb found in mesic environments of bogs and fens and edges of meadows and seeps, in upper and lower montane coniferous forests. Occurs from 4,775 to 7,155 ft (1,455-2,180 m) in Amador, Butte, Calaveras, El Dorado, Fresno, Lassen, Madera, Mono, Modoc, Nevada, Placerville, Plumas, Shasta, Sierra, Siskiyou, Tehama, Amador, Trinity, Tulare, and Tuolumne counties.	Jul-Oct	Moderate	No CNDDB or iNaturalist occurrences within 10 miles. Suitable habitat present.
Botrychium montanum	western goblin	CRPR: 2B.1	Perennial rhizomatous herb found in mesic environments including meadows and seeps in upper and lower montane coniferous forests. Occurs from 4,805 to 7,155 ft (1,465-2,180 m) in Amador, Butte, El Dorado, Fresno, Lassen, Madera, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama, Amador, Trinity, and Tuolumne counties.	Jul-Sep	Moderate	Within range. Habitat present. No CNDDB or iNaturalist occurrences within 10 miles.
Botrypus virginianus	rattlesnake fern	CRPR: 2B.2	Perennial herb found in mesic environments including bogs and fens, meadows and seeps,	Jun-Sep	High	Within range. Habitat present.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			riparian forests streambanks in lower montane coniferous forests. Occurs from 2,345 to 4,445 ft (715-1,355 m) in Mendocino, Shasta, Siskiyou, and Trinity counties.			Seventeen CNDDB occurrences within 10 miles including eleven within 5 miles, and one within 1 mile.
Brasenia schreberi	watershield	CRPR: 2B.3 IUCN: LC	Perennial rhizomatous herb found in aquatic freshwater environments including marshes and swamps. Occurs from 0 to 7,220 ft (0-2,200 m) in Butte, Calaveras, El Dorado, Fresno, Glenn, Lake, Lassen, Mendocino, Merced, Nevada, Plumas, Sacramento, Shasta, Sierra, Siskiyou, San Joaquin, Sonoma, Sutter, Tehama, Amador, Trinity, Tulare, and Tuolumne counties.	Jun-Sep	Moderate	Within range. Habitat present. Two CNDDB occurrences within 10 miles.
Brodiaea coronaria ssp. *rosea*	Indian Valley Brodiaea	CRPR: 3.1	Perennial bulbiferous herb typically found in wetlands, often serpentinite substrates of closed-cone pine forests, chaparral, and valley grasslands. Occurs from 0 to 330 ft (0-100 m) in Colusa, Glenn, Lake, Shasta, Tehama, and Trinity counties.	May-Jun	Not Likely to Occur	Outside of range. No CNDDB records within 10 miles.
Calochortus longebarbatus var. *longebarbatus*	long-haired star-tulip	CRPR: 1B.2	Perennial bulbiferous herb found in mesic, clay environments including vernal pools, meadows, and seeps, in openings and drainages in Great Basin scrub, and lower montane coniferous forests. Occurs from 3,295 to 6,235 ft (1,005-1,900 m) in Modoc, Shasta, and Siskiyou counties.	Jun-Aug (Sep)	Moderate	Within range. Habitat present. Four CNDDB occurrences within 10 miles, including three within 5 miles.
Calochortus uniflorus	pink star-tulip	CRPR: 4.2	Perennial bulbiferous herb found in coastal prairie, coastal scrub, meadows and seeps, and North Coast coniferous forests. Occurs from 35 to 3,510 ft (10–1,070 m) in Colusa, Lake, Marin, Mendocino, Monterey, Napa, San Mateo, Santa Cruz, and Sonoma counties.	Apr-June	Not Likely to Occur	Outside of range. No habitat present. No CNDDB records within 10 miles. iNaturalist records in Shasta County.
Calochortus syntrophus	Callahan's mariposa-lily	CRPR: 1B.1	Perennial bulbiferous herb found in vernally mesic environments of cismontane woodlands,	May-Jun	Moderate	Marginal habitat present. Two

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			and valley and foothill grasslands. Occurs from 1,725 to 3,755 ft (525-1,145 m) in Butte, Shasta, Tehama, and Amador counties.			CNDDB occurrences within 5 miles.
Calystegia atriplicifolia ssp. *buttensis*	Butte County morning-glory	CRPR: 4.2	Perennial rhizomatous herb found in chaparral, lower montane coniferous forests, and valley and foothill grasslands on rocky substrates and sometimes roadsides. Occurs from 1,855 to 5,000 ft (565-1,524 m) in Butte, Del Norte, Mendocino, Shasta, Tehama, and Amador counties.	May-Jul	High	Within range. Habitat present. Fifty-seven CNDDB occurrences within 10 miles including thirty-four within 5 miles, and five within 1 mile.
Cardamine bellidifolia var. *pachyphylla*	fleshy toothwort	CRPR: 4.3	Perennial herb found in alpine boulder and rock fields, subalpine coniferous forests, and upper montane coniferous forests on rocky, scree, and talus substrates. Occurs from 6,235 to 9,300 ft (1,900-2,835 m) in Plumas, Shasta, and Siskiyou counties.	Jun-Aug	Not Likely to Occur	Outside of range. No CNDDB occurrences within 10 miles.
Carex comosa	bristly sedge	CRPR: 2B.1 IUCN: LC	Perennial rhizomatous herb found in coastal prairies, marshes and swamps (lake margins), and valley and foothill grasslands. Occurs from 0 to 2,050 ft (0-625 m) in Contra Costa, Fresno, Lake, Mendocino, Sacramento, San Bernardino, Santa Cruz, San Francisco, Shasta, San Joaquin, San Mateo, and Sonoma counties.	May-Sep	Not Likely to Occur	Outside of range. One CNDDB occurrence within10 miles.
Carex lasiocarpa	woolly-fruited sedge	CRPR: 2B.3 IUCN: LC	Perennial rhizomatous herb found in freshwater bogs and fens, and marshes and swamps (lake margins. Occurs from 5,580 to 6,890 ft (1,700-2,100 m) in Lassen, Modoc, Nevada, Placerville, Plumas, and Shasta counties.	Jun-Jul	Moderate	One CNDDB occurrence within10 miles. Known records from Shasta County.
Castilleja lassenensis	Lassen paintbrush	CRPR: 1B.3	Perennial herb found on volcanic substrates in meadows and seeps of subalpine coniferous forests. Occurs from 3,135 to 10,235 ft (955-3,120 m) in Lassen, Plumas, Shasta, Tehama, and Amador counties.	Jun-Sep	Moderate	Within range. Marginal habitat may be present. One CNDDB occurrence within 5 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Clarkia borealis ssp. *arida*	Shasta clarkia	CRPR: 1B.1	Annual herb found in openings of cismontane woodlands, and lower montane coniferous forests. Occurs from 1,610 to 1,950 ft (490-595 m) in Shasta, Tehama, and Amador counties.	Jun-Aug	Not Likely to Occur	Outside of range. Two CNDDB occurrences within 10 miles,
Clarkia borealis ssp. *borealis*	northern clarkia	CA: S4 CRPR: 4.3	Annual found in chaparral, cismontane woodlands and lower montane coniferous forests often in roadcuts/roadsides. Occurs from 1,310 to 5,135 ft (400-1,565 m) in Shasta and Trinity counties.	Jun-Sep	High	Within range. Habitat present. Twenty-two CNDDB occurrences within 10 miles, including ten within 5 miles, and one within 1 mile.
Cryptantha crinita	Silky cryptantha	CRPR: 1B.2	Cismontane woodland, Lower montane coniferous forest, Riparian forest, Riparian woodland, Valley and foothill grassland. Occurs from 200 to 3,985 ft (61-1,215 m) in Shasta, Tehama, and Butte counties.	Apr-May	Moderate	No iNaturalist records within 10 miles. Known from Shasta County.
Crataegus castlegarensis	Castlegar hawthorne	CRPR: 3	Perennial deciduous shrub found in moist rocky loam of riparian woodlands. Occurs from 0 to 4,775 ft (0-1,455 m) in Modoc, Plumas, and Shasta counties.	May-Jun (Jul)	Moderate	Within range. No CNDDB occurrences within 10 miles. Three iNaturlist records west of Montgomery creek.
Cuscuta jepsonii	Jepson's dodder	CRPR: 1B.2	Parasitic annual vine found in streambanks of lower montane and north Coast coniferous forests. Occurs from 3,935 to 7,545 ft (1,200-2,300 m) in Amador, Calaveras, Lake, Madera, Mendocino, Mariposa, Shasta, Siskiyou, Trinity, and Tulare counties.	Jul-Sep	Low	Habitat present. One CNDDB occurrence within 10 miles. Two iNaturalist records north of Burney.
Cypripedium montanum	mountain lady's-slipper	CRPR: 4.2	Perennial rhizomatous herb found in broadleaved upland forests, cismontane woodlands, and North Coast and lower montane coniferous forests. Occurs from 605 to 7,300 ft (185-2,225 m) in Amador, Butte, Del Norte, Glenn, Humboldt, Lassen, Madera, Mendocino,	Mar-Aug	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			Modoc, Mariposa, Plumas, Santa Cruz, Shasta, Siskiyou, San Mateo, Sonoma, Tehama, Amador, Trinity, and Tuolumne counties.			
Diplacus pygmaeus	Egg Lake monkeyflower	CRPR: 4.2	Annual herb found on clay, volcanic, and vernally mesic, substrates in streambanks, meadows and seeps of Great Basin scrub, lower montane coniferous forests, and pinyon and juniper woodlands. Occurs from 1,640 to 6,035 ft (500-1,840 m) in Calaveras, Lassen, Modoc, Plumas, Shasta, and Siskiyou counties.	May-Aug	Low	Within range. Marginal habitat present. No occurrences within 10 miles.
Drosera anglica	English sundew	CRPR: 2B.3	Carnivorous perennial herb found in mesic environments of bogs and fens, meadows and seeps. Occurs from 4,265 to 7,400 ft (1,300-2,255 m) in Butte, Lassen, Nevada, Plumas, Shasta, and Siskiyou counties.	Jun-Sep	Low	Within range. Limited habitat present. One CNDDB occurrence within 10 miles.
Epilobium oreganum	Oregon fireweed	CRPR: 1B.2	Bogs and fens, Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest. Occurs from 1,640 to 7,350 ft (500 -2,240 m) in Alpine, Del Norte Glenn, Humboldt, Inyo, Mendocino, Mono, Nevada, Placer, Plumas, Shasta, Sierra, Siskiyou, Tehama, Trinity, and Tuolumne counties.	Jun-Sep	Low	No CNDDB or inaturalist occurrences within 10 miles. Suitable habitat present.
Eriastrum tracyi	Tracy's eriastrum	CRPR: 3.2	Annual herb found in chaparral, cismontane woodlands, and valley and foothill grasslands. Occurs from 1,035 to 5,840 ft (315-1,780 m) in Colusa, Fresno, Glenn, Kern, Lake, Lassen, Santa Clara, Shasta, Stanislaus, Tehama, Amador, Trinity, and Tulare counties.	May-Jul	Moderate	Within range. Habitat present. One CNDDB occurrence within 10 miles.
Erigeron inornatus var. *calidipetris*	hot rock daisy	CRPR: 4.3	Perennial herb found on sandy and volcanic substrates in lower montane coniferous forests. Occurs from 3,610 to 6,350 ft (1,100-1,935 m) in Butte, Lassen, Plumas, Shasta, Siskiyou, Tehama, and Amador counties.	Jun-Sep	Low	Within range. Marginal habitat present. No CNDDB occurrences within 10 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Eriogonum ursinum var. *erubescens*	blushing wild buckwheat	CRPR: 1B.3	Perennial herb found on rocky, scree, and talus substrates of chaparral (montane), and lower montane coniferous forests. Occurs from 2,460 to 6,235 ft (750-1,900 m) in Shasta, Siskiyou, and Trinity counties.	Jun-Sep	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Eriophorum gracile	slender cottongrass	CRPR: 4.3	Perennial rhizomatous herb found in acidic environments of emergent bogs and fens, and meadows and seeps, of upper montane coniferous forests. Occurs from 4,200 to 9,515 ft (1,280-2,900 m) in Amador, Butte, Calaveras, El Dorado, Fresno, Lassen, Madera, Merced, Mariposa, Nevada, Placerville, Plumas, San Benito, Santa Clara, Shasta, Sierra, Siskiyou, Sonoma, Stanislaus, and Tuolumne counties.	May-Sep	Not Likely to Occur	Limited habitat present. No CNDDB occurrences within 10 miles.
Erythranthe inflatula	ephemeral monkeyflower	CRPR: 1B.2	Annual herb found in vernally mesic, sometimes gravelly or rocky substrates of Great Basin scrub, lower montane coniferous forests, and pinyon and juniper woodlands. Occurs from 4,100 to 5,710 ft (1,250-1,740 m) in Lassen, Modoc, Shasta, and Siskiyou counties.	May-Aug	Not Likely to Occur	Within range. Marginal habitat present. No CNDDB occurrences within 10 miles.
Erythranthe taylorii	Shasta limestone monkeyflower	CRPR: 1B.1	Annual herb found in carbonate crevices/openings and rocky outcrops, in cismontane woodlands, and lower montane coniferous forests. Occurs from 1,165 to 3,510 ft (355-1,070 m) in Shasta Co.	(Feb)Apr-May	Not Likely to Occur	Outside of range. No habitat present. No CNDDB occurrences within 10 miles.
Erythronium klamathense	Klamath fawn lily	CRPR: 2B.2	Perennial bulbiferous herb found in meadows and seeps, and upper montane coniferous forests. Occurs from 3,935 to 6,070 ft (1,200-1,850 m) in Shasta, and Siskiyou counties.	Apr-Jul	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Erythronium shastense	Shasta fawn lily	CRPR: 1B.2	Perennial bulbiferous herb that can form clumps due to bulb offsets. Found on north-facing or shaded rocky, usually carbonate, substrates in cismontane woodlands, and lower montane coniferous forests. Occurs from 1,150 to 3,345 ft (350-1,020 m) in Shasta Co.	(Feb)Mar-Apr	Not Likely to Occur	Outside of range. No habitat present. One CNDDB occurrence within 10 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Fritillaria eastwoodiae	Butte County fritillary	CRPR: 3.2	Perennial bulbiferous herb found in openings, sometimes serpentinite, substrates of chaparral, cismontane woodlands, and lower montane coniferous forests. Occurs from 165 to 4,920 ft (50-1,500 m) in Butte, El Dorado, Nevada, Placerville, Shasta, Tehama, Amador, and Yuba counties.	Mar-Jun	High	Within range. Habitat present. Twenty-three CNDDB occurrences within five miles, including one within 1 mile.
Gratiola heterofemale	Boggs Lake hedge hyssop	CRPR: 1B.2	Annual herb found in clay substrates of vernal pools, and marshes and swamps (lake margins). Occurs from 35 to 7,790 ft (10-2,375 m) in Colusa, Lake, Glenn, Shasta, Tehama, and Trinity counties.	Apr-Aug	Not Likely to Occur	No habitat present. No CNDDB occurrences within 10 miles. One record north of Hat Creek.
Harmonia stebbinsii	Stebbins harmonia	CRPR: 1B.2	Chaparral, Lower montane coniferous forest on serpentine soils. Occurs from 1,310 to 5,185 ft (400-1,580 m) in Fresno, Lake, Lassen, Madera, Mendocino, Merced, Modoc, Placer, Sacramento, San Joaquin, Shasta, Siskiyou, Solano, Sonoma, and Tehama counties.	May-Jun	Not Likely to Occur	Suitable habitat limited. Serpentine soils not detected. No CNDDB or iNaturalist records within 10 miles.
Hesperocyparis bakeri	Baker cypress	CRPR: 4.2	Perennial evergreen tree sometimes found on serpentinite and volcanic substrates, in chaparral, and lower montane coniferous forests. Occurs from 2,690 to 6,545 ft (820-1,995 m) in Butte, El Dorado, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Amador counties.	Perennial evergreen.	Low	No habitat present. No CNDDB occurrences within 10 miles. Known from west of Whittington Place.
Hulsea nana	little hulsea	CRPR: 2B.3	Perennial herb found on volcanic, sometimes, rocky or gravelly substrates in alpine boulder and rock fields, and subalpine coniferous forests. Occurs from 5,645 to 11,010 ft (1,720-3,355 m) in Shasta, Siskiyou, and Trinity counties.	Jul-Aug	Low	Outside of range. No habitat present. No CNDDB occurrences within 10 miles. iNaturalist records north of Burney.
Iliamna bakeri	Baker's globe mallow	CRPR: 4.2	Chaparral, Great Basin scrub, lower montane coniferous forest (openings), Pinyon and juniper woodland, often in burned areas or volcan soils.	Jun-Sep	Moderate	No CNDDB or iNaturalist occurrences within

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			Occurs from 3,280to 8,205 ft (1,000-3,280 m) in Colusa, Glenn, Lake, Lassen, Mendocino, Modoc, Napa, Shasta, Siskiyou, Tehama, and Trinity counties. Shasta, Siskiyou, and Trinity counties.			10 miles. Suitable habitat is present.
Juncus leiospermus var. *leiospermus*	Red Bluff dwarf rush	CRPR: 1B.1	Annual herb found in vernally mesic environments including meadows and seeps, vernal pools of valley and foothill grasslands, chaparral, and cismontane woodlands. Occurs from 115 to 4,100 ft (35-1,250 m) in Butte, Placerville, Shasta, Tehama, and Amador counties.	Mar-Jun	Moderate	Within range. Marginal habitat present. Two CNDDB occurrences within 10 miles including one within 5 miles.
Juncus luciensis	Santa Lucia dwarf rush	CRPR: 1B.2	Annual herb found in meadows and seeps, and vernal pools of chaparral, Great Basin scrub, and lower montane coniferous forests. Occurs from 985 to 6,695 ft (300-2,040 m) in Lassen, Monterey, Modoc, Napa, Nevada, Placerville, Plumas, Riverside, Santa Barbara, San Benito, San Diego, Shasta, and San Luis Obispo counties.	Apr-Jul	Moderate	Within range. Marginal habitat present. One CNDDB occurrence within five miles.
Leptosiphon rattanii	Rattan's leptosiphon	CRPR: 4.3	Annual herb found on sometimes rocky or gravelly substrates of cismontane woodlands and lower montane coniferous forests. Occurs from 5,580 to 6,560 ft (1,700-2,000 m) in Colusa, Glenn, Lake, Mendocino, Shasta, Siskiyou, Tehama, Amador, and Trinity counties.	May-Jul	None	Outside of range. No CNDDB occurrences within 10 miles.
Lewisia cantelovii	Cantelow's lewisia	CRPR: 1B.2	Perennial herb found in granitic, mesic, sometimes serpentinite substrates of broadleaved chaparral, cismontane woodlands, and lower montane and upland coniferous forests. Sometimes found in seeps. Occurs from 1,085 – 4,495 ft (330 – 1,370 m) in Butte, Nevada, Plumas, Shasta, Sierra, and Yuba counties.	May-Oct	Low	Within range. Marginal habitat present. No CNDDB occurrences within 10 miles.
Lewisia kelloggii ssp. *hutchisonii*	Hutchison's lewisia	CRPR: 3.2	Perennial herb often found in openings on slate, sometimes rhyolite tuff substrates in upper montane coniferous forests ridgetops. Occurs from 2,510 to 7,760 ft (765-2,365 m) in Alpine,	(Apr) May-Aug	Not likely to Occur	No habitat present. No CNDDB occurrences within 10

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			Amador, Butte, Calaveras, El Dorado, Humboldt, Nevada, Placerville, Plumas, Shasta, Sierra, Siskiyou, Trinity, and Tuolumne counties.			miles. Once occurrence near Burney.
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadowfoam	CRPR: 1B.2	Annual herb found in mesic environments including meadows and seeps of cismontane woodlands. Occurs from 950 to 3,610 ft (290-1,100 m) in Shasta Co.	Apr-Jun	Low	Marginal habitat. No occurrences within 10 miles.
Limnanthes floccosa ssp. *floccosa*	woolly meadowfoam	CRPR: 4.2	Annual herb found in vernally mesic environments including vernal pools of chaparral, cismontane woodlands, and valley and foothill grasslands. Occurs from 195 to 4,380 ft (60-1,335 m) in Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, Amador, and Trinity counties.	Mar-May (Jun)	Low	No habitat present. Three CNDDB occurrences within 10 miles.
Lycopus uniflorus	northern bugleweed	CRPR: 4.3	Perennial herb found in bogs and fens, and marshes and swamps. Occurs from 15 to 6,560 ft (5-2,000 m) in Humboldt, Lassen, Mariposa, Nevada, Placerville, Plumas, Shasta, Siskiyou, and Tuolumne counties.	Jul-Sep	Not likely to Occur	Marginal habitat present. No CNDDB occurrences within 10 miles.
Lysimachia thyrsiflora	tufted loosestrife	CRPR: 2B.3	Perennial herb found in mesic environments including meadows and seeps, and marshes and swamps of upper montane coniferous forests. Occurs from 3,200 to 5,495 ft (975-1,675 m) in Plumas and Shasta counties.	May-Aug	Moderate	Marginal habitat present. One CNDDB occurrence within five miles.
Meesia triquetra	three-ranked hump moss	CRPR: 4.2	Moss found in mesic soils of bogs and fens, and meadows and seeps, of subalpine and upper montane coniferous forests. Occurs from 4,265 to 9,690 ft (1,300-2,953 m) in Alpine, Butte, El Dorado, Fresno, Humboldt, Lassen, Madera, Modoc, Mariposa, Nevada, Placerville, Plumas, Riverside, Shasta, Sierra, Siskiyou, Solano, Tehama, Amador, and Tulare counties.	Jul	Low	Marginal habitat present. No CNDDB occurrences within 10 miles.
Meesia uliginosa	broad-nerved hump moss	CRPR: 2B.2	Moss found in damp soils of bogs and fens, and meadows and seeps of subalpine and upper coniferous forests. Occurs from 3,970 to 9,200 ft (1,210-2,804 m) in Butte, El Dorado, Fresno,	Jul-Oct	Low	Marginal habitat present. One CNDDB occurrence within five miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			Lassen, Modoc, Nevada, Plumas, Riverside, Shasta, Sierra, Siskiyou, Tehama, Amador, and Tulare counties.			
Navarretia subuligera	awl-leaved navarretia	CRPR: 4.3	Annual herb found on mesic, rocky substrates of chaparral, cismontane woodlands, and lower montane coniferous forests. Occurs from 490 to 3,610 ft (150-1,100 m) in Shasta, Tehama, and Amador counties.	Apr-Aug	Not Likely to Occur	Outside of range. No CNDDB occurrences within 10 miles.
Neviusia cliftonii	Shasta snow-wreath	CRPR: 1B.2	Perennial deciduous shrub found on metavolcanic and volcanic, sometimes carbonate substrates of cismontane woodlands, lower montane coniferous forests, and riparian woodlands often in streambanks. Occurs from 985 to 1,935 ft (300-590 m) in Shasta Co.	Apr-Jun	Moderate	Marginal habitat present. Twelve CNDDB occurrences within 10 miles, and three within 5 miles.
Orcuttia tenuis	slender Orcutt grass	Fed: Threatened CRPR: 1B.1	Annual herb often found on gravelly substrates of vernal pools. Occurs from 115 to 5,775 ft (35-,760 m) in Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, Tehama, and Amador counties.	May-Sep (Oct)	Not Likely to Occur	No habitat present. Three CNDDB occurrences within 10 miles.
Penstemon filiformis	thread leaved beartongue	CRPR: 4.2	Cismontane woodland, Lower montane coniferous forest, often on serpentine soils. Occurs from 1,475 to 6,150 ft (450-1,875 m) in Shasta, Siskiyou, and Trinity counties.	May-Aug (Sep)	Low	Marginal habitat present. No CNDDB or iNaturalist occurrences within 10 miles.
Penstemon cinicola	ash beardtongue	CRPR: 4.3	Perennial herb found on volcanic and sometimes rocky or sandy substrates in meadows and seeps of lower and upper montane coniferous forests. Occurs from 2,395 to 8,810 ft (730-2,685 m) in Del Norte, Lassen, Mono, Modoc, Plumas, Shasta, and Siskiyou counties.	Jun-Aug (Sep)	Low	Within range. Marginal habitat present. No CNDDB occurrences within 10 miles.
Penstemon heterodoxus var. *shastensis*	Shasta beardtongue	CRPR: 4.3	Perennial herb found on clay, volcanic, and often mesic substrates in meadows and seeps, of broadleaved upland forests, chaparral, upper and lower montane coniferous forests. Occurs from 3,610 to 7,875 ft (1,100-2,400 m) in Butte,	May-Sep	Not Likely to Occur	Marginal habitat present. No CNDDB occurrences within 10 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Amador counties.			
Picea engelmannii	Engelmann spruce	CRPR: 2B.2 IUCN: LC	Perennial evergreen tree of upper montane coniferous forests. Occurs from 3,495 to 7,005 ft (1,065-2,135 m) in Shasta, Siskiyou, and Trinity counties.	N/A	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Piperia colemanii	Coleman's rein orchid	CRPR: 4.3	Perennial herb often found in sandy substrates of chaparral, and lower montane coniferous forests. Occurs from 3,935 to 7,545 ft (1,200-2,300 m) in Amador, Butte, Calaveras, El Dorado, Lassen, Madera, Mariposa, Placerville, Plumas, San Diego, Shasta, Sierra, Siskiyou, Tehama, Amador, and Tuolumne counties.	Jun-Aug	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Poa sierrae	Sierra blue grass	CRPR: 1B.3	Perennial rhizomatous herb found in openings in lower montane coniferous forests. Occurs from 1,200 to 4,920 ft (365-1,500 m) in Butte, El Dorado, Nevada, Placerville, Plumas, and Shasta counties.	Apr-Jul	Moderate	Within range. Habitat present. One CNDDB occurrence within five miles.
Pogogyne floribunda	profuse-flowered pogogyne	CRPR: 4.2	Annual herb found in heavy clay soils of meadows and seeps, and vernal pools. Occurs from 3,100 to 5,725 ft (945-1,745 m) in Lassen, Modoc, Shasta, and Siskiyou counties.	May-Sep (Oct)	Not likely to Occur	Marginal habitat present. One CNDDB occurrence within 10 miles.
Polygonum bidwelliae	Bidwell's knotweed	CRPR: 4.3	Annual herb found on volcanic substrates of chaparral, cismontane woodlands, and valley and foothill grasslands. Occurs from 195 to 3,935 ft (60-1,200 m) in Butte, Shasta, Tehama, and Amador counties.	Apr-Jul	Not likely to Occur	No habitat present. No CNDDB occurrences within 10 miles.
Polygonum polygaloides ssp. *esotericum*	Modoc County knotweed	CRPR: 1B.3	Annual herb found in mesic environments including vernal pools, meadows and seeps of Great Basin scrub and lower montane coniferous forests. Occurs from 2,905 to 5,545 ft (885-1,690 m) in Modoc, Plumas, Shasta, and Sierra counties.	May-Sep	Not likely to Occur	Marginal habitat present. No CNDDB occurrences within 10 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

Potamogeton zosteriformis	eel-grass pondweed	CRPR: 2B.2	Annual herb found in freshwater aquatic environments including marshes and swamps. Occurs from 0 to 6,105 ft (0-1,860 m) in Contra Costa, Lake, Lassen, Merced, Mono, Modoc, Mariposa, and Shasta counties.	Jun-Jul	Not likely to Occur	Marginal habitat present. No CNDDB occurrences within 10 miles.
Potentilla newberryi	Newberry's cinquefoil	CRPR: 2B.3	Perennial herb found in drying margins of vernal pools, marshes, and swamps. Occurs from 4,265 to 7,220 ft (1,300-2,200 m) in Lassen, Modoc, Shasta, and Siskiyou counties.	May-Aug	Not likely to Occur	Marginal habitat present. One CNDDB occurrences within 10 miles.
Ptilidium californicum	Pacific fuzzwort	CRPR: 4.3	Liverwort, usually epiphytic on trees, fallen and decaying logs, and stumps; rarely on humus over boulders, of upper and lower montane coniferous forests. Occurs from 3,740 to 5,905 ft (1,140-1,800 m) in Del Norte, Humboldt, Mendocino, Shasta, Siskiyou, and Trinity counties.	May-Aug	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Scutellaria galericulata	Marsh skullcap	CRPR: 2B.2	Perennial rhizomatous herb found in mesic environments of meadows and seeps, marshes and swamps, lower montane coniferous forests. Occurs from 0 to 6,890 ft (0 – 2,100 m) in Contra Costa, El Dorado, Lassen, Modoc, Nevada, Plumas, Sacramento, San Joaquin, Shasta, and Siskiyou counties.	Jun-Sep	Low	Within range. Marginal habitat. No CNDDB occurrences within 10 miles.
Sedum paradisum ssp. *paradisum*	Canyon Creek stonecrop	CRPR: 1B.3	Perennial herb found on granitic and rocky substrates of broadleaved chaparral, upland, lower montane, and subalpine coniferous forests. Occurs from 985 to 6,235 ft (300-1,900 m) in Shasta and Trinity counties.	May-Jun	Low	Within range. Marginal habitat. No CNDDB occurrences within 10 miles.
Sidalcea celata	Redding checkerbloom	CRPR: 3	Perennial herb found on sometimes serpentinite substrates in cismontane woodlands. Occurs from 445 to 5,005 ft (135-1,525 m) in Plumas, Shasta, Siskiyou, Tehama, and Amador counties.	Apr-Aug	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Sidalcea gigantea	giant checkerbloom	CRPR: 4.3	Perennial rhizomatous herb in meadows and seeps of upper and lower montane coniferous forests. Occurs from 2,200 to 6,400 ft (670-	(Jan-Jun) Jul-Oct	Low	Within range. Marginal habitat present. No CNDDB

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			1,950 m) in Butte, Nevada, Plumas, Shasta, Sierra, Tehama, Amador, and Yuba counties.			occurrences within 10 miles.
Silene occidentalis ssp. *longistipitata*	long-stiped campion	CRPR: 1B.2	Perennial herb found in chaparral, upper and lower montane coniferous forests. Occurs from 3,280 to 6,560 ft (1,000-2,000 m) in Butte, Plumas, Shasta, Tehama, and Amador counties.	Jun-Aug	Low	Within range. Habitat present. One CNDDB occurrence within 10 miles.
Smilax jamesii	English Peak greenbrier	CRPR: 4.2	Perennial rhizomatous herb found in lake margins, streambanks, marshes and swamps, and sometimes mesic depressions of broadleaved upland, North Coast, and upper and lower montane coniferous forests. Occurs from 1,655 to 6,480 ft (505-1,975 m) in Del Norte, Shasta, Siskiyou, Trinity, and Yuba counties.	May-Jul (Aug-Oct)	Moderate	Thirty-one CNDDB occurrences within 10 miles, including twelve within 5 miles, and two within 1 mile.
Stachys pilosa	hairy marsh hedge-nettle	CRPR: 2B.3	Perennial rhizomatous herb found in mesic environments of meadows and seeps, and Great Basin scrub. Occurs from 3,935 to 5,805 ft (1,200-1,770 m) in Lassen, Modoc, Plumas, Shasta, Sierra, and Siskiyou counties.	Jun-Aug	Moderate	Marginal habitat present. Three CNDDB occurrences within 5 miles.
Stellaria longifolia	long-leaved starwort	CRPR: 2B.2	Perennial rhizomatous herb found in mesic environments of meadows and seeps, bogs and fens, riparian woodlands, and upper montane coniferous forests. Occurs from 2,955 to 6,005 ft (900-1,830 m) in Butte, Plumas, Shasta, Tehama, and Amador counties.	May-Aug	Moderate	Marginal habitat present. Two occurrences within 10 miles, including one within 5 miles.
Streptanthus longisiliquus	long-fruit jewelflower	CRPR: 4.3	Perennial herb found in openings of cismontane woodlands and lower montane coniferous forests. Occurs from 2,345 to 4,920 ft (715-1,500 m) in Butte, El Dorado, Nevada, Placerville, Shasta, Tehama, Amador counties.	Apr-Sep	Low	Within range. Habitat present. No CNDDB occurrences within 10 miles.
Stuckenia filiformis ssp. *alpina*	northern slender pondweed	CRPR: 2B.2	Perennial rhizomatous herb found in aquatic/shallow freshwater areas of marshes and swamps. Occurs from 985 to 7,055 ft (300-2,150 m) in Alameda, Butte, Contra Costa, El	May-Jul	Not Likely to Occur	Marginal habitat present. No CNDDB occurrences within 10 miles.

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			Dorado, Lassen, Merced, Mono, Modoc, Mariposa, Placerville, Santa Clara, Shasta, Sierra, San Mateo, Solano, and Sonoma counties.			
Trifolium piorkowskii	maverick clover	CRPR: 1B.2	Annual herb found in vernal pools, mesic valley and foothill grasslands, chaparral, cismontane woodlands, and lower montane coniferous forests. Occurs from 525 to 2,230 ft (160-680 m) in Shasta Co.	Apr-May	Not Likely to Occur	Outside of range. No habitat present. One CNDDB occurrence within 10 miles.
Trifolium siskiyouense	Siskiyou clover	CRPR: 1B.1	Perennial herb found in mesic environments of meadows and seeps, and sometimes streambanks. Occurs from 2,885 to 4,920 ft (880-1,500 m) in Shasta and Siskiyou counties.	Jun-Jul	Moderate	Within range. Marginal habitat present. One CNDDB occurrence within 1 mile.
Triteleia crocea var. *crocea*	yellow triteleia	CRPR: 4.3	Perennial bulbiferous herb found on granitic and serpentinite substrates of lower montane coniferous forests. Occurs from 3,935 to 6,560 ft (1,200-2,000 m) in Shasta, Siskiyou, and Trinity counties.	May-Jun	Low	Within range. Marginal habitat present. No CNDDB occurrences within 10 miles.
Utricularia minor	lesser bladderwort	CRPR: 4.2	Perennial stoloniferous carnivorous aquatic herb found in calcium-rich waters of bogs and fens, and shallow freshwater of marshes and swamps. Occurs from 2,625 to 9,515 ft (800-2,900 m) in Butte, El Dorado, Lassen, Mono, Modoc, Plumas, and Shasta counties.	(May-Jun) Jul-Aug	Not Likely to Occur	No habitat present. No CNDDB occurrences within 10 miles.
Vaccinium shastense ssp. *shastense*	Shasta huckleberry	CRPR: 1B.3	Perennial deciduous shrub found in mesic and acidic environments on rocky outcrops, sometimes seeps in disturbed areas, roadsides, often streambanks of chaparral, cismontane woodlands, riparian, lower montane and subalpine coniferous forests. Occurs from 1,065 to 4,005 ft (325-1,220 m) in Shasta counties.	(Jun-Sep) Dec-May	Low	Within range. Marginal habitat present. One CNDDB occurrence within 10 miles.
Viburnum ellipticum	oval-leaved viburnum	CRPR: 2B.3	Perennial deciduous shrub found in chaparral, cismontane woodlands, and lower montane coniferous forests. Occurs from 705 to 4,595 ft	May-Jun	Low	Within range. Habitat present. No

TABLE 5.2-3 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS PLANTS, BRYOPHYTES, LICHENS, AND FUNGI WITHIN THE PROJECT AREA

			(215-1,400 m) in Alameda, Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Lake, Mendocino, Napa, Placerville, Shasta, Solano, Sonoma, Tehama, and Amador counties.			occurrences within 10 miles.
Wakerobin trillium ovatum oettingeri	Salmon mountains wakerobin	CRPR: 4.2	Perennial rhizomatous herb found in partially shaded boggy soils of open to dense damp woodlands and forests at low to mid elevations. Occurs from 0 to 6,600 ft (0 -2,000 m) in the California coast ranges and in the Sierra Nevada foothills from Siskiyou Co. to Santa Barbara and Madera counties.	Apr-Aug	Not Likely to Occur	Not found in county. No habitat present. No occurrences within 10 miles.

1 - Conservation Status

Federal designations: (federal Endangered Species Act, U.S. Fish and Wildlife Service).
FD: Federally delisted FE: Federally listed, endangered
–PRO: Proposed for listing FT: Federally listed, threatened
–CAN: Candidate for listing

State (CA) designations: (California Endangered Species Act, California Department of Fish and Wildlife [CDFW])
SE: State listed, endangered SC: State candidate for listing, endangered or threatened
ST: State listed, threatened SR: State rare plant

California Native Plant Society Rare Plant Rank (CRPR) designations. Note: According to CNPS (http://www.cnps.org/cnps/rareplants/ranking.php), plants ranked as California Rare Plant Rank (CRPR) 1A, 1B, and 2 meet definitions as threatened or endangered and are eligible for state listing. That interpretation of the state Endangered Species Act is not in general use.
1A: Plants presumed extinct in California.
1B: Plants rare and endangered in California and throughout their range.
2: Plants rare, threatened, or endangered in California but more common elsewhere in their range.
3: Plants about which we need more information; a review list.
4: Plants of limited distribution; a watch list.
CBR: Considered but rejected. Plants that previously had a CRPR, or were considered for addition, but were rejected. ***California Rare Plant Rank Threat designations:***
.1 Seriously endangered in California (more than 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20–80% occurrences threatened)
.3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known)

2 - Definitions of occurrence probability: Estimated occurrence probabilities based on literature sources cited earlier and 2020 botanical surveys and habitat analyses reported here.
Present: Taxon was observed within the Project Area during 2020 botanical surveys.
High: Both a documented recent record (within 20 years) exists of the taxon within the Project Area or in the Study Area (approximately 5 miles) and the environmental conditions (including soil type) associated with taxon are present.
Moderate: Both a documented recent record (within 20 years) exists of the taxon within the Project Area or in the Study Area (approximately 5 miles) and the environmental conditions associated with taxon presence are marginal or limited within the Project Area and the Project

Area is located within the known current distribution of the taxon and the environmental conditions (including soil type) associated with taxon are present.

Low: A historical record (over 20 years) exists of the taxon within the Project Area or in the general region (approximately 10 miles) and the environmental conditions (including soil type) associated with taxon are present but marginal or limited.

Special-Status Wildlife

The project area and broader region supports habitat for a variety of sensitive species of wildlife. Surveys conducted by the Applicant identified several species that are known to occur either from direct observation or by sign. Based upon review of the literature, databases, the applicants extensive survey data, and coordination with resource agencies, a list of special-status wildlife species that are known or expected to occur in the project area was compiled (**Table 5.2-4** (Known and Potential Occurrence of Special Status Wildlife within the Project Area)).

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Taxon		Status[1]	Habitats/Geographic Location	Occurrence Potential[2]	Comments
Scientific Name	Common Name				
INVERTEBRATES					
Ariolimax buttoni	Button's banana slug	Global Rank: G2G3	Live on the floors of forests in the Pacific Northwest. Because they respire through their skin, they require a moist environment. They spend much of their time during the day in moist, dark areas like under logs or other forest debris. Occur in California from the eastern shore of San Francisco Bay (including Alameda, Sacramento, Mendocino, Marin, and San Francisco counties.) and the City of San Francisco to Monterey and Tuolumne counties and is expected in Shasta County.	Low	Habitat present. Nearest record on iNaturalist over 10 miles west.
Atractelmis wawona	Wawona riffle beetle	CA Rank: S1S2 Global Rank: G3	Near streams or intermittent stream channels where substrate is permanently damp; suitable conditions include coarse woody debris, riparian hardwood trees, deep leaf mold, and a relatively closed forest canopy. Possibly favors limestone substrates. Elevation range 550–3,150 ft. California where habitat is present.	Moderate	Habitat present Nearest record on CNDDB within 5 miles of Project Area.
Bombus occidentalis	Western bumble bee	CA Rank: S1 Global Rank: G3 IUCN: S State: SCE	Generalist forager in a wide range of habitats; essential pollinators of native plants and crops. Previously widespread throughout North America; currently largely restricted to high-elevation sites in Sierra Nevada with a couple of observations on Northern California coast. Relative abundance has declined 84% since late 1990s. Documented in Trinity County historically. (From: Bumble Bee Watch 2023, CDFW 2019, Jepson et al. 2014, Xerces Society 2018)	Moderate	Habitat present. Nearest record on CNDDB over 10 miles northeast and southeast.
Bombus crotchii	Crotch's bumble bee	CA Rank: S2 Global Rank: G2 IUCN: EN State: SCE	Occurs in open grassland and scrub habitats. This species is a ground nesting species. Food plant genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia,* and	Moderate	Habitat present in meadows, road edges, and the utility right of way. No

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			Eriogonum. Requires floral resources, undisturbed nest sites, and overwintering sites.		nearby iNaturalist or CNDDB occurrences.
Branchinecta conservatio	Conservancy Fairy Shrimp	CA Rank: S2 Global Rank: G2 IUCN: EN Fed: FE	Live mostly in large, turbid freshwater vernal pools called playa pools. Can be found starting in Nov and complete their life cycle by April. Can be differentiated from other fairy shrimp by flattened portions of antennae. Range in central valley from Tehama Co. to Merced Co. One outlying pop in Ventura Co. >	Not Likely to Occur	No habitat present. No nearby occurrences.
Branchinecta lynchi	Vernal Pool Fairy Shrimp	CA Rank: S3 Global Rank: G3 IUCN: VU Fed: FT	Vernal pool fairy shrimp are largely restricted to vernal pools, may also be found in other temporary waters. Can be found from Nov-early May. Eggs (cysts) remain viable for years, even if pool dries. Range in 32 counties across the central valley, central coast and southern CA (fws.gov).	Not Likely to Occur	No habitat present. No nearby occurrences.
Colligyrus convexus	canary duskysnail	CA Rank: S2 Global Rank: G2	A crenophile (i.e., organisms living only in spring environments) and periphyton (organisms growing on submerged stems and other parts of aquatic macrophytes) - perilithon (organisms growing on stones) grazer. Individuals are only found in shaded areas on the undersides of cobbles and boulders, and they appear to be photophobic. Known to inhabit cold, clear, well-oxygenated, unpolluted water in a cold spring complex tributary to the Pit River, and in a spring-fed portion of the mainstem of the Pit River.	Not Likely to Occur	Project site outside of expected range. Nearest record on CNDDB over 10 miles northeast.
Danaus plexippus	Monarch butterfly	CA Rank: Global Rank: G4T1T2Q IUCN: EN Fed: CAN	Overwinter in groves of trees scattered from Mendocino County south to Baja California; start to migrate inland in the spring feeding on flower nectar, mating and laying eggs on a variety of milkweed plants, the sole source of food for caterpillars. May occur as migrants in Shasta County.	Moderate	Habitat present. Nearest record on CNDDB over 5 miles east.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	CA Rank: S3 Global Rank: G3T3 Fed FT	The VELB is a medium sized beetle of around 2cm in length that is found only in association with its host plant, elderberry (Sambucus spp.). This subspecies is endemic to the Central Valley from Shasta Lake south to around Mendota. (USFWS ECOS page)	Not Likely to Occur	Project site outside of expected range. Nearest record on CNDDB over 10 miles southwest.
Fluminicola seminalis	Nugget pebblesnail	CA Rank: S3 Global Rank: G2 IUCN: DD	An aquatic snail typically found on gravel-cobble substrate in large creeks and rivers, but also occurs on mud substrates in large spring pools. Believed to prefer cool, clear, flowing water. Requires cold, unpolluted, well-oxygenated water with little sedimentation. Known from 15 to 22 sites, 5 of which are on Federal land, in the Pit and McCloud River drainages in Shasta County.	Not Likely to Occur	Project site outside of expected range. Nearest record on CNDDB over 10 miles northeast.
Gonidea angulata	Western ridged mussel	CA Rank: S2 Global Rank: G3 IUCN: VU	Found more often in streams than lakes and prefer constant water flow and well-oxygenated stable substrates in areas of low gradient. They can be found in substrates ranging in size from silt, clay, and sand to boulders. They are rarely found in waters that are continuously turbid such as glacial streams. Occur in California, Oregon, Washington, Idaho, Nevada and British Columbia. (From: Blevins et al. 2016, Jepson et al. 2010)	Low	Streams present in project area provide marginal habitat. Nearest record on CNDDB less than 5 miles north.
Helminthoglypta hertleini	Oregon shoulderband	CA Rank: S1S2 Global Rank: G3Q	Rocky areas such as talus slopes, but also suspected of being found in areas with permanent ground cover or moisture, including rock fissures or woody debris. Southwestern Oregon to Siskiyou, Shasta, and Tehama counties in California.	Moderate	Marginal habitat present. Nearest CNDDB record 10 miles west.
Juga occata	Scalloped juga	CA Rank: S1 Global Rank: G1 IUCN: EN	Restricted to swift, unpolluted, well-oxygenated large rivers with gravel boulder substrate, generally at low elevations. Occurs in lower Pit River, but status in the Sacramento River unknown. Known from Crystal Lake east of Four Corners.	Low	Habitat Present. Nearest record on CNDDB over 10 miles northeast.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Lanx patelloides	Kneecap lanx	CA Rank: S2 Global Rank: G2?	Prefers fast, cold, well-oxygenated water with cobble boulder substrate. Occurs in in the Sacramento, Klamath, and Pit rivers.	Moderate	Nearest record on CNDDB in Pit River less than 5 miles north.
Lepidurus cryptus	cryptic tadpole shrimp	Global Rank: G3	Occurs in temporary and permanent intermountain lakes and vernal pools, typically clear, slightly alkaline to slightly acidic, water. Found in the intermountain regions of northeastern California to southeastern Washington.	Not Likely to Occur	No habitat present. Nearest record on iNaturalist over 10 miles east.
Lepidurus packardi	Vernal Pool Tadpole Shrimp	Fed: FE	Found only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales and other seasonal wetlands in CA. Can be found from Nov-early May. Range encompasses the Central Valley, Delta and eastern Bay area. (fws.gov)	Not Likely to Occur	No habitat present. IPaC records within Shasta County.
Margaritifera falcata	Western pearlshell	CA Rank: S1S2 Global Rank: G4G5 IUCN: TH	A freshwater mussel species with the broadest distribution and longest lifespan of the western U.S. It's found in small streams and large rivers that support salmonid populations from California to Alaska and inland to western Montana, Wyoming and Utah. Although die-offs and substantial declines have been reported in some drainages, in other locations this species can still be found in large, densely populated aggrega-tions consisting of thousands of individuals.	Moderate	Habitat present. Nearest record on CNDDB in Pit River less than 10 miles northeast.
Monadenia churchi	Klamath sideband	CA Rank: S2 Global Rank: G2G3	Stable riparian zones within semi-dry mixed deciduous and conifer forests, but not restricted to riparian zones. Late successional forest with high canopy closure, a mixed conifer and hardwood component, and the presence of large, down woody debris or rock talus. Found under logs, in rocky areas, and on pine needle and oak leaf litter. Forest litter in the semi-dry areas inhabited by these species is important habitat component. Known from 11 sites, all historical	Low	Marginal habitat present. Nearest record on CNDDB over 10 miles east.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			except the type locality (along Oak Flat Creek, near the Klamath River, Siskiyou County, and five miles upstream from forks of the Salmon River, Siskiyou County, California		
Monadenia troglodytes wintu	Wintu sideband	CA Rank: S1S2 Global Rank: G1G2T1T2	Terrestrial snail restricted to limestone outcrops or related substrates, and are associated with caves, talus, or rocky outcrops in open, brushy, and late-successional pine-oak woodland areas. Forest litter and coarse woody debris are considered necessary to provide food and temporary cover. inhabiting the vicinity of Shasta Lake, in Shasta County. Occurs at eight sites, most of which are along the Pit River arm of the lake. Seven of those eight sites are on Federal land.	Low	Marginal habitat present. Nearest record on CNDDB over 10 miles east.
Pacifastacus fortis	Shasta Crayfish	Fed: FE	Forests of conifer or hardwood trees in areas with a constant, steady, and untainted flow of fresh water of seeps, springs, and stable streams. Lives in cold, clear, rocky areas of the mountain rivers, and feeds on microbes, algae, and small animals like snails. An endemic to Shasta County, California, where it is found only in isolated spots on the Pit River and Fall River Mills.	Not Likely to Occur	Project site outside of expected range. IPaC records within Shasta County.
Trilobopsis roperi	Shasta chaparral	CA/Fed: None	A terrestrial snail found in forest litter and coarse woody debris necessary to provide food and temporary cover from the semi-xeric (dry) conditions of the surrounding environment. Has been found within 100 m (328 ft) of limestone rockslides, draws, or caves with a cover of shrubs or oak. Known from 146 occurrences in Shasta County, California, 140 of which are on Federal land.	Low	Marginal habitat present. Nearest CNDDB record less than 5 miles west.
Vespericola shasta	Shasta hesperian	CA/Fed: None	A terrestrial snail considered an old-growth and riparian associate and is believed to inhabit damp ground at the margins of streams. Known from	Low	Marginal habitat present. Nearest

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			78 sites in Shasta County, California. Seventy-two of those occupied sites are federally owned.		CNDDB record less than 5 miles west.
FISHES					
Acipenser medirostris (pop. 1)	Green sturgeon – southern DPS	AFS: VU CA Rank: S1 Fed: TH Global: G21 IUCN: EN	Green sturgeons are anadromous though they are considered the most marine of the sturgeon species, spending only a limited amount of their life cycle in fresh water. Sturgeon spawn from March through July. Green sturgeon eggs hatch in fresh water and may leave as yearlings or stay in the river for up to 3 years. Most juveniles migrate downstream during the summer and fall of their second year. Juvenile sturgeon will use estuaries as a staging area before migrating to the ocean. During spawning runs, adults enter San Francisco Bay between mid-February and early May and migrate up the Sacramento River. Spawning occurs in cool sections of the upper Sacramento River. After hatching, larvae and juveniles migrate downstream toward the Sacramento-San Joaquin Delta and estuary. After rearing for a few years, they move out to the ocean. As adults, both population segments of green sturgeon migrate seasonally along the West Coast. They congregate in bays and estuaries in Washington, Oregon, and California during the summer and fall months. During winter and spring months they congregate off of the northern Vancouver Island in British Columbia, Canada.	Not Likely to Occur	Project site outside of expected range. Nearest occurrence record on CNDDB along the Pit River less than five miles west.
Cottus asperrimus	Rough sculpin	AFS: VU CDFW: FP Global Rank: G2 IUCN: NT State: ST State Rank: S2	Primarily found in clear, cool, fast water. They live in spring-fed streams where water temperatures rarely exceed 15°C and occupy areas with aquatic vegetation and a sand or gravel substrate. Prefer cool water, but are capable of surviving in lakes or reservoirs where	Not Likely to Occur	Marginal habitat present on project site however habitat is present nearby (i.e., Pit River tributaries). Nearest

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			surface water temperatures reach 30°C. They are commonly found in association with Marbled Sculpins, Rainbow Trout, Sacramento Suckers, Tui Chubs, and Pit-Klamath Brook Lampreys. Occur only in the Pit River system in Shasta and Lassen counties.		occurrence on CNDDB along the Pit River over ten miles north.
Cottus klamathensis macrops	Bigeye marbled sculpin	AFS: VU CDFW: SSC Global Rank: G4T2T3 State Rank: S2S3swift	Well-adapted to large, clear, cool (< 20 o C summer temperatures) spring-fed streams but also adjusted to the conditions found in some reservoirs. Typically, found in low-gradient runs and pools with abundant aquatic vegetation and coarse substrates, especially cobble, boulder, and gravel. Habitat use does not differ between adults and juveniles with respect to water velocity, but juveniles are found in shallower water. Use may shift in the presence of competitors such as Pit sculpin in riffles of the Pit River. Distributed throughout the middle reach of the Pit River. Found in the main river below Britton Reservoir, lower Hat Creek, Sucker Springs Creek, and Clark Creek. It is the dominant sculpin in the sections of Lower Hat Creek and Burney Creek just above Britton Reservoir, as well as the lower reaches of streams flowing into reservoirs of the lower Pit River, the lower Pit River itself, and Fall River.	Likely to Occur	Habitat present (i.e., Pit River tributaries). Nearest occurrence on CNDDB along the Pit River less than ten miles north.
Entosphenus lethophagus	Pit-Klamath brook lamprey	AFS: VU CA Rank: S3 CDFW: SSC Global Rank: G3G4 IUCN: LC	Principally occupy habitats in clear, cool (summer temperatures < 25ºC) rivers and streams in areas with fine substrates and beds of aquatic plants. Require gravel riffles in streams for spawning, with muddy backwater habitats downstream of spawning areas for ammocoete burrows. In the Pit River system, common in backwaters of the spring-fed Fall River and Hat Creek. Only found in the Pit River-Goose Lake basin in California and Oregon as well as in the	Not Likely to Occur	Habitat present (i.e., Pit River tributaries). Within range. Nearest occurrence on CNDDB along the Pit River less than five miles north.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			upper Klamath basin, upstream of Klamath lakes in Oregon. Distributed throughout the Pit River basin and, presumably, the Goose Lake basin in both California and Oregon.		
Entosphenus tridentatus	Pacific lamprey	CA Rank: S3 CDFW: SSC Global Rank: G4	Requires different habitats depending on its life stage. Occurring from cool mountain slopes to moist coastal drainages to arid southern chaparral, prefers colder water with moderate to slower velocities. Adults will build nests in gravel areas that have canopy cover, gravel and cobble substrates, vegetation, and woody debris. e year before spawning. During that time, they may shrink in size up to 20 percent. Most upstream migration takes place at night. Adult size at the time of migration ranges from about 15 to 25 inches. After spawning, males and females die, and their bodies provide valuable marine-derived nutrients for other aquatic residents. One of the most widely distributed anadromous species along the Pacific Rim. Their distribution includes major river systems such as the Fraser, Columbia, Klamath-Trinity, Eel and Sacramento-San Joaquin rivers.	Not Likely to Occur	Not within range. Nearest occurrence on CNDDB Dry Clover Creek over ten miles southwest.
Hesperoleucus mitrulus [Lavinia symmetricus mitrulus]	Northern (Pit) roach	AFS: VU CA Rank: S2 CDFW: SSC Global Rank: G2	Capable of adapting to varying habitats from coastal streams to mountain foothill streams. Predominately found in small warm streams but capable of thriving in larger colder streams with diverse conditions. They may occupy several different habitat types within a single drainage. Extreme tolerance includes temperatures ranging from 30-35ºC and dissolved oxygen levels as low as 1-2 ppm. In-stream location may vary depending on geography and predators. When Pikeminnow are present, roach will stick to the stream margins, whereas in the absence of these piscivorous fish roach may venture into deeper	Moderate	Habitat present (i.e., Pit River tributaries). Within Range. Nearest occurrence on CNDDB along the Pit River less than five miles north.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			pools. Restricted to several tributaries of the upper Pit River.		
Hypomesus transpacificus	Delta smelt	Fed: FT	Life cycle follows the four seasons—spring spawning in fresh water, summer migration/ rearing in the low salinity zone, fall maturation in the low salinity zone, and winter upstream migration shortly before spawning. Most spawning happens in tidally influenced backwater sloughs and channel edge waters. An endemic to California that only occurs in the San Francisco Estuary.	Not Likely to Occur	Project site outside of expected range. IPaC within Shasta County where habitat is present.
Mylopharodon conocephalus	Hardhead	CA Rank: S3 CDFW: SSC Global Rank: G3 IUCN: LC	Depending on life stage, can be found in shallow to deep clear pools of rivers with substrates of sand, gravel, or boulders. Found in the lower half of the water column in rivers and streams but in slower flows or still waters, such as reservoirs, it can be found close to the surface. Always in association with the Sacramento pikeminnow (*Ptychocheilus grandis*) and typically with the Sacramento sucker (Catostomus occidentalis occidentalis). It cannot normally be found in waters where alien species, especially sunfish, are dominant. Range includes much of the drainage basin of the Sacramento and San Joaquin Rivers, and widely distributed in the foothill streams within the range. The Kern River is the southernmost part of the range and it reaches north to the Pit River drainage in Modoc County. (From: Moyle et al. 2015)	Moderate	Habitat present (i.e., Pit River tributaries). Within Range. Nearest occurrence on CNDDB along the Pit River less than five miles north.
Oncorhynchus mykiss irideus pop. 11	Steelhead - Central Valley DPS	AFS: TH CA Rank: S2 Fed: FT Global Rank: G5T2Q	Depending on life stage, can be found in freshwater rivers, streams, estuaries, and marine environments. Adults prefer freshwater systems with cool temperatures (up to approximately 52 °F [11°C]), at least 7 inches deep, with moderate to low water velocity. During spawning, adults prefer freshwater streams or lakes with low	Not Likely to Occur	Project site outside of expected range. Nearest occurrence on CNDDB along the Old Cow Creek over ten miles south.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			velocity. Juveniles move into deeper and more vigorous waters as they grow. Summer-run DPS Central Valley/pop. 11 steelhead trout occur in the Sacramento and San Joaquin rivers and their tributaries, and the Coleman National Fish Hatchery and the Feather River Fish Hatchery populations. Habitat requirements are similar across species. (From: Sources)		
Oncorhynchus mykiss ssp. *2*	McCloud River redband trout	AFS: VU CA Rank: S1S2 CDFW: SSC Global Rank: G5T1T2	Depending on life stage, can be found in freshwater rivers, streams, estuaries, and marine environments. Adults prefer freshwater systems with cool temperatures (up to approximately 52 °F [11°C]), at least 7 inches deep, with moderate to low water velocity. During spawning, adults prefer freshwater streams or lakes with low velocity. Juveniles move into deeper and more vigorous waters as they grow. Summer-run steelhead trout ssp. 2 are native to the upper McCloud River, a tributary of the Sacramento River (Shasta and Siskiyou counties). Currently, they persist only in four small (< 2 km, or 1.2 mi.) isolated streams upstream of the McCloud River's Middle Falls that disappear underground into highly porous volcanic rock before connecting with the mainstem McCloud River downstream. Habitat requirements are similar across species. (From: Sources)	Not Likely to Occur	Project site outside of expected range. Nearest occurrence on CNDDB along the McGill Creek over ten miles northeast.
Spirinchus thaleichthys	Longfin smelt	Fed: CAN	Pelagic fish (occurring mainly in open water habitats) that occur in bays and estuaries from northern CA north along the coast through Alaska. Historically found in the San Francisco Estuary and the Sacramento/San Joaquin Delta (Bay-Delta), Humboldt Bay, and estuaries of the Eel River and Klamath River. Uses a variety of	Not Likely to Occur	Project site outside of expected range. IPaC within Shasta County where habitat is present

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			habitats including nearshore waters, sloughs, estuaries, and lower portions of freshwater streams. Reproduction occurs in low salinity to freshwater habitats. The federal candidate status is for the San Francisco Bay-Delta DPS.		
AMPHIBIANS					
Ambystoma macrodactylum sigillatum	Southern long-toed salamander	CA Rank: S3 CDFW: SSC Global Rank: ST4	Meadows and lakes at high elevations in Sierra Nevada, Cascade, and Klamath ranges. Adults mainly terrestrial outside of breeding season and use mammal burrows or moist areas under downed woody debris or rocks. Occurs Northeast and along the northern Sierra Nevada south to Garner Meadows and Spicer Reservoir, and in Trinity and Siskiyou Counties near the Trinity Alps. It also occurs in southwestern Oregon.	Moderate	Habitat present. One historical record in the project area on CNDDB. Several CNDDB records within ten miles.
Ascaphus truei	Pacific (aka coastal) tailed frog	CA Rank: S3S4 CDFW: SSC Global Rank: G4	Permanent cool streams in conifer-dominated habitats including redwood, Douglas-fir, Klamath mixed-conifer, montane hardwood conifer, and ponderosa pine. Prefer old growth forest habitats but occasionally inhabit areas without trees. The California range is from near Anchor Bay, Mendocino County, north along the coast to the Oregon Border and as far east as near Big Bend, Shasta County.	High	Habitat present. One CNDDB occurrence in the project area. Multiple CNDDB records within ten miles.
Hydromantes samweli	Samwel Shasta salamander	CA Rank: S3 Global Rank: G3 IUCN: VU NFP: S&M State: ST	Found around cliff faces, vertical cavern walls and level ground in mixed forests of Douglas fir, pines, and oaks. Lives in moist caves and rock cracks. Mostly associated with limestone outcrops, but has been found in a volcanic outcrop, and others in forest areas with no rock outcrops. Found at elevations between 800-2000 feet. Endemic to California in the Cascade Range near Shasta Lake, Shasta County.	Low	Habitat present. Nearest occurrence on CNDDB upland of Shasta Lake over ten miles west.
Hydromantes shastae	Shasta salamander	CA Rank: S3 Global Rank: G3 IUCN: VU	Found around cliff faces, vertical cavern walls and level ground in mixed forests of Douglas fir, pines, and oaks. Lives in moist caves and rock	Not Likely to Occur	Likely out of elevational range. Limited habitat

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

		NFP: S&M State: ST	cracks. Mostly associated with limestone outcrops, but has been found in a volcanic outcrop, and others in forest areas with no rock outcrops. Found at elevations between 800-2000 feet. Endemic to California in the Cascade Range near Shasta Lake, Shasta County.		present. Nearest occurrence on CNDDB in Shasta Lake over ten miles west.
Hydromantes wintu	Wintu shasta salamander	CA Rank: S3 Global Rank: G3 IUCN: VU NFP: S&M State: ST	Found around cliff faces, vertical cavern walls and level ground in mixed forests of Douglas fir, pines, and oaks. Lives in moist caves and rock cracks. Mostly associated with limestone outcrops, but has been found in a volcanic outcrop, and others in forest areas with no rock outcrops. Most locations are at elevations between 800 - 2000 ft. (244 - 610 meters.) In 2007 a single adult was found at 3,800 ft. (1158 meters) on Bohemotash Mountain in Shasta County.	Not Likely to Occur	Likely out of elevational range. Limited habitat present. Nearest occurrence on CNDDB near the Pit River five miles west. Multiple occurrences on CNDDB and iNaturalist within ten miles. Appear to have extremely limited range and distribution.
Rana boylii (pop.1)	Foothill yellow-legged frog – North Coast DPS	CA Rank: S4 Global Rank: G3TNRQ State: SSC	Small tributary streams with perennial water adjacent to terrestrial riparian habitat. Known to hide in springs, seeps, pools, woody debris, root wads, undercut banks, clumps of sedges, and large boulders adjacent to pools. Breeding habitat characterized by wider, more sunlit mainstream channels. Found from the Pacific Coast to the western slopes of the Sierra Nevada and Cascades mountains, up to approximately 5,000 feet in elevation.	Moderate	Habitat present. One historical record in the project area on CNDDB. Several CNDDB and iNaturalist along Pit River and other Shasta Lake tributaries records within ten miles to the west. eDNA sampling, did not identify occurrence of species on site however the data is almost 5 years old.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Rana cascadae	Cascades frog	CA Rank: S3 CDFW: SSC Global Rank: USFS: S State: SE-CAN	Prefers montane and subalpine landscapes above 4,000 ft. (1200 m). Associated with riparian woodland around mountain lakes, small streams, ponds, and in meadows up to timberline. Historically, this frog was found in fragmented populations in extreme northern California, from the edge of the northern Sierra Nevada mountains to Mt. Lassen, Mt. Shasta, the Marble Mountains, and the Trinity Alps. It is now missing from an estimated 50 percent of its former range in California, and most of its former southern-most locations, including Mt. Lassen.	Moderate	Habitat present. Nearest occurrence on CNDDB within five miles. Multiple occurrence records on CNDDB and iNaturalist within ten miles.
Rana draytonii	California red-legged frog	Fed: FT CDFW: SSC	Inhabits quiet pools of streams, marshes and ponds, prefers shorelines with extensive vegetation. Eggs attached to veg in permanent pools, breeds from Jan-July. Occurs along the Coast Ranges from Mendocino County south and in portions of the Sierra Nevada and Cascades ranges. (CDFW page)	Not Likely to Occur	Habitat present. At extreme northern range. No occurrence on CNDDB within 10 miles. No iNaturalist records in Shasta or Lassen Counties.
Rhyacotriton variegatus	Southern torrent salamander	State: SSC	Shaded, cold water in rocky, permanent streams or seeps in closed canopy, old-growth forests near moving water, often on mossy rocks in trickling water or in splash zone.	Not Likely to Occur	No old growth habitat present. No occur-rence on CNDDB within 10 miles. No iNaturalist records in Shasta or Lassen Counties.
REPTILES					
Emys (=Actinemys) marmorata	Western (=northwestern) pond turtle	CA Rank: S3 CDFW: SSC Global Rank: S3 IUCN: VU	Permanent or nearly permanent bodies of water in various habitat types with basking sites such as partially submerged logs, vegetation mats, or open mud banks. Below 6,000 ft. elevation. Northwestern pond turtle species range is north of the San Francisco Bay area plus populations from the Great Central Valley north including the introduced Nevada population	Moderate	Marginal habitat present. Nearest occurrence on CNDDB along Little Cow Creek within 5 miles.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

BIRDS					
Accipiter cooperii	Cooper's hawk	CDFW: WL Global: G5 CA Rank: S4 IUCN: LC	Nest is a stick platform lined with bark. Usually nests in second-growth conifer stands, or in deciduous riparian areas, usually near streams. Dense stands of live oak, riparian deciduous, or other forest habitats near water used most frequently. Also found among trees along rivers through open country, and increasingly in suburbs and cities where some tall trees exist for nest sites. A breeding resident throughout most of the wooded portion of California. Breeds in southern Sierra Nevada foothills, New York Mts., Owens Valley, and other local areas in southern California. Ranges from sea level to above 0-9000 ft.	High	Habitat present. Within range. One CNDDB occurrence record in the project area. Multiple eBird and iNaturalist records within five miles and CNDDB records within ten miles. One Hatchet Ridge mortality record.
Accipiter gentilis	Northern goshawk	CDFW: SSC Global: G5 CA Rank: S3	Mature, dense conifer and deciduous forest interspersed with meadows, other openings, and riparian, at middle to higher elevations. Near water ~2,000-10,000 ft. Breeds in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mts., in Mt. Pinos and San Jacinto, San Bernardino, and White Mts.	High	Habitat present. Within range. Multiple CNDDB occurrence records in the project area. Multiple CNDDB, eBird, iNaturalist records within five miles.
Accipiter striatus	Sharp-shinned hawk	State: SSC	Mature, dense conifer and deciduous forest interspersed with meadows, other openings, and riparian, at middle to higher elevations. Near water. Elevation range ~2,000-10,000 ft. Breeding resident in North Coast Ranges, Klamath, Cascade, Warner, and Sierra Nevada Mountains; Mount Pinos, San Jacinto, San Bernardino, and White Mountains. (From: ABB 2020, CDFW 2020g)	Present	Habitat present. Observed during surveys. Within range. Multiple eBird, occurrence records within five miles. Additional eBird and iNaturalist records within ten miles. One Hatchet Ridge mortality record.
Antigone canadensis tabida	Greater sandhill crane	CA Rank: S2 Global Rank: G5T5	Nests in wetland habitats in northeastern California and other states; winters in the Central	Present	CNDDB record within 10 miles west of the

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

		CDFW: FP State: ST	Valley. Prefers grain fields within 4 miles of a shallow body of water used as a communal roost site; irrigated pasture used as loafing sites.		project site. Known from Shasta County on iNaturalist. Observed overflying the site. Known migratory pathways occur immediately adjacent to the project site.
Antigone canadensis canadensis	Lesser sandhill Crane	State: SSC	The Lesser Sandhill Crane is a winter resident and migrant in California from mid-September (mainly Oct) to early April (most depart late Feb–early Mar). Roost sites are in a variety of wetland habitats, where cranes spend the night standing in shallow water.	Present	Likely observed over flying the site.
Agelaius tricolor	Tricolored blackbird	State: ST CDFW: SSC USFWS: BCC	Colonial breeder that forms the largest breeding colonies of any North American landbird. Breeds near fresh water, preferably wetlands with tall cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Many colonies have been reported in Himalayan blackberry, silages, and grain fields near diaries. Colonies in cereal crops and silages are often destroyed by harvesting and plowing of agricultural lands.	High	Likely to be present during migration. Documented occur-rences of tricolored blackbirds in Shasta County, although none within 10 miles of the Project Area. Known to occur within the Fall River IBA, approximately 20 miles northeast of the Project.
Aquila chrysaetos	Golden eagle	Fed: none State: WL, S4	Nests in dense, even-aged single-layered forest canopy; usually in dense, pole, and small-tree stands of conifers, which are cool, moist, shaded, little groundcover, near water. Forages in forest openings or edges. Breeds throughout California, including the northern half of the state; lesser extent in the mountains of southern California.	Present	Habitat present. Observed during surveys. Within range. One ebird occurrence record in the project area. Multiple eBird,

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			(From: ABB 2020, CDFW 2020g, Small 1994, Stephenson and Calcarone 1999)		occurrences within five and ten miles.
Ardea herodias	great blue heron	CA Rank: S4 CDF: S Global Rank: G5 IUCN: LC	Shallow estuaries and fresh and saline emergent wetlands. Less common along riverine and rocky marine shores, in croplands, pastures, and in mountains above foothills. Common July to October in salt ponds where fish are numerous. Locally common near rookeries. Occurs all year throughout most of California. Few rookeries are found in southern California, but many are scattered throughout northern California	Moderate	Marginal habitat present. Within range. Multiple eBird and one CNDDB occurrence record(s) within five miles. Multiple CNDDB, eBird, and iNaturalist records in the surrounding area.
Athene cunicularia	burrowing owl	State: Candidate for listing/CSSC	In California, western burrowing owls are yearlong residents of flat, open, dry grassland and desert habitats at lower elevations (Bates, 2006). Although western burrowing owls prefer large, contiguous areas of treeless grasslands, they have also been observed in fallow agriculture fields, golf courses, cemeteries, road allowances, airports, vacant lots in residential areas and university campuses, and fairgrounds when nest burrows are present.	Low	Marginal habitat but could occur along cleared utility rights of way or along in open meadows, Very Limited habitat. Known from Modoc County.
Baeolophus inornatus	Oak titmouse	USFWS: BCC	Common resident in a variety of habitats but is primarily associated with oaks. Occurs in montane hardwood-conifer, montane hardwood, blue, valley, and coastal oak woodlands, and montane and valley foothill riparian habitats in cismontane California, from the Mexican border to Humboldt Co. Range encircles San Joaquin Valley, extending east from the coast through Kern Co. onto the western slope of the Sierra Nevada north to Shasta Co. Scattered and local populations north of Humboldt Co. near the coast, and locally in Siskiyou Co.	Moderate	Habitat present. Within range. Multiple eBird occurrence records within five miles. Multiple eBird, and iNaturalist records in the greater surrounding area.
Buteo regalis	Ferruginous hawk	CA Rank: S3S4 Global Rank: G4 IUCN: LC	Winter resident and migrant at lower elevations and open grasslands in Modoc Plateau, Central Valley, Coast Ranges. Open grasslands,	High	Likely to be present during migration. Closest iNaturalist

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

		CDFW: WL	sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. (From: ABB 2020, CDFW 2020g)		record over 10 miles away from Project site. No CNDDB or ebird record within Shasta County.
Buteo swainsoni	Swainson's hawk	State: ST	Typical habitat is open desert, grassland, or cropland containing scattered large trees or small groves. Nests peripheral to riparian systems or in lone trees in agricultural fields or pastures and roadside trees when available and adjacent to suitable foraging habitat. Has become increasing depending on agriculture for foraging. Breeding range throughout central valley and NE part of CA. Mostly migratory, some yearlong residents in Central Valley.	High	Likely to be present during migration. Not likely to nest on the site.
Carpodacus cassinii	Cassin's Finch	USFWS: BCC	Common montane resident. Open coniferous forests, in lodgepole pine, red fir, and subalpine conifer habitats. Wet meadows with grassy openings; and semi-arid forests, Breeds in most higher mountain ranges in California. Occurs regularly in Cascade Range and Sierra Nevada, Great Basin ranges south to Inyo Mts., inner coastal ranges south to Mendocino Co., and southern California ranges south to Santa Rosa Mts., Riverside Co. May nest in Kingston and New York Mts. In winter in pinyon-juniper habitat east of Cascade Range and Sierra Nevada. A rare migrant in southern deserts, and irregular in California foothills and lowlands.	Present	Habitat present. Observed during surveys. Within range. Multiple eBird occurrence records within five miles. Multiple eBird, and one iNaturalist record(s) in the greater surrounding area.
Chaetura vauxi	Vaux's swift	CA Rank: S3 Global Rank: G5 IUCN: VU CDFW: SSC USFWS: BCC	Cavities in large, hollow trees and snags in redwood and Douglas-fir habitats; less frequently in chimneys and other artificial structures. Strong association with old-growth forest. Breeds in coniferous and mixed coniferous forests; requires large-diameter, hollow trees for breeding and	Present	Habitat present. Observed during surveys. No iNaturalist or ebird records within 10 miles of project site.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			roosting; forages in areas of open water where insect prey congregates.		
Chamaea fasciata	Wrentit	USFWS: BCC	Common resident of California chaparral habitat. Frequents shrub understory of coniferous habitats from the coast to lower regions of mountains throughout cismontane California. Absent east of the Cascade-Sierra Nevada crest in Great Basin and southeastern deserts, except extends east in small numbers into southwestern Modoc Co. and into eastern Plumas Co. Absent from Channel Islands. Has been found post-breeding up to 2500 m (8200 ft) in San Jacinto Mts., Riverside Co, and up to 2100 m (7000 ft) in Yosemite area.	Moderate	Marginal habitat present. Within range. Multiple eBird occurrences within five miles and the greater surrounding area.
Coccothraustes vespertinus	Evening Grosbeak	USFWS: BCC	Dense mixed coniferous forests dominated by firs. Strongly based upon an ample supply of buds, seeds, berries or other fruits, in trees and shrubs, rather than a particular habitat. Occasionally, occurs in foothills and lowlands, and in mountains west of southern deserts. Sporadically in southern deserts in nearby downslope areas and in Great Basin. Cascade Range, Sierra Nevada, Warner, Siskiyou, and Trinity Mts., breeding mostly in Also breeds, at least sporadically, in coastal forests of Humboldt Co., and may breed in aspens in White Mts.	High	Habitat present. Within range. One ebird occurrence record in project area. Multiple eBird occurrences within five miles and the greater surrounding area. One Hatchet Ridge mortality record.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Coccyzus americanus	Yellow-billed Cuckoo	FED: FT USFWS: BCC	Extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, which abut slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component. In Sacramento Valley, also utilizes adjacent orchards, especially of walnut. Along Colorado River, may inhabit mesquite thickets where willow is absent. Occurs along the Colorado River, Sacramento and Owens valleys; along the South Fork of the Kern River, Kern Co.; along the Santa Ana River, Riverside Co.; and along the Amargosa River, Inyo and San Bernardino counties. May nest along San Luis Rey River, San Diego Co.	Not Likely to Occur	Out of range. No CNDDB, eBird, or iNaturalist occurrence records within 10 miles.
Contopus cooperi	Olive-sided flycatcher	USFWS: BCC State: SSC	Montane coniferous forest with trees over water or open terrain including mixed conifer, montane-hardwood-conifer, Douglas-fir, red fir, and lodgepole pine. Occurs below 9000 ft throughout California exclusive of the deserts, the Central Valley, and other lowland valleys and basins.	High	Habitat present. Within range. Multiple eBird records in project area.
Cypseloides niger	black swift	CDFW: SSC Global Rank: G4 IUCN: VU State Rank: S2 USFWS: BCC	Nests in moist locations on sea cliffs above surf, or on cliff behind, or adjacent to, waterfalls in deep canyons, or caves. Transient over most terrain and habitat. Breeds in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mts., and in coastal bluffs and mountains from San Mateo Co. south probably to San Luis Obispo Co. Not typically found in arid regions, with exception of the Great Basin, southern deserts, and Central Valley. Does not winter in California.	Moderate	Potential transient in project area. Two eBird occurrence records within five miles. CNDDB and iNaturalist records over 10 miles.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

Dendroica nigrescens	Black-throated gray warbler	USFWS: BCC	Open stages of dry oak and other woodlands and forests with brushy understory including ponderosa pine, valley foothill hardwood-conifer, montane hardwood, and pinyon-juniper. Migrant of lowlands. Middle and higher-elevation conifer forests post-breeding. Winters in lowland woodlands or pine plantations, e.g., valley foothill riparian habitat in Sacramento Valley. Occurs throughout California, excluding most of Central Valley and deserts.	High	Habitat present. Within range. One eBird occurrence record in the project area. Multiple eBird occurrences within five miles, and iNaturalist records in the greater surround-ing area IPaC records within Shasta County.
Dendroica petechia brewsteri [Setophaga petechia]	Yellow warbler	State: SSC	Primarily in riparian thickets and trees such as willow, cottonwood, sycamore, ash, and alder. Near water, xeric montane shrub fields, and shrubby understory of mixed-conifer forest. Occurs along the coast range in Del Norte County, east to Modoc plateau, south along coast range to Santa Barbara and Ventura counties and along western slope of Sierra Nevada south to Kern County. Also breeds along eastern side of California from the Lake Tahoe area south through Inyo co, and southern California mountain ranges. Winters in Imperial and Colorado river valleys.	High	Habitat present. Within range. One eBird occurrence record in the project area. Multiple eBird occurrences within five miles, and iNaturalist records in the greater surrounding area. One Hatchet Ridge mortality record.
Eremophia alpestris actia	California horned lark	CA Rank: S4 Global Rank: G5T4Q IUCN: LC CDFW: WL	Coastal regions, chiefly from Sonoma County to San Diego County. Also, in main part of San Joaquin Valley and east to foothills. Short-grass prairie, “bald” hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	Moderate	Habitat Present. No CNDDB, iNaturalist, or ebird records within Shasta County.
Empidonax traillii	Willow flycatcher	CA Rank: S3 Global Rank: G5 State: SE IUCN: LC	Dense riparian willow thickets adjacent to wet meadows, ponds, or backwaters from 2,000–8,000 ft. elevation. Formerly abundant in suitable habitat throughout California; currently known from fewer than 100 sites in Central and Northern California.	Moderate	Marginal habitat present. Within range. No CNDDB, iNaturalist, or ebird records within 10 miles of the Project

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

					but known from Shasta County.
Gymnogyps californianus	California condor	Fed: FE CDFW: SE, FP	Nests in caves, crevices, behind rock slabs, or on large ledges on high sandstone cliffs; requires vast expanses of open savannah, grasslands, and foothill chaparral with cliffs, large trees and snags for roosting and nesting.	Not Likely to Occur	An experimental population of this species is currently being introduced on tribal lands along the coastal position of Northern California. May occur in the future should the reintroductions be successful.
Falco peregrinus anatum	American peregrine falcon	CA Rank: S3S4 CDFW: FP Fed: FD Global Rank: G4T4 State: SD	Nests and roosts on protected ledges of high cliffs, buildings, and bridges, usually adjacent to lakes, rivers, or marshes that support abundant avian prey. Breeds along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. Winters in Central Valley, and occasionally the Channel Islands.	Moderate	Marginal habitat present. Within range. Two historical CNDDB occurrence records within five miles, and two in the surrounding area.
Haliaeetus leucocephalus	Bald eagle	CA Rank: S3 CDFW: FP Fed: FD Global Rank: G5 State: SE	Large trees near lakes, reservoirs, and large rivers with abundant prey. Wintering birds most often near large concentrations of waterfowl or fish. Occurs in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties. And The Klamath Basin. More common at lower elevations, such as Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and the Colorado River	Present	Habitat present. Observed during surveys. Multiple CNDDB and eBird records within 5 miles of Project Area. Multiple CNDDB, eBird, and iNaturalist records within the surrounding area. Known transient.
Icteria virens	Yellow-breasted chat	CDFW: SSC IUCN:LC	Occupy early successional riparian habitats with a well-developed shrub layer and an open canopy. Vegetation structure, however, more than age appears to be the important factor in nest-site	Present	Habitat present. Observed during surveys. Known from

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			selection. Nesting habitat is usually restricted to the narrow border of streams, creeks, sloughs, and rivers and seldom forms extensive tracts. (Shuford and Gardali, 2008). Willow thickets and other thick riparian vegetation, including blackberry and wild grape, near water courses.		Shasta County at lower elevations.
Laterallus jamaicensis coturniculus	California black rail	CA Rank: S1 CDFW: FP Global Rank: G3T1 IUCN: EN State: ST	Tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass. Vicinity of tidal sloughs high wetland zones near upper limit of tidal flooding. Occurs in the San Francisco Bay area, Sacramento-San Joaquin Delta, coastal southern California at Morro Bay and a few other locations, the Salton Sea, and lower Colorado River area	Not Likely to Occur	No habitat present. One CNDDB occurrence record within five miles along Montgomery Creek. No other records on CNDDB, eBird, iNaturalist within the surrounding area.
Melanerpes lewis	Lewis's Woodpecker	USFWS: BCC	Open oak savannahs, broken deciduous, and coniferous habitats. Winter resident occurring along eastern slopes of the Coast Ranges south to San Luis Obispo Co, Central Valley, Modoc Plateau, and the Transverse and other ranges in southern California. Breeds along eastern slopes of the Coast Ranges, and in the Sierra Nevada, Warner Mts., Klamath Mts., and Cascade Range.	Present	Habitat present. Observed during surveys. Within range. One eBird occurrence record within the project area. Multiple eBird records within five miles. Multiple iNaturalist records within the surrounding area.
Pandion haliaetus	Osprey	CA Rank: S4 CDF: S CDFW: WL Global Rank: G5 IUCN: LC	Associated strictly with large, fish-bearing waters, primarily in ponderosa pine through mixed conifer habitats. Breeds in northern California from Cascade Ranges south to Lake Tahoe, and the coast south to Marin Co. Including Shasta Lake, Eagle Lake, Lake Almanor, other inland lakes and reservoirs, and	High	Marginal habitat present. Within range. Multiple eBird occurrence records within the project area. CNDDB, eBird, and iNaturalist

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			northwest river systems. Uncommon along southern Colorado River, and coast of southern California.		records within five miles.
Pelecanus erythrorhynchos	American White Pelican	CDFW: SSC USFWS: BCC	Large freshwater and saltwater lakes, usually on small islands or remote dikes. Nest-sites are flat or gently sloping, lacking shrubs or other obstructions, free of human disturbance, and usually with loose earth suitable for nest-mounds. Occurs in Klamath Basin, especially Clear Lake National Wildlife Refuge, as well as Honey Lake, Central Valley, Salton Sea, salt ponds of San Francisco Bay, coastal slopes of Sonoma Co., Central Valley, and Lake Tahoe. Migrant over most of California.	High	No habitat present. Within range. Multiple eBird records within five miles. Occurs as migrant. Detected by the applicant.
Phalacrocorax auritus	Double-crested cormorant	IUCN: LC CDFW: SSC	Entire coast of California and on inland lakes, in fresh, salt and estuarine waters. Uncommon in marine subtidal habitats from San Luis Obispo Co. Occurs at the Salton Sea and Colorado River reservoirs. Rare to fairly common in lacustrine and riverine habitats of the Central Valley and coastal slope lowlands.	Low	No habitat present. Outside of range. Two eBird occurrence records within five miles. Multiple eBird and iNaturalist occurrences in the surrounding area. Potential transient.
Progne subis	Purple martin	CA Rank: S3 Global Rank: G5 CDFW: SSC	Summer resident of valley foothill and montane hardwood, conifer, riparian, wooded residential, and other habitats, using cavities, sometimes human structures, often near water. Breeding rare in the south, coast, inland to Modoc and Lassen Co's, in interior mountain ranges. Rare to absent from higher desert regions and slopes of the Sierra Nevada.	Moderate	Marginal habitat and range. Three eBird occurrence records within five and ten miles. CNDDB and iNaturalist records over ten miles.
Riparia riparia	Bank swallow	CA Rank: S2 Global Rank: G5 IUCN: LC CDFW: ST	Uses riparian, lacustrine and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. Forages over riparian, brushland, grassland, wetland, water and agricultural habitats. Uses	Not Likely to Occur	No habitat present. Outside of range. No CNDDB, eBird, or iNaturalist occurrence

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			open habitats with other swallow species during migration. Lowland habitats in California west of the deserts. Migrates along the interior, less common on coast and during Summer.		records within ten miles.
Selasphorus rufus	Rufous hummingbird	USFWS: BCC	Trees and shrubs in many habitats provide cover, including lowland riparian, open woodlands, scrub, and chaparral, also mountain meadows extending to and above tree line. Common migrant and uncommon summer resident throughout California.	High	Habitat present. Potential transient. One eBird occurrence record in project area. Multiple eBird records within five and ten miles.
Setophaga petechia	Yellow Warbler	CDFW: SSC	Riparian plant associations; prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging.	High	Habitat present. Potential transient. Numerous iNaturalist records in Shasta County.
Strix occidentalis caurina	Northern spotted owl and critical habitat	Fed: FT CDFW: ST	High, multistory canopies with large trees, abundance of cavities, woody debris, snags, and open space below the canopy, in old-growth forests or stands with a mix of old growth and mature trees. Douglas-fir, redwood, pine, oak, fir, and other trees used for nesting. Northern California, as far south as Marin County. CDFW considers the Pit River area of Shasta County, the southeastern boundary of its range.	Moderate but considered absent in this area for management purposes.	Marginal old growth habitat present but could occur in adjacent forest lands. Considered out of the species range.
Strix occidentalis occidentalis	California spotted owl	CA Rank: S2 Global Rank: G3G4T2T3 CDFW: SSC USFWS: BCC	Subspecies of spotted owl that occurs throughout the Sierra Nevada mtn range in CA and NV, in southern and coastal CA in the Coastal, Trans-verse, and Peninsular mtn ranges; and in Sierra San Pedro Martir in Baja California Norte, Mexico. Inhabit older forests that contain structural char-acteristics necessary for nesting, roosting, and foraging. In the Sierra Nevada range, a majority occur within mid-elevation ponderosa pine, mixed conifer, white fir, and mixed-evergreen forest types, with fewer owls occurring in the	Present	iNaturalist and CNDDB record within 5 miles of project site. Detected in the project area by the applicant. Likely nests in adjacent forest lands.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			lower elevation oak woodlands of the western foothills. On the central coast and southern CA, found in riparian /hardwood forests and wood-lands, live oak/big cone fir forests, and redwood/ CA laurel forests. Nests are typically found in areas of high canopy cover, a high number of large trees, and downed trees. Mostly found on lands managed by the USFS and NPS. (USFWS Species Accounts)		
Strix nebulosa	Great gray owl	CDFW: SE	Resident in higher elevations (4500-7500ft) conifer woodlands, breeds in old growth red fir, mixed conifer or lodgepole pine, always in vicinity of wet meadows. Nests and roosts in dense coniferous forest.	Low	Marginal habitat pre-sent on project site but could occur in ad-jacent forests. Likely present as a migrant.
MAMMALS					
Antrozous pallidus	Pallid bat	CA Rank: S3 Global Rank: G4IUCN: LC CDFW: SSC	From low-elevation rocky, arid deserts, canyon lands, and shrub-steppe grasslands to higher-elevation conifer forests. Most abundant in xeric ecosystems. Day/night roosts in caves, mines, tree hollows, oak boles, exfoliating bark, and crevices in rocky outcrops and cliffs, as well as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings. Occurs throughout California except for high Sierra Nevada from Shasta to Kern counties, and the northwestern corner of California from Del Norte and western Siskiyou counties. to northern Mendocino Co. (Hermanson and O'Shea 1983, WBWG 2017), They rank as moderate, No CNDDB records within 10 miles of project site.	Moderate	Habitat present. No CNDDB or iNaturalist records within 10 miles of project site. Known from the Hat Creek area. Likely present as a migrant.
Aplodontia rufa ssp. californica	Sierra Nevada mountain beaver	CA Rank: S2S3 Global Rank: G6T3T4 IUCN: LC CDFW: SSC	Found throughout the Cascade, Klamath, and Sierra Nevada Ranges. Distribution often is scattered; populations local and uncommon in the Sierra Nevada and other interior areas.	Low	Habitat present. CNDDB records over 10 miles SW of project site. No iNaturalist records found in Shasta

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			Mountain beavers occur in dense riparian-deciduous and open, brushy stages of most forest types. Typical habitat in the Sierra Nevada is montane riparian; in the Coast Ranges, most populations occur below 900 m (2700 ft) (Borrecco and Anderson 1980). Frequent open and intermediate-canopy coverage with a dense understory near water. Deep, friable soils are required for burrowing, along with a cool, moist microclimate.		County. Very scattered occurrences.
Bassariscus astutus	Ringtail	State: FP	Rocky outcrops, canyons, or talus slopes in deserts, chaparral; woodlands of oak, pinyon pine, and juniper; montane conifer forests; and especially riparian for the abundant prey. From sea level up to 9,500 ft. (2,900 m) but most common below 4,600 ft. Nest in rock recesses, logs, tree hollows, and man-made enclosures. Range is not well known. Potentially occurs throughout California where habitat is present.	Moderate	Habitat present. Numerous iNaturalist occurrence in Shasta County. No recorded animals within10 miles.
Canis lupus	Gray wolf	Fed: FE	Habitat generalists; historically occupied diverse habitats including tundra, forests, grasslands, and deserts. Primary habitat requirements include adequate ungulate prey and water. Wolves occur primarily where human contact is relatively low and prey abundance is adequate. Individuals documented throughout Northern California.	High	Habitat present. IPaC records within Shasta County. Possible track identified by the applicant on the Project site. iNaturalist record near Burney.
Corynorhinus townsendii	Townsend's big-eared bat	CDFW: SSC Global Rank: G4 IUCN: LC State Rank: S2	Habitat associations include conifer forests, deserts, grasslands, riparian, coastal habitats, active agriculture; most commonly found in mesic sites from sea level to 10,800 ft. Roosts on walls and ceilings of caves and mines, also buildings, bridges, rock crevices, and hollow trees; roosting sites are limiting to success and presence. Sensitive to human disturbance.	Moderate	Habitat present. Nearest occurrence on CNDDB over 10 miles west at Shasta Lake. Likely occur as migrants.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			Uncommon in California but may occur where habitat is present.		
Erethizon dorsatum	North American porcupine	CA Rank: S3 Global Rank: G5 IUCN: LC	Dens in caves, crevices in rocks, cliffs, hollow logs, snags, burrows of other animals; will use dense foliage in trees if other sites are unavailable. Found throughout the Sierra Nevada and Cascades from Kern Co. north to the Oregon border, south in the Coast Ranges to Sonoma Co., and from San Mateo Co. south to Los Angeles Co. Scattered populations in eastern Central Valley, and Los Angeles and San Bernardino counties.	Low	Habitat present. Nearest occurrence on CNDDB within five miles, two other occurrences within ten miles.
Euderma maculatum	Spotted bat	CA Rank: S3 CDFW: SSC Global Rank: G4 IUCN: LC	Roosts in rock crevices. Occasionally found in caves and buildings. Cliffs provide optimal roosting habitat. Arid deserts, grasslands and mixed conifer forests. Elevational range extends from below sea level in California to above 10,000 ft in New Mexico. Found mostly in the foothills, mountains and desert regions of southern California.	Moderate	Habitat present. Nearest occurrence record on CNDDB over ten miles west. Likely overflies the site.
Eumops perotis californicus	Western mastiff bat	CA Rank: S3S4 Global Rank: G4G5T4 CDFW: SSC	Roosts primarily in deep, narrow rock crevices of cliff faces (exfoliating granite, columnar basalt); may also use crevices in buildings. Distribution limited by presence of significant rock features for roosting in desert scrub, chaparral, oak woodland, ponderosa pine belt, and high-elevation meadows of mixed conifer forests. More widespread than previously believed; known from eastern Trinity Alps.	Present	Habitat present. Detected during surveys. No CNDDB or iNaturalist results within 10 miles of the project area. Likely overflies the site.
Gulo gulo	California wolverine	CA Rank: S1 CDFW: FP Fed: FT – Prop. Global Rank: G4 IUCN: S State: ST	Caves, hollows in cliffs, logs, rock outcrops, and burrows for cover, generally in denser forest stages. Prefer areas with low human disturbance. Occurrences range from Del Norte and Trinity counties. east through Siskiyou and Shasta counties., and south through Tulare Co. May occur in high elevation habitats on the north	Low	Habitat present. Within range. One historical CNDDB occurrence record in project area, and multiple within ten miles.

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

			coast region as far south as Lake Co and Sierra Nevada.		
Lasionycteris noctivagans	silver-haired bat	CA Rank: S3S4 Global Rank: G3G4 IUCN: LC	Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark. Primarily a forest dweller, feeding over streams, ponds, and open brushy area. Found throughout California; area is dependent upon season.	High	Habitat present. Two historical CNDDB occurrence records in project area, and two within ten miles. One iNaturalist record over ten miles east. Four Hatchet Ridge mortality records. Likely occurs as migrant.
Lasiurus blossevillii	Western red bat	CA Rank: S3Global Rank: G4IUCN: LCCDFW: SSC	Typically solitary, prefers riparian. Roosts primarily in shrub and tree foliage, especially cottonwood-willow, mostly in edge habitats adjacent to streams or open fields but also orchards, sometimes urban areas. May occasionally use caves. Considered present throughout California.,	Moderate	Habitat present. No CNDDB or iNaturalist records within 10 miles of project site. Likely occurs as migrant.
Lepus americanus klamathensis	Oregon snowshoe hare	CA Rank: S2 Global Rank: G5T3T4Q CDFW: SSC	Middle and higher elevations near montane riparian vegetation, in young or dense stands of firs, lodgepole pines, and subalpine forests, and in chaparral. Known from Klamath Mountains.	Moderate	Habitat present. CNDDB record over 10 miles west. No iNaturalist record within 10 miles.
Martes caurina sierrae	Sierra marten	CA Rank: S3 Global Rank: G4G5T3	Prefers denning and nesting in old-growth conifers and snags. Can be found in ed fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine, and chaparral woodlands with dense canopy cover. Permanent resident of North Coast regions and Sierra Nevada, Klamath, and Cascades Mts	Low	Habitat present. Within range. CNDDB and INaturalist records over ten miles.
Pekania (= Martes) pennanti	Fisher	BLM: S CA Rank: S2S3 CDFW: SSC Global Rank: G5	Prefer mature or late-successional forests with dense canopy closure, multiple canopy layers, high structural complexity, and large-diameter live and dead trees and downfall with cavities	High	Habitat present. Within range. Multiple CNDDB occurrence

TABLE 5.2-4 KNOWN AND POTENTIAL OCCURRENCE OF SPECIAL-STATUS WILDLIFE WITHIN THE PROJECT AREA

		IUCN: LC	and deformities. Forest type is less important than forest structure and abundant prey. Uncommon permanent resident of the Sierra Nevada, Cascades, and Klamath Mts.; also found in a few areas in the North Coast Ranges		records in the project area.
Taxidea taxus	American badger	CA Rank: S3 CDFW: SSC Global Rank: G5 IUCN: LC	Semi-fossorial mammal found most often in drier, open stages of shrubland, forest, and herbaceous habitats with friable soils and rodent prey. From sea level to high alpine meadows. Widely distributed in California. Uncommon, permanent resident found throughout most of the state, except on the northern North Coast area	Low	Marginal habitat present. Within range. One CNDDB occurrence record within five and ten miles.
Vulpes vulpes necator pop. 1	Sierra Nevada red fox Southern Cascades DPS	CA Rank: S1 Global Rank: G5TNR State: ST	Prefers forests interspersed with meadows or alpine fell-fields, found in a variety of montane habitats. Uses dense vegetation and rocky areas for cover and den sites, dens located in rocky outcrops, hollow logs and stumps, subterranean burrows. (CDFW page)	Low	Habitat present. CNDDB records over 10 miles west.

1 - Conservation Status

Federal designations: (federal Endangered Species Act, U.S. Fish and Wildlife Service).
FE: Federally listed, endangered
FT: Federally listed, threatened
FD: Federally delisted
–PRO: Proposed for listing
–CAN: Candidate for listing

State (California) designations: (California Endangered Species Act, California Department of Fish and Wildlife (CDFW))
SE: State listed, endangered
ST: State listed, threatened
SC: State candidate for listing, endangered or threatened
SD: State delisted
SSC: CDFW California Species of Special Concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: CDFW Fully Protected species. May not be taken or possessed without permit from CDFW.

2 - Definitions of occurrence probability: Estimated occurrence probabilities based on literature sources cited earlier and 2020 habitat assessment and habitat analyses reported here.

Present: Taxon was observed within the Project Area during 2020 habitat assessment or is assumed present due to existing data and suitable habitat conditions.

High: Both a documented recent record (within 20 years) exists of the taxon within the Project Area or in the Study Area (approximately 5 miles) and the environmental conditions (including soil type) associated with taxon are present.

Moderate: Both a documented recent record (within 20 years) exists of the taxon within the Project Area or in the Study Area (approximately 5 miles) and the environmental conditions associated with taxon presence are marginal or limited within the Project Area and the Project Area is located within the known current distribution of the taxon and the environmental conditions (including soil type) associated with taxon are present.

Low: A historical record (over 20 years) exists of the taxon within the Project Area or in the general region (approximately 10 miles) and the environmental conditions (including soil type) associated with taxon are present but marginal or limited.

Invertebrates

The CNDDB query for the project site and vicinity identified five federally listed invertebrate species in the region (CDFW, 2024e). These species were evaluated for potential to occur in the project site. Three of the species, Conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*) are specialized for Central Valley vernal pool habitats, which are not present on the project site. Shasta crayfish (*Pacifastacus fortis*) has been identified only in the Fall River and Hat Creek subdrainages of the Pit River system upstream of the project site drainages in clear gravel shallows. It has low potential to occur in the project site based on habitat conditions. Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is found in association with blue elderberry (Sambucus mexicanus) in the Central Valley, south and east of the project site. Elderberry shrubs have not been found in the project site and the valley elderberry longhorn beetle is not likely to occur.

Western bumble bee (*Bombus occidentalis occidentalis*). The western bumble bee is a USFS sensitive species and state candidate endangered (CDFW, 2024b). Meadows and grasslands with abundant flowers are the best habitat for this generalist forager. This bee is an essential pollinator of native plants and crops. Western bumble bee nests are primarily in underground cavities such as old squirrel or other animal burrows on open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties (Xerces Society et al., 2018). Threats include modification or destruction of its habitat, overexploitation, competition, disease and other natural events, pesticide use, global climate change, and, potentially, reduced rodent abundance. Previously widespread throughout North America, it is largely restricted to high-elevation sites in the Sierra Nevada with a small number of records from the Northern California coast. It is documented historically in Shasta County (Xerces Society, 2024a). Nine CNDDB records of western bumble bees occur within 5 miles of the project area (CDFW, 2024e).

Crotch's Bumble Bee (*Bombus crotchii*). The Crotch bumble bee is a candidate for listing under the California Endangered Species Act (CESA). Little is known about specific habitat requirements of the species as they can be found in a variety of vegetation communities including grassland, scrub, chaparral, desert, and woodlands. Suitable habitats include grasslands and shrub communities that provide native floral resources. Crotch bumble bees can persist in semi-natural habitats surrounded by intensely human modified landscapes (Love, 2010). The species has been documented at a wide range of elevations ranging from -120 feet below mean sea level to 8,500 feet above mean sea level (CDFW, 2023b). Crotch bumble bee queens emerge from hibernation and disperse to find a nest site between February-April depending on climatic conditions (Goulson, 2010). Queens may disperse between 1.6 and 6.2 miles from the colony of origin (Hatfield et al., 2015). This species frequently nests underground in abandoned rodent burrows but may also be found above ground utilizing tufts of grass, bird nests, rock piles, or cavities in dead trees.

Bumble bees are threatened by a variety of factors including pesticide use, pathogens from managed pollinators, and competition with non-native bees (Hatfield et al., 2015). Crotch bumble bee preference of California native plants for foraging and natural habitats for nesting and over-wintering makes them more sensitive to the threats posed by habitat loss and climate change, resulting in a shrinking occurrence range (Hatfield et al., 2015).

Intense agriculture in the northern Central Valley and rapid urbanization in the southern Central Valley and throughout southern California are the primary threats that may have impacted Crotch bumble bees and have result in a loss suitable foraging habitat (Hatfield et al., 2015). Climate change, specifically increasing aridity, is an additional threat; as Crotch bumble bees have a narrow climatic specialization compared to most bumble bees (Hatfield et al., 2015).

The current and historic range includes the southwestern part of Shasta County. The project site is outside of this range. There are no nearby CNDDB or iNaturalist occurrences however this species has been detected in similar habitats south of the project on the Lassen National Forest. The nearest CNDDB record is in Red Bluff, CA which is over 40 miles south of the project area (CDFW, 2024e).

Monarch butterfly (*Danaus plexippus*). The USFWS announced on December 15, 2020, that listing the monarch butterfly as endangered or threatened under the ESA is warranted but precluded by higher priority listing actions. Despite that decision, the species is now a candidate for federal listing and its status will be reviewed annually by USFWS until a listing decision is determined.

Monarch butterflies occur globally; however, the subspecies that inhabits North America is imperiled. This includes the larger eastern population and the smaller western population. In California, western monarchs rely on the moderate temperatures and varied landscape for reproduction and breeding during the spring and fall migrations to coastal overwintering sites. In the spring, adult butterflies begin to move inland, feeding on flower nectar and mating and laying eggs on a variety of milkweed plants, the sole source of food for monarch caterpillars. These individuals then die, leaving their offspring to repeat the cycle. Several generations later, the last adults produced in late summer/fall migrate to the coast of California to survive the winter in groves of trees that provide the appropriate conditions. This species is known from Shasta County and the site is in the larger migratory pathway for this species.

Wawona riffle beetle (*Atractelmis wawona*). This species is located in southern Oregon, Idaho, and northern California. This beetle was present in the middle fork of the Cottonwood Creek in Shasta County in 1952. Habitat consists of mountain streams that contain large quantities of moss (Shepard and Barr, 1991).

Oregon shoulderband (*Helminthoglypta hertleini*). This species can be found from southwestern Oregon to Siskiyou, Shasta, and Tehama counties. Habitat is generally rocky or woody areas within forests. They area also associated with talus

deposits/outcrops, subsurface water, and herbaceous vegetation. Individuals are hermaphroditic but not much is known about the reproductive cycle (Jordan and Black, 2015).

Shasta chaparral (*Trilobopsis roperi*). This species is endemic to Shasta County. Habitat requirements include moist, shaded areas located in forests. Diet consists of leaf and needle litter and fungi (NatureServe, 2024). This species could occur.

Western ridged mussel (*Gonidea angulate*). This species can be found in California, Oregon, Washington, Idaho, Nevada and British Columbia. Habitat consists of sand and silt substrate in permanent bodies of water. They prefer moving water with low gradient but not turbid. The parasitic larvae are usually found on host fish during March through August. Host species can include minnows, sculpin, trout, and sunfish families (USFWS, 2024a). This species could occur.

Western pearlshell (*Margaritifera falcata*). This species can be found throughout North America including pacific northwest, Wyoming, Utah and Montana. Habitat consists of flowing water and gravel and cobble substrates in permanent bodies of water (USFWS, 2024b). The parasitic larvae require salmonoid species as hosts therefore their range is limited to waterbodies containing salmonoids. After the juvenile mussel detached from the host, it will settle to the ground. This creature is a filter feeder, consuming plankton, bacteria, and other organic matter. This species has a very low potential to occur.

Shasta Hesperian (*Vespericola shasta*). This species is endemic to Klamath Province with a majority of records being within Shasta County. There have been occurrences at Brock Creek (east Shasta Lake) and Burney Creek just south of Burney Falls. Habitat consists of moist areas such as perennial riparian zones, springs, seeps, and marshes (USFWS, 2015). Areas containing limestone may be preferred. This species can be found up to 915 meters in elevation. This species could occur.

Fish

The Site Characterization Study for the project site (FWPA, TN 248318) examined USFWS and CNDDB species lists and evaluated the available habitat on site. Special-status fish including bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha*) spring and winter run, and Central Valley DPS steelhead (*Oncorhynchus mykiss irideus*), McCloud River redband trout (*Oncorhynchus mykiss* ssp. *2*), bigeye marbled sculpin (*Cottus klamathensis macrops*), hardhead (*Mylopharodon conocephalus*), and Pacific lamprey (*Entosphenus tridentatus*) were found to have no potential to occur. These species typically require large stream and river systems with deep, cold, flowing water.

Pit roach (*Lavinia symmetricus mitrulus*), a CDFW SSC, has a potential to occur within the project site. Pit roach inhabit both deep pools and areas of low flow, moderate gradients, warm temperatures, and mats of vegetation. There is one CNDDB occurrence

of Pit roach 2.7 miles north of the project site, within the Pit River and tributaries (CDFW, 2024e). Most of the channels within the project site have low potential to support this species. Except for the few perennial streams hydrological conditions for surface waters tend to be flashy in the winter months and dry in the summer depending on snow melt and winter rains. However, it is possible pit roach occur in some of the perennial and intermittent drainages.

Reptiles

Western Pond Turtle (*Emys marmorata*). The western or northwestern pond turtle is a CDFW SSC (CDFW, 2024b), and was proposed for federal listing as threatened on September 29, 2023 (USFWS, 2023e). It occurs in perennial waters such as lakes, ponds, rivers, streams, irrigation ditches, and sloughs with aquatic vegetation, deep or muddy water for cover, and sunny openings (Jennings and Hayes, 1994). It needs basking sites for thermoregulation, such as logs, vegetation mats, open banks, or rock outcrops adjacent to deep water for escape. Although primarily aquatic, pond turtles leave aquatic habitats to mate, and some overwinter in uplands (Jennings and Hayes, 1994; Holland, 1991). Suitable upland habitat for egg-laying includes unshaded sandy banks or grassy, open fields on unshaded, south-facing slopes with generally less than 25 percent slope. Nests are typically within 650 feet (200 m) of aquatic habitats. This turtle occurs in suitable habitats throughout California (Jennings and Hayes, 1994).

There are suitable streams and small ponds in the project area that could support this species. This species has not been detected by the Applicant however, the surveys are over five years old and there is a CNDDB occurrence from 2004 just outside of the southwestern boundary of the site (CDFW, 2024e). This species has a moderate potential to occur within the project site.

Amphibians

Shasta Salamander (*Hydromantes shastae*). Shasta salamander is a state-listed threatened species (CDFW, 2024b). This species is not common, with distribution being comprised of numerous, isolated populations near valley-foothill limestone regions of Shasta County. Preferred habitat includes hardwood conifer, ponderosa pine, and mixed-conifer habitat typically found from 1,100 to 2,550 feet (335 to 777 meters). This species is most active during wet seasons and retreat to limestone fissures and caves during dry seasons. Logs and talus are often used for cover. The project site is outside of the known range of this species which appears to be limited to the vicinity of Shasta Reservoir. While there does not appear to be suitable habitat within the project site there is a record of this species 5 miles to the west. This species is not expected to occur.

Coastal Tailed Frog (*Ascaphus truei*). The Coastal tailed frog is a California SSC. Habitat is restricted to montane areas of hardwood-conifer, redwood, Douglas-fir, and ponderosa pine with perennial streams. There is habitat for this species within the

project site and the species has been documented near the center of the project site. This species has a high potential to occur within the project site.

Southern Long-Toed Salamander (*Ambystoma macrodactylum sigillatum*). The Southern long-toed salamander is a California SSC. It is typically found in montane meadows and lakes at high elevation. It is found within the Sierra Nevada, Cascade, and Klamath mountains. This species has moderate potential to occur within the project, as montane meadow habitat is present within the project site in burned areas and areas cleared by logging.

Foothill Yellow-Legged Frog (*Rana boylii*). The foothill yellow-legged frog is a CDFW SSC (CDFW, 2024b). The federal listing of distinct population segments (DPS) of foothill yellow-legged frog does not include the project area. Foothill yellow-legged frogs are found in or near rocky streams in a variety of woodland, scrub, and meadow habitats. They require shallow, flowing water in small to moderate streams with some cobble-sized substrate. While they have also been found in streams lacking a cobble or larger-sized substrate (Fitch, 1938), it is not known if these habitats are regularly used (Hayes and Jennings, 1988). They require sunny and partly shaded banks for basking. Adults are usually found near water and prefer riffle or cascade/pool areas with rocky banks. Breeding sites are typically in mainstem creeks and rivers near tributary confluences because tributaries, while generally poor for breeding, are relatively advantageous for overwintering (Kupferberg, 1996). Successful breeding sites are channels with high width-to-depth ratios, with the presence of cobble, small boulders, and emergent rocks. During periods of inactivity, especially during cold weather, individuals seek cover under rocks in streams or on shore within a few meters of water. This frog has disappeared from more than half of its historically occupied locations throughout Oregon and California (CBD, 2017a). The largest populations are now in northwest California (CBD, 2017a).

Project-specific visual encounter surveys in 2018 and eDNA surveys in 2019 did not detect this species (FWPA, TN 248305-2; FWPA, TN 248305-4; FWPA, TN 248308-2). However, there is one old record in the vicinity of the project area and suitable habitat is present. Staff considers this species to have a moderate potential to occur.

Cascades Frog (*Rana cascadae*). The Cascades frog is listed as state endangered under CESA and is a CDFW SSC (CDFW, 2024b). In northwestern California, the Cascades frog currently occurs in mountainous areas of the Klamath Mountains at elevations ranging from 750 to 8,200 feet (230–2500 m) (Jennings and Hayes, 1994). Cascades frogs are found mostly in lakes, ponds, wet meadows, and streams, depending on life stage and season (Pope et al., 2014). Breeding sites are typically in shallow, still-water habitats formed by snowmelt early in the spring that will last 3 to 4 months through the developmental period of tadpoles (Pope et al., 2014). Breeding habitats include shallow alcoves of lakes, ponds, potholes, flooded meadows, and sometimes slow-moving streams. Nonbreeding adults can occupy a greater variety of aquatic habitats, often with open, sunny areas along shorelines that allow for basking

and foraging (Garwood, 2009; Pope et al., 2011). Adults are generally closely associated with water and maintain site fidelity, in which adults will move among unique breeding, feeding, and overwintering habitats with an annual pattern (Garwood, 2009; Pope et al., 2014). During periods of inactivity, this frog hibernates in mud at the bottoms of ponds, spring-water saturated ground, and other aquatic sites (Briggs, 1987; Pope et al., 2014).

The known current range of this species overlaps only a small area in the southern portion of the project area. However, the species has been documented 1.2 miles southeast of the project area. Although limited habitat is present staff considers the species to have a low to moderate potential to occur.

California Red-Legged Frog (*Rana draytonii*). California red-legged frog is protected under the FESA (1973) as a threatened species (USFWS, 2024c). California red-legged frog range includes the coast ranges south from Mendocino County and includes part of the Cascades and Sierra Nevada. They are typically found in lowlands or foothills below 3,900 feet (1,200 meters). Their preferred habitat is shoreline near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. They also inhabit marshes, calm pools along streams, and ponds. California red-legged frog require year-round pools for larval development. The project area is at the northern extent of the frog's known range, and there may be suitable habitat within the project area. However, this species is rare in the region and there have been no documented occurrences within Shasta County or the project site during site biological surveys. It is unlikely that this species is present on the project site.

Birds

Northern (*Strix occidentalis caurina*) and California Spotted Owl (*Strix occidentalis occidentalis*). The northern spotted owl is federally listed as threatened and prefers mature coniferous forests and multi-layered mixed conifer forests. However, this species is not considered present in the project area, since this northern subspecies, for management purposes, is considered only to occur north of the Pit River. The Pit River is approximately 4.7 miles north of the project site.

The California spotted owl is a California SSC (CDFW, 2024b). In northern California, this species is associated with dense, old-growth, multi- layered mixed-conifer, redwood, and Douglas fir forests. The California spotted owl was recently petitioned for listing at the federal level, the listing was found not warranted in 2019. It is currently subject to a new petition to list. In their assessment, the USFWS found that the primary threats to the California spotted owl are large-scale, high-severity fire, increased tree mortality, drought, effects of climate change, and competition with the barred owl invasion (USFWS 2019a).

Suitable nesting/roosting habitat for California spotted owl includes areas of complex-structured/multi-layered forest, high canopy cover, and the presence of old and decadent trees, large snags, and coarse downed woody debris (Gutiérrez et al., 2017).

The California spotted owl forages in forested habitats that are generally similar to nesting and roosting habitat. The California spotted owl tends to avoid crossing brushy and clearcut forest areas, although they may hunt along forest edges. Their core areas may range from 300 to 2,000 acres.

The project site is located at edge of the geographic range of the California spotted owl and high-quality nesting/roosting habitat is limited present within the project area. Suitable habitat is present near the southern borer of the project in and near the LNF. California spotted owls were detected near the southern border of the project near the LNF during focused surveys conducted by the Applicant in 2023 (FWPA, TN 253168). No active nest sites or activity centers occur within 0.25 miles of any proposed disturbance areas.

The Fountain Fire, which burned much of the central half of the project site in 1992, has resulted in a limited the amount of nesting habitat for some forest-nesting species, but may be suitable for species preferring more open forest and scrub habitats (i.e., early seral) for nesting such as the American kestrel, red-tailed hawk, great horned owl, and western screech-owl. However, it is possible that the California spotted owl may forage within or disperse through project site and there are historical records of occurrence in the project site (CDFW, 2024b). California spotted owl have been documented in the vicinity of the project site (CDFW, 2024b). Three historical activity centers are located within 2.0 miles southeast of the project site and one historical activity center was located near the center of the project site (FWPA, TN253168).

Since the project site is located in proximity to much larger contiguous areas of high suitability habitat on the Shasta Trinity National Forest to the north and west and the Lassen National Forest to the southeast, California spotted owl may be less likely to select the more fragmented and less suitable habitats within the heavily managed timberlands present within the project site. However, loss of habitat region wide from wildfires may force owls to nest or forage in lower quality habitat.

Cooper's Hawk (*Accipiter cooperii*). The Cooper's hawk is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008. The Cooper's hawk is widespread, occurring throughout much of the United States, southern Canada, and northern Mexico. In California this species is a widespread but infrequent breeder but is not considered common at any location. In California, this species nests predominately in oaks and pines. Cooper's hawks utilize a variety of habitat types with vegetative cover and often hunt on the edges of wooded areas. This species high potential to occur in the project area.

Sharp-shinned Hawk (*Accipiter striatus*). The sharp-shinned hawk is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008. This species breeds from central and western Alaska and the greater portion of Canada south to central and south-central California, central Arizona, New Mexico, Texas, northern parts of the Gulf states, and into Mexico (AOS). In California, sharp-shinned

hawks breed throughout the state, including the northern half of the state, and, to a lesser extent, the mountains of southern California (Small, 1994).

This species typically nests in coniferous forests, often within riparian areas or on north-facing slopes (Stephenson and Calcarone, 1999). Where conifers are scarce, cottonwoods, poplars, and other tall riparian trees may be used for nest sites (Bent, 1937). Foraging habitat during the breeding season is essentially the same as that chosen for nesting. The primary threat to this species is the loss of suitable habitat because of large stand-replacing fires. This species was observed during avian surveys.

Great Blue Heron (*Ardea Herodias*). The great blue heron is a CDFW Special Animal. This taxon is not federally, or State listed as threatened or endangered. This species is common all year throughout most of California. Great blue herons are commonly found in shallow estuaries and fresh or saline emergent wetlands. However, they also can occur along riverine and rocky marine shores, in croplands, pastures, and in mountains above foothills. Few rookeries are found in southern California, but many are scattered throughout northern California. Breeding territories are small, usually including only the nest site and immediately surrounding areas (Cottrille and Cottrille, 1958; Mock, 1976). Secluded groves of tall trees near shallow water are preferred for nesting sites. This species is expected as a migrant and has a moderate potential to occur.

Black Swift (*Cypseloides niger*). This species breeds throughout western north America. There are approximately 200 pairs across 40-45 breeding sites throughout California. Nesting in California occurs June through August in Santa Cruz and the Sierras. MacArthur-Burney Falls is a potential breeding site in Shasta County. The black swift does not winter in California. Nests located in or near permanent or semipermanent waterfalls, perpendicular cliffs near water, or in sea caves (Legg 1956, Knorr 1993r. Nests are built with mud, moss, and sometimes seaweed (Bent 1940). Their diet is consisted of flying insects. This species will forage over almost any terrain as long as nesting parameters are met.

American White Pelican (*Pelecanus erythrorhynchos*). The American white pelican is a CDFW SSC. American white pelican breeds primarily in the interior of North America and winters on the Pacific coast. Within California, it breeds mainly in the Klamath Basin. Nesting usually occurs on loose substrate, which can be created into nest mounds, such as earthen, sandy, and rocky islands. Foraging, often in flocks, occurs in shallow inland waters. Foraging habitats include open areas in marshes, along lakes or rivers, and shallow coastal marine areas. Occasionally they will forage in deeper waters when fish are near the surface. This species was observed overflying the site.

American Peregrine Falcon (*Falco peregriunus anatum*). American peregrine falcon is a CDFW fully protected species. In California, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of the state. Active nests

have been documented along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. As a transient species, the American peregrine falcon may occur almost anywhere that suitable habitat is present. This species breeds in woodland, forest, and coastal habitats. Breeding season occurs from early March to late August. Breeding locations include wetlands, lakes, or rivers on high cliff, banks, or dunes. Other important habitats, during nonbreeding, include riparian areas and coastal and inland wetlands. This species will nest on human-made structures and occasionally use old nests of raptors. This species has a moderate potential to occur and is a likely migrant.

Osprey (*Pandion haliaetus*). The osprey is a CDFW Watch List Species. In California, this species typically breeds in the northern part of the state from the Cascade Range south to Lake Tahoe and along the coast to Marin County (Stephenson and Calcarone, 1999). This species most commonly occurs along rivers, lakes, reservoirs, and seacoasts, often crossing land between bodies of water. Nests are typically found in tree snags, on cliffs, and among various manmade structures, usually near or above water. This species has a high potential to occur and is a likely migrant.

Double-crested Cormorant (*Phalacrocorax auratus*). The double-crested cormorant is a CDFW Watch List Species. Double-crested Cormorants are colonial waterbirds that seek aquatic bodies big enough to support their mostly fish diet. However, they may roost and form breeding colonies on smaller lagoons or ponds, and then fly up to 40 miles to a feeding area. In addition to fishing waters, cormorants need perching areas for the considerable amount of time they spend resting each day. This species has a high potential to occur as a likely migrant.

Purple Martin (*Progne subis*). The purple martin is a CDFW species of special concern. This cavity nester is found in a wide variety of habitats, sometimes found in residential areas and often using human-made structures for nesting. It is mostly found in hardwood and coniferous forests as well as riparian habitats (Airola and Williams 2008). Project within summer range of species. This species has a moderate potential to occur and is a likely migrant.

Rufous Hummingbird (*Selasphorus rufus*). The rufous hummingbird is a USFWS bird of conservation concern. The breeding range for the rufous hummingbird extends through the Pacific Northwest, western Canada, and into southern Alaska. The species migrates through California and the western U.S. and Mexico to wintering grounds in Central America. The rufous hummingbird occurs in open or shrubby areas, forest openings, yards, and parks, and sometimes in forests, thickets, swamps, and meadows from sea level to about 6,000 feet. This species has a high potential to occur and is a likely migrant.

Great Gray Owl (*Strix nebulosa*). The great gray owl is designated as endangered by the state of California (CDFW, 2024b). Great gray owl nesting habitat in California is most commonly associated with dense forest stands adjacent to montane meadow

foraging habitat. Suitable nesting habitat includes mature or old-growth conifer stands with greater than 50 percent canopy cover containing potential nest trees. Nest trees include broken-top snags greater than 16-inches in diameter at breast height, trees containing pre-existing stick nests from other species and mistletoe brooms. The estimated state-wide population size is only 100-200 pairs. Although the project site is located within the historical range of the species, there were no known occurrences of great gray owl within or immediately adjacent to the project site and the nearest known occupied territories were located approximately 85 miles to the northeast in Modoc County (CDFW, 2024b). In addition, during intensive avian studies conducted for the project (FWPA, TN 248308-5), this species was never detected. These efforts included 2 years of avian point count surveys and surveys for northern goshawk and willow flycatcher. However, none of these surveys were conducted at night and no surveys were specifically conducted for this species within the project site.

There is no nesting and limited foraging habitat available for this species within the project site. However, there is a small amount of suitable habitat within a private in-holding located northeast of the project site, but this habitat is isolated and not known to be used by great gray owl (FWPA, TN 248308-5). A review of potentially suitable nesting or foraging habitat in other areas of the project site found no other suitable habitat (FWPA, TN 248308-5). Therefore, there is a very low potential for this species to nest on the project site but it could occur as a migrant.

Northern Goshawk (*Accipiter gentilis*). The northern goshawk is a medium-large raptor with a broad distribution in the western United States, including California and the project site. In California, it is considered an SSC when nesting (CDFW, 2024b). The northern goshawk can occupy a variety of habitats but prefers mature coniferous and deciduous forests. They eat a variety of prey that includes small mammals and birds. Catching most prey while in flight, goshawks prefer to hunt in more open areas such as cleared forest patches, dense forests with open understories, and along waterways. This species is particularly sensitive to forest management practices that reduce or fragment habitat.

It nests in mature and old-growth forests of a range of conifer and conifer-hardwood types. Nest stands consistently have larger trees, greater canopy cover, and relatively more open understory (Hargis et al., 1994; Keane, 1999). Northern goshawk populations exhibit high annual variation in reproduction, with 30 percent to 90 percent of pairs breeding in any year. They have relatively large spatial requirements and occur at relatively low breeding densities (Keane, 2008); a given landscape can support only a certain, limited number of territories. Threats include loss and degradation of habitat, wildfire, timber harvest and fire suppression policies, human population growth, human developments, and recreational activities.

Mainly resident, some individuals from high latitude regions migrate south for the winter. Individuals in North America migrate south along mountain ridge tops at nearly any time of the fall depending on latitude. Over much of their California range, northern

goshawks nest mainly in mature and old-growth forest stands. Suitable stands would occur in a broad range of conifer and conifer-hardwood types such as Ponderosa pine. This hawk prefers the densest stands available for nesting, and those with a high canopy closure and open understories for foraging. There is a limited amount of mature forested habitat within the southeast portion of the project site (FWPA TN 248308-4). Within their territories, goshawks will alternate the use of as many as eight nests sites that can be located up to 1.1 miles (1.8 km) apart.

Project-specific surveys were conducted for goshawks to provide a more current assessment of potential presence of active nests in four historical occurrence areas in CNDDB (FWPA TN 248306-4). Five goshawk detections occurred within the project site between April 2017 and May 2018 during fixed-point large bird use surveys and incidental observations (FWPA, TN 248309-1; FWPA, TN 248309-5). Two goshawk nests also were found in the project site during nest surveys, both inactive, with one in use by a great horned owl (Bubo virginianus) and the other in a state of unusable disrepair (Avian Reports). During the acoustic surveys, goshawks were not detected, either visually or by ear, and no evidence of nesting goshawks was observed (FWPA, TN 248306-4). Although the report authors concluded that the likelihood of nesting goshawks is low in those areas surveyed, this conclusion is not necessarily representative of the entire project site. Suitable goshawk habitat occurs in the southeast portion of the project site, and properties overlapping with the Cedar Boots timber harvest plan have timber and goshawk management plans in place that protect the species and their nests during logging practices (CAL FIRE, 2016). Overall, the species has high potential to occur in the project region.

Bald (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*). The bald eagle is federally protected by the Bald and Golden Eagle Protection Act, is fully protected in California, and is state listed as endangered. Aerial and ground-based eagle and raptor nest surveys were conducted for the project during breeding seasons from 2017-2019, as well as fixed-point eagle use surveys from April 2017 through March 2019 (FWPA, TN 248305-1; FWPA TN 248305-3). Project eagle nest surveys found from nine (2017) to eleven (2019) occupied bald eagle nests within 10 miles of the project site, with the majority along the Pit River and the closest 2.9 miles from the project site boundary. The Pit and Fall rivers support large populations of breeding and wintering bald eagles (FWPA, TN 248305-1; FWPA TN 248305-3). The results of fixed-point eagle use surveys included 22 observations of bald eagles over a two-year survey period, with 13 of the 22 observations made in winter.

The golden eagle is federally protected by the Bald and Golden Eagle Protection Act and is state fully protected in California. Aerial nest surveys found no nesting golden eagles within 10 miles of the project boundary; this includes three historical golden eagle nests, which could not be located during either year of aerial surveys. The applicant suggested that golden eagle nest habitat is not present in the Leasehold Area but that golden eagles may nest in the region. However, eagles can and do nest in forested areas and are difficult to detect from aerial surveys. It is possible that golden eagles are

present in adjacent areas but that nests may have been undetected. During the two-year fixed-point eagle use survey, three golden eagle observations were made. All three observations of golden eagles were made during the spring migration season.

Greater Sandhill Crane (*Grus canadensis tabida*). Greater sandhill cranes were once abundant breeders on the Modoc Plateau of northeastern California but are now less abundant and found in the northern and southern regions of the Central Valley. This subspecies is State Threatened on their nesting and wintering grounds because of declining numbers and a reduction in its Pacific Flyway stopover habitat. *G. c. tabida* of the Central Valley population are migratory between nesting areas in British Columbia, Washington, Oregon, and northeast California to wintering areas of in the Central Valley and south (FWPA TN 248288-6). Sandhill cranes typically use large freshwater marshes, prairie ponds, and marshy tundra during summer and grain fields or prairies during migration and winter. Greater sandhill crane nesting or stopover roosting habitat does not occur within the project site. The closest known nesting habitat is located approximately 20 miles east of the project site, in the Fall River Valley Important Bird Area (FWPA TN 248288-6), but cranes may stop over in other suitable open wetlands in the region.

The project site and broader project area are located at the edge of a known migratory pathway for this species (Donnelly et al 2021.). Sandhill crane movements were derived from 108 individual birds captured and fitted with GPS leg bands. A review of the paper demonstrates that tracked birds fly immediately adjacent to the project site (See **Figure 5-3**). While it is likely the birds represent the broader flock untracked birds likely overfly the site and several hundred sandhill cranes were observed in flight during avian surveys conducted by the Applicant (FWPA TN 248309-1; FWPA TN 248309-5). Sandhill cranes are considered to be present and migrate over the project site in spring and fall.

Willow Flycatcher (*Empidonax traillii*). The willow flycatcher is listed as state endangered under CESA (CDFW, 2024b). It nests primarily within willow thickets along streams in broad valleys, canyon bottoms, mountainside seepages, and at the margins of lakes and pools (Sedgewick, 2000; Gaines, 2005). Willow flycatchers can also be found within bushes, brushy fields, and upland stands of trees near streams or marshes. The current California breeding range of this species is predominantly Northern California within the Sierra Nevada and Cascade mountains region, ranging from southern Shasta County to northern Kern County (Sedgewick, 2000).

Surveys conducted by the applicant did not identify willow flycatcher within or immediately adjacent to the project site (FWPA, TN 248306-1). The nearest known occupied territories were located approximately 20 miles to the northeast of the project site (CDFW, 2024e). The species was not detected during two years of avian point count conducted throughout the project site in 2018 and 2019 (FWPA TN, 248309-1; FWPA TN 248309-5). However, the Applicant noted that avian point count surveys were conducted for the purpose of identifying all birds using the project site.

The applicant also assessed if suitable willow flycatcher habitat was present within the project site (FWPA, TN 248306-3). Willow flycatcher breeding habitat consists of dense deciduous riparian shrub and willow thickets both of which are present within the project site. This species stays close to their preferred habitat of willow thickets and brushy riparian areas, perching and flying between low lying willow thickets. Areas of preferred habitat including willow thickets and brushy riparian areas within the project site were mapped and then buffered by 300 feet to ensure all the habitat was covered and that the average territory size of the willow flycatcher was also included. Three potential willow flycatcher habitat sites were surveyed during the 2018 nesting season (FWPA, TN 248306-1), with listening periods and playback calls conducted to elicit call responses from breeding birds. No willow flycatchers were detected. Based on the age of the surveys and that suitable habitat is present staff considers that the project area has a moderate potential to support this species.

Vaux's Swift (*Chaetura vauxi*). Little is known about life history traits of the Vaux's Swift in California, where the species generally arrives the first week of April through late May. Vaux's Swift may roost individually or in communal groups. Communal roosts are typically large, specialized structures capable of accommodating more than a hundred individual birds and can include mature and old-growth conifers with large top or side cavities as well as man-made structures like chimney (Shuford and Gardali, 2008). In fall, birds arrive to roost sites in northwestern California around late September. This species is a diurnal migrant that flies at heights just at the limit of sight, gathering and circling in large flocks up before dusk in the vicinity of roost sites. The Avian Use Study reported observing a fly-by of a single group comprised of 35 individuals (FWPA, TN 248309-5). No communal nest locations or potential nest sites were identified in the project site (FWPA, TN 248306-2; FWPA, TN 248309-1; FWPA, TN 248309-5).

Olive-sided Flycatcher (*Contopus cooperi*). The olive-sided flycatcher breeds along the edges and openings of forests, including burned areas, and around the edges of wetlands. It uses tall, prominent trees and snags for singing and as foraging perches because of the unobstructed air space they offer. It arrives in northern California from wintering grounds in early May and leaves again in fall. It is more often detected along edge habitats than elsewhere in the forest interior, and it is often present near water, possibly because of higher insect abundance in these areas. The species in western North America has a proclivity for burned areas. Migratory habitat in spring is mainly mountain areas, although winter habitat includes more riparian and non-coniferous habitats. This species feeds on flying insects caught on the wing; hunting in this manner requires open air space for launching from and returning to foraging perches – as opposed to other flycatcher species that forage in mid-air. This species has a high potential to occur.

Yellow Warbler (*Setophaga petechia*). The yellow warbler is a CDFW species of special concern and is a widespread and abundant bird in North America. Occurrence is fragmented and local in the southwest part of the country where it is limited to riparian

corridors. The species is largely absent from the Central Valley region and the southern and eastern desert areas of California. Migrants pass through northwest California in April and again in August to September. Found typically in riparian habitats, it is primarily an insectivore. During migration, collision fatalities occasionally occur at television towers and other tall, lighted structures. Preferred breeding areas are wet, deciduous thickets dominated by willows and in disturbed and early successional habitats. This species has a high potential to occur.

Yellow-breasted chat (*Icteria virens*). Yellow-breasted chat is a CDFW SSC (CDFW, 2024b). It nests in early-successional riparian habitats with a well-developed shrub layer, most commonly within the narrow riparian border around streams, creeks, sloughs, and rivers, often in the dense thickets and tangles (Shuford and Gardali, 2008b). This species was observed during surveys by the Applicant and is considered to have a high potential to occur.

Burrowing owl (*Athene cunicularia*). In California, western burrowing owls are yearlong residents of flat, open, dry grassland and desert habitats at lower elevations (Bates, 2006). They typically inhabit annual and perennial grasslands and scrublands characterized by low-growing vegetation and also may occur in areas that include trees and shrubs if the cover is less than 30% (Bates, 2006); however, they prefer treeless grasslands. Although western burrowing owls prefer large, contiguous areas of treeless grasslands, they have also been observed in fallow agriculture fields, golf courses, cemeteries, road allowances, airports, vacant lots in residential areas and university campuses, and fairgrounds when nest burrows are present (Bates 2006). The availability of numerous small mammal burrows, such as those of California ground squirrel (*Spermophilus beecheyi*), is a major factor in determining whether an area with apparently suitable habitat supports western burrowing owls (Coulombe, 1971). Western burrowing owls are opportunistic, primarily feeding on arthropods, small mammals, and birds, and often need short grass, mowed pastures, or overgrazed pastures for foraging. Western burrowing owls are primarily crepuscular in their foraging habits, but hunting has been observed throughout the day (Thomsen 1971). Insects are often taken during daylight, whereas small mammals are taken more often after dark.

Most western burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October and north during March and April, and into the first week of May. These individuals' winter within the breeding habitat of more southern-located populations. Thus, winter observations may include both the migrant individuals as well as the resident population. Small populations are known from the Sierra Valley areas of Lassen and Plumas County. They likely occur as a migrant.

Short-eared owl (*Asio flammeus*). This species is a widespread winter migrant in California, primarily occurring in the Central Valley, the western Sierra Nevada foothills, and along the coastline. Known breeding areas in northern California are located

throughout Modoc, Siskiyou, and Lassen Counties. Occasionally they can be found breeding in Fall River Valley, Shasta County. The short-eared owl is usually found in open areas with few trees, including annual grasslands, prairies, dunes, meadows, agricultural fields, and emergent wetlands. Tall grasses, brush, ditches, and wetlands are used for resting and roosting cover (Shuford and Gardali, 2008c). Short-eared owls typically breed from early March through July (Bent, 1937). Courtship activities consist of aerial displays and hooting (Pitelka et al., 1955). Clutches usually consist of 5-7 eggs, however, may be higher during periods of high prey abundance. Females incubate the eggs and care for the semialtrical young while males bring food to females at the nest. This species is primarily a crepuscular hunter, and the great majority of their diet consists of small mammals. This species likely occurs as a migrant and could occur in some of the larger meadows in the region.

Mammals

Porcupine (*Erethizon dorsatum*). This nocturnal species is found throughout the Sierra Nevada and Cascades from Kern County north to the Oregon border. Porcupines are usually found in montane conifer, Douglas-fir, alpine dwarf-shrub, and wet meadow habitats. However, they can also be found in hardwood, hardwood-conifer, montane and valley-foothill riparian, aspen, pinyon-juniper, low sage, sagebrush, and bitterbrush (Woods, 1973). Dens can be found in caves, crevices in rocks, cliffs, hollow logs, snags, burrows of other animals. Mating usually occurs in fall or winter followed by giving birth during April through June. Their diet fluctuates depending on the season but includes herbs, shrubs, fruit, leaves, twigs, bark and cambium of trees. This species has a moderate potential to occur.

Sierra Martin (*Martes caurina sierra*). This species is found in the Sierra Nevada and Cascade Mountains as well as the Klamath/Trinity Mountains. Habitat consists of late-successional conifer forests, with a preference for true fir and lodgepole pines, containing large amounts of downed trees and snags. Elevation can reach up to 3200 meters. Riparian areas are important for foraging areas. Diet varies with the season but can consist of various mammals, birds, insects and fruit (Martin 1994). This species has a moderate potential to occur in the adjacent LNF and may periodically forage in denser vegetation in or near the project area.

Gray Wolf (*Canus lupis irremotus*). The gray wolf is federally endangered and California threatened (CDFW, 2024b). Once extirpated from California, gray wolves have been detected in Northern California in recent years, beginning in 2011 (FWPA, TN 248288-6). CDFW has noted that gray wolves have passed through or adjacent to the Project Site in recent years, and a suspected wolf track was documented at the project site in the winter of 2018 (FWPA, TN 248288-6). An adult female gray wolf was found dead in Shasta County in February 2020 (KRCRTV, 2020).

There are currently nine confirmed wolf packs in northern California, ranging from Siskiyou County in the north as far south as Tulare County. Although no current packs are known to occur within Shasta County, recent records have been documented in

Lassen County immediately to the east. This pack, known as the Lassen Pack, is California's second known pack, occupies a large area of western Lassen and northern Plumas Counties with a home range of approximately 332 square miles. There may be the potential for future dispersal into the project area if current packs expand their ranges or if new packs are established.

The gray wolf is a habitat generalist, historically occupying tundra, taiga, forests, grasslands, and deserts throughout North America (Kovacs et al., 2016). Its primary habitat requirements are adequate ungulate prey (deer, elk, antelope) and water. Habitat use is strongly affected by the availability and abundance of prey, availability of den sites, ease of travel, snow conditions, availability of protected public lands, density of livestock, road density, human presence, and topography (Paquet and Carbyn, 2003).

The species requires large, diverse, and undisturbed territories. It is possible that overtime wolves could occur at or near the project site. There are historic records of this species near Burney California and suitable habitat is present. There is a moderate potential for this species to be present.

California Wolverine (*Gulo gulo*). The California Wolverine is state listed as threatened in California. Its preferred habitat includes higher elevation mixed conifer forests with seasonal snowfall in the Northern Sierra Nevada (Johnson, 2024). The species primarily subsists on a diet of small mammals and carrion, often hunting in open areas adjacent to mixed conifer forests, where dense forest cover provides denning habitat. California wolverines tend to avoid human disturbance and can range large distances within suitable habitats (FWPA, TN 248288-6). The project site supports suitable mixed conifer forest habitat that could be used by this species. However, the area is subject to routine logging which may limit the potential use of this site by this species. Several occurrences of this species have been noted to the east and on the northeast boundary of the project site, though the records are 50 years old (CNDDB, 202e). This species is unlikely to occur within the project site.

American Badger (*Taxidea taxus*). The American Badger is a California SSC and an uncommon permanent resident of California, most found in grassland, shrubland, agricultural, and woodland edge habitats with friable soil for burrowing. Badgers are carnivorous and prey on a variety of species, including ground squirrels, reptiles, birds, and carrion depending on seasonal availability. The CNDDB documents badgers 6.5 miles east of the project (CDFW, 2024e), but suitable open habitat for badgers is limited on the project site. This species has a low potential to occur.

Fisher (*Pekania [=Martes] pennant*). The West Coast distinct population segment (DPS) of fisher is proposed Threatened by the USFWS and currently under review (USFWS, 2019b). The Northern California evolutionarily significant unit (ESU) – consisting of fishers that occur within California in the Klamath Mountains, Coast Range, southern Cascades, and northern Sierra Nevada is a California SSC. Fishers are

opportunistic, generalist predators, that prefers mature, dense forest stands. Suitable habitat also contains snags, hollow logs, brush piles, and similar types of denning cover. The CNDDB documents several occurrences of fishers within the project site, and in the surrounding area (CDFW, 2024e). This species has high potential to occur on the project site.

Oregon Snowshoe Hare (*Lepus americanus klamathensis*). The Oregon Snowshoe Hare is a subspecies of snowshoe hare that occurs in the vicinity of Mt. Shasta, the Trinity Mountains, and the Warner Mountains. It is a California SSC. The snowshoe hare prefers heterogeneous habitats with dense understory, as well as riparian habitats, and is rarely found in open habitat or mature closed canopy forests. The project landscape is patchwork of heterogeneous habitats, due to both logging and fire, and supports suitable habitat for this species. This species has a moderate potential to occur on the project site.

Sierra Nevada Red Fox (*Vulpes vulpes necator*). The Sierra Nevada red fox consists of two Distinct Population Segments (DPSs) in northern California. The Sierra Nevada DPS was listed as federally endangered in 2021 and is also State-listed as threatened. Because loss of habitat or contraction of the current range are not considered a threat to this DPS, critical habitat has not been designated. Only about 18-39 individuals belonging to this DPS remain in the wild and sightings have been limited to federal lands in Alpine, Fresno, Inyo, Madera, Mono, and Tuolumne Counties well over 150 miles south of the project area. Therefore, individuals from the Sierra Nevada DPS are not expected to occur.

The Southern Cascades DPS includes several populations occurring at various locations along the lower Cascades from Lassen National Park in California, to near the Columbia River on Oregon's northern border. Although this DPS does not currently have federal listing, it is State-listed as threatened.

The Sierra Nevada red fox is one of three montane red fox subspecies found in the western United States that are uniquely adapted to live in cold, snowy environments. These adaptations include smaller body size relative to most other fox species, a thick coat, and hair covering their foot pads in the winter.

This species is typically found in a variety of habitats, seasonally ranging from lower elevation montane to subalpine and alpine vegetation communities. In the summer, the species is more positively associated with higher elevations more so than use of specific vegetation communities (Perrine, 2005). In winter, habitat selection appears to be linked more to the extent of forest comprised of large trees of greater than 60 cm DBH and greater than 40 percent canopy closure (Perrine, 2005; Benson et al., 2005). This preference for mature closed-canopy forests in the winter may be due to lessened snow depth and consequent ease of travel, availability of sheltered day-rest areas formed by downed woody debris, increased access in day-rest areas to prey living below the snow and increased visual cover and better protection from predatory coyotes (Perrine, 2005;

Benson et al., 2005). Sierra Nevada red fox hunts primarily for small and medium-sized mammals in meadows, fell-fields, grasslands, wetlands, and other open habitats. Habitat edges are used extensively while moving between forested habitats for cover and reproduction and open hunting grounds (Tesky, 1995).

Although there are no known records within 10 miles of the project area, Sierra Nevada red fox has been historically documented around Mount Shasta to the north and within Hat Creek Valley just to the east; however, these populations have likely been extirpated from these areas. Recent observations are scattered around Lassen Volcanic National Park approximately 25 miles to the southeast. Staff considers this species to have a low likelihood of occurring in the project area.

Ringtail (*Bassariscus astutus*). Formerly referred to as the ring-tailed cat, the ringtail is a California FP species under the CESA (CDFW, 2024b). The ringtail is a nocturnal relative of the raccoon and is found at from sea level up to 9,500 feet but most common below 4,600 feet, its range includes all or most of northwestern California. m) where rocky outcrops, canyons, or talus slopes occur in a variety of habitats including riparian; desert; chaparral; woodlands of oak, pinyon pine, juniper; and montane conifer forests. Barrett (1997) reported high densities in riparian forests along the Sacramento River and its tributaries. Because it is not tracked by CDFW in the CNDDB, there would be no CNDDB records. It was not detected during the surveys. There are, several iNaturalist ringtail records for Shasta County, the closest dated from 2022 at Lake Britton (iNaturalist, 2024). This species is expected to have a moderate to high potential to occur.

Bats. Seventeen bat species have the potential to occur within the project site; none are federally, or state listed, and five are considered California SSC. Fourteen of the seventeen species have been acoustically detected within the project area. Of these species, the spotted bat (*Euderma maculatum*) and the western mastiff bat (*Eumops perotis*), are California SSC. Other species with the potential to occur are described below.

Pallid bat (*Antrozous pallidus*). The pallid bat hunts on and near the ground. This opportunistic foraging bat is a generalist, preying on myriad insects like arthropods, whether prey is flying or stationary. They may echolocate while flying, but generally use passive acoustic cues to locate prey. This species has a high to moderate potential to occur.

Pacific Townsend's Big-eared Bat (*Corynorhinus townsendii*). The Pacific Townsend's big-eared bat occupies numerous habitats up to 3,000 feet in elevation. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines. Roost site use varies within seasons and among years. Both maternity and winter hibernating colonies vary in size from a few individuals to colonies of several hundred, with wintering groups composed of both sexes. This species forages in edge habitats preferably along streams and around and in a variety

of wooded habitats and can cover large distances while foraging. This species has a moderate potential to occur.

Spotted Bat (*Euderma maculatum*). The spotted bat is a solitary species that infrequently will roost or hibernate in small groups. It is found to nearly 9,000 feet in elevation and prefers to inhabit areas of rock cliff and canyons, roosting in highly fractured rock crevices. During summer, bats may travel from low- to high-elevation feeding areas and return prior to dawn. E. maculatum is capable of long distance and rapid flight, and foraging ranges can be large. Individuals forage alone about 6.6-164 feet above ground. This species has a high to moderate potential to occur.

Western Red Bat (*Lasiurus blossevillii*). The western red bat is broadly distributed through much of the western United States. Generally solitary, this species is highly migratory, moving in groups and loosely grouping together to forage in summer. It roosts predominantly in the foliage of trees or shrubs. Little is known about their winter behavior. Roost characteristics are specific: hidden from view, opening beneath to allow bats to drop into flight, dark, sheltered from elements, and generally on south or southwest side of a tree. Prey includes large, nocturnal, winged insects like moths, leafhoppers, and flies. This species forages on the wing and around artificial nighttime lights. This species has a moderate potential to occur and likely occurs as migrant.

Western Mastiff Bat (*Eumops perotis*). The western mastiff bat is a CDFW species of special concern and is a colonial bat species that occurs from western Texas to parts of southern California, and most recently in northern California to within a few miles of the Oregon border. In California, it was previously thought that this species occurs only to 1,230 feet (375 m) elevation, however, this species roosts up to 4,593 feet (1,400 m) and can forage up to 8,858 feet (2,700 m). This bat species has limited maneuverability in flight. The distribution of this species is likely only where there are significant rock features offering suitable roosting habitat. It may be found in broad, open habitats, including desert scrub, chaparral, oak woodland, grasslands, and high elevation meadows of mixed conifer forests. This bat requires open, unobstructed waterways for drinking, and drought conditions can impact the species. This species was detected and is assumed present and as a likely migrant.

Hoary Bat (*Lasiurus cinereus*). A migratory species, the hoary bat is a CDFW species of special concern and is the most widespread of all North American bats. This common, solitary species winters along the California coast and in southern California, breeding inland and north of the winter range. Habitats suitable for roosting include woodlands and forests with medium-to-large trees and dense foliage. Hoary bats prefer open habitats or habitat mosaics with access to trees for cover, and open areas or habitat edges for feeding. They have a strong foraging preference for moths, although various flying insects are also taken (Harris, 2024). This species is documented on the project site and at the nearby Hatchet Ridge Wind Project (FWPA, TN 248288-6).

Regulatory

Federal

Endangered Species Act (16 U.S.C. § 1531 et seq., and 50 C.F.R., part 17.1 et seq.). The Endangered Species Act (ESA) designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Its purpose is to protect and recover imperiled species and the ecosystems for which they depend. It is administered by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The USFWS is responsible for terrestrial and freshwater organisms while NMFS is responsible for marine wildlife such as whales and anadromous fish (such as salmon). Species may be listed as endangered or threatened. All species of plants and animals, except pest insects, are eligible for listing. Species are defined to include subspecies, varieties, and for vertebrates, distinct population segments. The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under federal permit. "Take" is broadly defined in ESA to include "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct" (16 U.S.C., §1532(19)). Take can also include significant habitat modification or degradation that directly results in death or injury to a listed wildlife species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 C.F.R., §17.3). Take of federally listed species as defined in the ESA is prohibited without incidental take authorization, which may be obtained through Section 7 consultation (between federal agencies) or a Section 10 Habitat Conservation Plan.

The Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668c). This Act—enforced through regulations written by the USFWS—prohibits the "taking" of bald and golden eagles, including their parts, nests, or eggs. To take is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb" any bald or golden eagle, whether "alive or dead...unless authorized by permit". The administering agency is USFWS.

Migratory Bird Treaty Act (16 U.S.C §§ 703-711). The Migratory Bird Treaty Act (MBTA) makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid federal permit. The USFWS has authority and responsibility for enforcing the MBTA. The administering agency is USFWS.

Clean Water Act Sections 401 and 404 (33 U.S.C., §§ 1251—1376). The Clean Water Act (CWA) requires the permitting and monitoring of all discharges to surface water bodies. Section 404 (33 U.S.C. § 1344) requires a permit from the USACE for a discharge from dredged or fill materials into a water of the United States, including wetlands. Section 401 (33 U.S.C. § 1341) requires a permit from the regional water quality control board for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California

water body, including wetlands, must request state certification that the proposed activity will not violate state and federal water quality standards. The administering agency is the USACE (Section 404) and the State or Regional Water Quality Control Board (Section 401).

Rivers and Harbors Act Section 10 (33 U.S.C. § 401 et seq.). Section 10 of the Rivers and Harbors Act of 1899 requires authorization from USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States requires a Section 10 permit if the structure or the work affects the course, locations, or condition of the water body. This applies to any dredging or disposal of dredging materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States and applies to all structures.

State

California Endangered Species Act (Fish and Game Code [CFGC] §§ 2050-2098). The California Endangered Species Act (CESA) of 1984 states that all native species of fish, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected and preserved. CESA prohibits the take of any species of wildlife designated by the California Fish and Game Commission as endangered, threatened, or candidate species. The CDFW may authorize the take of any such species if certain conditions are met. These criteria are listed in Title 14 of the California Code of Regulations, Section 783.4 subdivisions (a) and (b). For purposes of CESA "take" means to hunt, pursue, catch, capture, or kill (CFGC § 86). The administering agency is CDFW. For the purposes of the proposed project the CEC has in-lieu permitting authority to issue the incidental take permit should impacts to State listed species occur.

Fully Protected Species (CFGC §§ 2081.15, 3511, 4700, 5050, and 5515). These sections designate certain species as fully protected and prohibit the take of such species or their habitat unless for scientific purposes (see also Cal. Code Regs., tit. 14, §670.7). The incidental take of fully protected species may also be authorized in an approved natural community conservation plan (CFGC § 2835) or more recently by state legislation related to some renewable energy projects. The administering agency is CDFW. For the purposes of the proposed project the CEC has in-lieu permitting authority to issue the incidental take permit should impacts to State listed species occur.

California Fish and Game Code. The following sections of the CFGC designate protections for birds and/or their nests or eggs. The administering agency is CDFW.

- **Section 3503:** This section makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.

- **Section 3503.5:** This section makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes and Strigiformes or to take, possess, or destroy the nest or eggs of any such bird.
- **Section 3513:** This section protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame birds.
- **Section 3800:** All birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds are nongame birds. It is unlawful to take any nongame bird except as provided in this code or in accordance with regulations of the commission or, when relating to mining operations, a mitigation plan approved by the department.

California Lake and Streambed Alteration Notification/Agreement (CFGC § 1602). These sections stipulate that an entity shall not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. For the purposes of the proposed project the CEC has in-lieu permitting authority to issue the Lake and Streambed Alteration for the proposed project.

Furbearing and Mammal Protection. Additional regulations are in place protecting furbearing mammals as follows:

- Fish and Game Code §251.1 prohibits the harassment of any furbearing mammal. Harass is defined as an intentional act that disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding, or sheltering.
- California Code of Regulations Title 14 §460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time.

Native Plant Protection (CFGC § 1900 et seq.). The Native Plant Protection Act was enacted in 1977 and designates state rare and endangered plants and provides specific protection measures for identified populations. Those laws prohibit the take of endangered or rare native plants but include some exceptions for agricultural and nursery operations; for emergencies; after properly notifying CDFW, for vegetation removal from canals, roads, and other sites; due to changes in land use; and in certain other situations. The administering agency is CDFW.

Porter-Cologne Water Quality Control Act (California Water Code Division 7). The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over all surface water and groundwater in California, including wetlands, headwaters, and riparian areas. The SWRCB or applicable RWQCB must issue waste discharge requirements for any activity that discharges waste that could affect the quality of waters of the state.

Oak Woodlands Preservation Act (California P.R.C. §21083.4). This Public Resources Code section states that if a County determines that a project in its jurisdiction may result in a conversion of oak woodland that would be considered significant under CEQA, then mitigation for this impact is required. The mitigation can include 1) conservation of oaks on the site; 2) replanting oaks (can be used for a maximum of 50 percent of the required mitigation); 3) contribution to the Oak Woodlands Conservation Fund; and/or 4) other mitigations developed by the County.

Local

Shasta County General Plan. The Fish and Wildlife Habitat Element (6.7) of the Shasta County General Plan contains policies (summarized below) to guide County planning for biological resource conservation and management (COS, 2004):

- **Policy FW-b:** Recognition that classification of some fish, wildlife, and vegetation resources designated and used as Timberlands in most cases protects habitat resources. However, if there is a conflict, the timber land use classifications shall prevail in a manner consistent with State and Federal laws.
- **Policy FW-c:** Projects that contain or may impact endangered and/or threatened plant or animal species, as officially designated by the California Fish and Game Commission and/or the USFWS, shall be designed or conditioned to avoid any net adverse project impacts on those species.
- **Policy FW-d:** The significant river and creekside corridors of Shasta County shall be designated on the General Plan maps. The primary purpose of this designation is to protect the riparian habitats from development and from adverse impacts from conflicting resources uses. Riparian habitat protection along the significant river and creekside corridors, as designated on the plan maps shall be achieved, where appropriate, by the following measures:
  - regulation of vegetation removal.
  - design of grading and road construction to restrict sediment input to all streams.
  - establishment of a development set-back.
  - the siting of structures, including clustering.
- **Policy FW-f:** The County should encourage and support efforts by State and Federal agencies that implement the Upper Sacramento River Fisheries and Riparian Habitat Management Plan.

Oak Woodland Voluntary Management Guidelines. The County adopted these voluntary guidelines in 1995 to encourage retention of an average canopy of 30 percent or more when harvesting oaks, including trees of a variety of species, ages, and conditions, as well as brush piles, hollow trees, and other habitat components. The guidelines recommend the clustering of buildings, protection of residuals, and replacement of removed trees when building occurs among oaks. Development, including roads, cuts and fills, foundations and septic systems should be carefully

planned to avoid impacts. The guidelines also recommend landowners consider replacing trees unavoidably removed during construction and contact a specialist for help maintaining large or specimen trees. Because oak woodland habitat is present within the project site, these guidelines are considered in the analysis.

5.2.2 Environmental Impacts

BIOLOGICAL RESOURCES Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b. 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 Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d. 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 wildlife nursery sites?	☒	☐	☐	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, biological resources.

5.2.2.1 Methodology and Thresholds of Significance

Staff used the following methodology and thresholds of significance to evaluate impacts from the proposed project. Impacts to biological resources were assessed through consideration of effects on the landscape, habitat, community, and species level for the proposed project and alternatives. Impacts refer to any project related activity including

initial ground disturbance, vegetation removal, timber harvest, construction, management of shaded fire breaks, road improvements, operation of the wind turbines, and any other long-term O&M activities that would be implemented to support the operation of the proposed project.

Appendix G of the CEQA Guidelines provides a set of topical guidance questions for an agency to consider when determining whether the project has any significant impacts. For biological resources the questions are, 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 CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404, of the Clean Water Act (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- 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; or
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

An impact to biological resources would be considered significant (before considering offsetting mitigation measures) if the construction or operation of the project would result in one or more of the following:

- The potential for reduction, loss, or degradation of habitat for threatened, endangered, or special status species;
- The potential for loss or “take” of any federal or state listed plant or animal species; fully protected species; special status species, or species protected by the MBTA or other regulations;
- A net loss or permanent change in the extent or functional value of any habitat or biotic community considered biologically, scientifically, recreationally, or economically significant by federal, state, or local policies, statutes, and regulations;
- Adverse effect on federally protected wetlands as defined in Section 404 of the Clean Water Act;

- Alteration or destruction of habitat that precludes reestablishment of native populations of plants and animals;
- Impairment of movement, migration, or dispersal of resident and migratory fish and wildlife species; or
- Substantial loss of habitat or population decline of any native fish, wildlife or plant species, or overall reduction in biological diversity.

Each impact under consideration for biological resources is separately listed in bold text and contains a CEQA statement of the significance determination for the environmental impact as follows:

- **Significant and Unavoidable:** An impact that cannot be reduced to below the threshold given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the project is approved per §15093 of the State CEQA Guidelines.
- **Less than Significant with Mitigation:** An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires finding to be made under §15091 of the State CEQA Guidelines.
- **Less than Significant:** An impact that may be adverse but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.
- **Beneficial:** An effect that would reduce existing environmental problems or hazards.

Methodology

Definition of Impact Areas. For the purposes of analysis, the **project site** is defined as all areas subject to permanent and temporary impacts. This includes a buffer of approximately 130 feet from existing and new access roads and other project components, and a circular buffer of approximately 700 feet around the WTGs. The **project area** includes the project site and the area surrounding the proposed wind farm. It includes all access roads and the habitat that occurs between rows of turbines. The **project region** includes all areas within 10 miles of the project site and beyond.

Direct and Indirect Impacts. Direct impacts are defined under CEQA as those effects that result from a project and occur at the same time and place. Some examples of direct impacts could include the removal of vegetation or habitat; disruption to natural behavior from increased human presence and/or noise; mortality or injury from crushing, trampling, or entrapment; and exposure to fugitive dust, herbicides, or other hazardous materials.

Indirect impacts are caused by a project but can occur later in time or are farther removed in distance but are still reasonably foreseeable and related to the project. Indirect impacts can include the disruption of native seed banks, spread of invasive plant species, changes to soil or hydrology that adversely affects native species over time, disruption of prey base, or increased predation through alterations of the physical landscape from project features. Indirect impacts may also include fragmentation of habitat, edge effects, increased traffic, and human disturbance. Long term indirect effects may also occur from the operation and maintenance of the Proposed Project.

Permanent and Temporary Impacts. Permanent or long-term project related impacts include the conversion of land to a new use, such as the construction of new roads, substation, WTG pads, or the conversion of timber lands to shaded fuel brakes or the removal of vegetation around the WTGs. Temporary or short-term impacts result from activities that are of short duration (i.e., six to 12 months) and that do not result in a permanent land use conversion. Temporary impacts of the project include ground disturbance, noise, human activity, and vehicle traffic associated with the construction phase. It should be noted that some temporary impact areas may be considered permanent impacts if the revegetation criteria described in the proposed conditions of certification are not met.

Overview of Construction Impacts

Table 5.2-5 provides a broad summary of the types of impacts to biological resources that would or could occur during the construction and operation of the proposed project. Specific impacts to individual species are discussed below. Direct impacts include the potential for wildlife injury and mortality, the temporary and permanent loss of individual plants, and the loss of habitat used by plant and wildlife species. Construction of the project would require the removal of large areas of vegetation and grading to widen or create new roads to provide vehicle and equipment access and for siting the WTGs.

Blasting may also be needed to excavate tower footings or create new roads. Grading would be required to provide level work areas to support tower footing excavation (i.e., drilling) and construction of the WTGs. In addition, ground disturbance would be required to construct the underground power collection cables, transmission line poles, and facilities including the substation and maintenance facilities. Helicopters may be used during the construction of the transmission infrastructure. The development of the shaded fuel breaks would also result in the transition of conifer woodlands and other vegetation communities to low growing scrub communities along many access roads and around each of the WTGs.

Each of these activities has the potential to result in direct and indirect impacts to plants and wildlife. Likewise, areas that were disturbed during construction but would not be permanently used for project components would be revegetated. Some temporarily impacted areas would be returned to near pre-project conditions however other locations would be managed to prevent the establishment of tall trees or dense

vegetation to reduce the risk of wildfires damaging the WTGs. Other areas where temporary impacts would result from excavation, such as around WTG footings and along road cuts in shrubby vegetation or rocky terrain, would require more time to recover. Impacts to riparian vegetation would occur at stream crossings or where access roads would be widened to accommodate the length of the turbine blades. Some of these areas would be permanently lost and mitigation would be required. Indirect impacts to biological resources during construction could result from increased human activity, the introduction of non-native or invasive plants or wildlife, night lighting, dust, noise, soil compaction, wind and water erosion, and exposure to herbicides from vegetation management activities.

TABLE 5.2-5 GENERAL SUMMARY OF POTENTIAL IMPACTS TO BIOLOGICAL RESOURCES

Resource Type	Potential Impacts
Plants and Native Vegetation	■ Removal of native vegetation communities and individual special-status plants ■ Induced successional transition to early seral vegetation communities in shaded fuel breaks ■ Disruption of native seed banks and soil compaction ■ Wind and water erosion ■ Degradation of habitat from elevated levels of erosion and sedimentation ■ Exposure of individual special-status plants or native vegetation communities to fugitive dust and herbicides ■ Degradation of habitat or displacement from invasive and noxious weeds ■ Risk of construction or operational related wildfires
Invertebrates	■ Loss or modifications to habitat and microhabitats ■ Mortality or injury from crushing, trampling, or blasting ■ Loss of leaf litter or host plants ■ Degradation of habitat from increased erosion and sedimentation ■ Exposure to fugitive dust, herbicides, and other hazardous materials ■ Degradation of habitat from invasive and noxious weeds ■ Vibration or noise from turbines ■ Collisions with turbine blades for aerial species ■ Risk of construction or operational related wildfires
Fishes	■ Degradation of riparian habitat and water quality from the introduction of sediment ■ Impediments to movement through the watershed ■ Exposure to herbicides and other hazardous materials ■ Long-term alterations to hydrology ■ Degradation of aquatic habitat from invasive weeds ■ Introduction of non-native aquatic species on vehicles or equipment ■ Risk of construction or operational related wildfires
Amphibians	■ Degradation of riparian habitat and water quality from the introduction of sediment ■ Mortality or injury from crushing, trampling, or entrapment ■ Disruption of breeding behavior ■ Exposure to herbicides and other hazardous materials ■ Exposure to chytrid fungus ■ Habitat fragmentation and creation of dispersal barriers ■ Long-term alterations to hydrology ■ Degradation of habitat from invasive weeds ■ Introduction of non-native aquatic species on vehicles or equipment ■ Risk of construction or operational related wildfires ■ Shadow flicker from turbine blades

TABLE 5.2-5 GENERAL SUMMARY OF POTENTIAL IMPACTS TO BIOLOGICAL RESOURCES	
Reptiles	■ Degradation of riparian habitat and water quality from the introduction of sediment ■ Loss of nesting, breeding, basking, or hibernacula sites ■ Mortality or injury from crushing, trampling, or entrapment ■ Exposure to herbicides and other hazardous materials ■ Introduction of non-native predators or competitors ■ Habitat fragmentation and edge effects ■ Long-term alterations to hydrology ■ Degradation of habitat from invasive weeds ■ Risk of construction or operational related wildfires ■ Shadow flicker from turbine blades
Birds	■ Loss of breeding, foraging, and/or dispersal habitat ■ Disturbance to breeding behavior from blasting, construction noise or helicopter use ■ Destruction of nests or eggs ■ Exposure to herbicides and other hazardous materials ■ Habitat fragmentation and edge effects ■ Increased interactions with invasive or predatory species ■ Degradation of habitat from invasive weeds ■ Collisions with wind turbines, met towers, and guy wires ■ Increased potential of electrocution or powerline collisions ■ Entrapment in tower bodies, or other nacelles and wind turbine equipment ■ Risk of construction or operational related wildfires ■ Shadow flicker from turbine blades
Mammals	■ Injury or mortality from crushing or entrapment ■ Loss of suitable habitat or disruption of habitat use ■ Disturbance or destruction to nests or natal sites ■ Exposure to herbicides or other hazardous materials ■ Degradation of habitat from invasive and noxious weeds ■ Disruption of movement corridors ■ Changes in predation risk ■ Collisions with wind turbines, met towers, and guy wires ■ Exposure to barometric trauma (bats) if they fly through rotor swept area ■ Increased potential for powerline collisions ■ Risk of construction or operational related wildfires ■ Shadow flicker from turbine blades
Wildlife Corridors and Nursery Sites	■ Interference with established wildlife migratory corridors ■ Risk of construction or operational related wildfires ■ Loss or disturbance to nursery sites
Water Resources and Riparian Habitats	■ Removal of riparian vegetation ■ Degradation of water quality from elevated erosion and sedimentation ■ Release of herbicides or other hazardous materials ■ Reduced riparian function from invasive and noxious weeds ■ Risk of construction or operational related wildfires

Overview of Operation and Maintenance Impacts

Direct impacts to plants and wildlife would occur during the operation and maintenance of the project. Windfarms are a known source of bat and avian mortality, and the magnitude of these effects vary by turbine design, height, the rotor swept area, and the location of the project. The proposed project has a rotor swept area of over 500-feet in diameter based on a blade length of over 250 feet. In addition to the large rotor swept

area the layout of the project includes multiple rows of turbines which could increase the risk to birds and bats from collisions compared to the adjacent hatchet Ridge Wind Farm which consists of a single row of turbines. The loss of bat and avian species will also occur because of collisions with power line poles, electrical distribution lines, meteorological towers, the WTGs, and WTG blades. Impacts to more terrestrial species would likely occur during vegetation management activities which would require vegetation thinning and herbicide use or from vehicle collisions along the many access roads associated with the project. Direct impacts to vegetation include the loss of individual plants during road maintenance, vegetation management, and various facility repairs. Except for impacts to bats and birds, indirect impacts during the O&M phase would be similar to those occurring during construction but would be less severe because less disturbance and vehicular traffic would occur, and fewer people would be present.

Mitigation Strategy. Each of the proposed mitigation measures have been developed to ensure that impacts to sensitive biological resources are minimized or avoided to the extent possible based on the construction and operation of the project. Because of the CECs regulatory obligation under Section 1600 et seq of the CDFG Code and to comply with CESA requirements to fully mitigate impacts to State listed species the mitigation measures were developed in close cooperation with the CDFW. Where appropriate, the Applicant's recommended mitigation (see the various Biological Resources Technical Reports) was incorporated into the mitigation measures proposed below.

5.2.2.2 Direct and Indirect Impacts

a. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Native Vegetation and Sensitive Habitats

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Construction would result in permanent and temporary impacts to native and sensitive vegetations communities. Most impacts would occur to managed timberlands that include early seral stands of conifer woodland, recently logged areas, and woodlands proposed for harvest. Some impacts would occur to riparian vegetation, wet montane meadows, and chaparral communities. Most of these communities are relatively common in the region and could be mitigated with Staffs proposed COC's. For further discussion on project related impacts to Timber Lands see **Section 5.17, Forestry Resources**.

Background and Analysis. Implementation of the proposed project would result in permanent and temporary impacts to native and non-native vegetation communities

and other land cover types. In addition, native vegetation would be permanently converted into shaded fuel breaks along portions of the primary access road, around each of the WTGs, and along the spur roads leading to the turbines. It is important to note that in most areas the shaded fuel break would occur within temporarily disturbed areas which would result in a permanent type conversion of vegetation. While not a permanent loss of vegetation, the area would be subject to ongoing management which alters the types of species and vegetation that occur in those areas. Therefore, any type conversion of sensitive habitats such as riparian or wet meadows would be considered a permanent loss of function. For more common vegetation communities including the existing timber lands the type conversion would result in the preservation of low growing vegetation that would still be used for foraging and habitat by different guilds of wildlife if managed correctly.

Table 5.2-6 provides a summary of the temporary and permanent impacts to native vegetation and other land cover types. Several of these communities are considered sensitive or support sensitive plants and wildlife. This includes approximately 508.54 acres of permanent impacts, 549.69 acres of temporary impact. In addition, approximately 643.79 acres will be transitioned into shaded fuel breaks. Construction activities would result to direct and indirect impacts to conifer woodlands, chaparral communities, non-native grasslands, riparian habitats, of wet meadows, and other cover types (see **Table 5.2-6**). Construction of the project would also result in direct and indirect impacts Rocky Mountain Maple Provisional Shrubland Alliance. This community is considered rare by the CDFW and has a State Rank of S3, and is found in riparian areas along ephemeral, intermittent and perennial stream drainages (see **Figure 5.2-1a through 5.2-1g**).

TABLE 5.2-6 IMPACTS TO NATIVE VEGETATION AND LANDFORMS

Vegetation or Landform	Permanent	Temporary	Acres Converted to Shaded Fuel Breaks
Mixed Conifer Forest / Ponderosa Pine Forest Recently Logged	69.15	75.02	92.57
Mixed Montane Riparian Forest	1.93	2.42	3.07
Mixed Conifer Forest / Ponderosa Pine Forest Burned	288.50	311.07	358.80
Mixed Conifer Forest / Ponderosa Pine Forest Unburned	140.82	146.18	182.34
Mixed Montane Chaparral / Green Leaf Manzanita Chaparral	3.89	4.12	3.71
Mixed Montane Riparian Scrub	2.62	4.20	0.0
Montane Meadow / Bentgrass – Tall Fescue Herbaceous Semi-Natural Alliance	0.03	0.25	0.56
Wet Montane Meadow / Beaked Sedge Meadows Herbaceous Alliance	0.40	0.92	1.60
Rock Outcrops	0.03	0.11	0.004
Existing Transmission Line ROW	1.17	1.40	1.14

TABLE 5.2-6 IMPACTS TO NATIVE VEGETATION AND LANDFORMS			
Total	**508.54**	**549.69**	**643.79**

Direct and Indirect Impacts. Direct impacts to native vegetation communities and sensitive habitats during the construction of the project would include the removal of vegetation and the loss or disruption of native seedbanks. Exposure to dust, herbicides and hazardous materials could also occur. Indirect impacts to native vegetation communities and sensitive habitats would include type conversion along the proposed shaded fuel breaks, long-term alterations to hydrology, and degradation of habitat from invasive weeds.

Loss of Habitat and Type Conversion of Vegetation. The term "habitat" refers to the environmental and ecological conditions where a species is found. Wildlife habitat is generally described in terms of vegetation, though a complete explanation often must encompass further detail, such as availability or proximity to water; suitable nesting or denning sites; shade; foraging perches; cover sites to escape from predators; soils that are suitable for burrowing or hiding; limited noise and disturbance; and many other factors that are unique to each species. Vegetation itself provides many aspects of habitat, physical structure, and biological productivity and food resources for many wildlife species. Further, vegetation often reflects other habitat components such as regional climate, soil productivity and texture, elevation, and topography. Thus, vegetation is a useful overarching descriptor for habitat, and it is the primary factor in this analysis of impacts to wildlife habitat. When considering the loss of habitat, it is important to consider what types of habitats are present and how a given area is managed. For example, large tracts of undisturbed conifer woodlands that support a variety of different age classes and a complex understory can support broader species assemblages when compared to managed lands.

Most of the project area is dominated by managed stands of conifer woodlands that are subject to periodic logging when the stands reach a specific age class. The area located north of the existing PG&E transmission line corridor was replanted after the Fountain fire and is dominated by stands of by trees approximately 30 years old. More mature timber stands, and large recently logged areas occur south of the PG&E transmission line. These stands are intermixed with chaparral, small open meadows, and grasslands. Riparian vegetation is closely associated with wet meadows and the many streams and small drainages that occur across the project area. There are a few stands of large trees that would be removed however most of the impacts would occur in areas dominated by young timber stands or recently logged areas. Other timber stands would remain open to logging which would likely occur as the tress reach merchantable age classes.

Approximately 20 WTGs would be sited in the previously burned vegetation younger stands of conifer woodland. The remaining turbines occur in older stands or adjacent to recently logged areas.

Although young, early seral forests can play important roles to native wildlife. Such forests are generated by disturbances that reset successional processes and follow a pathway that is influenced by biological factors (e.g., large live and dead trees, downed logs, seed banks, resprout tissue, fungi, and other live and dead biomass) that were not removed during the initial disturbance (Swanson et al., 2011; Donato et al., 2012). Some areas support a fairly dense biomass of trees that were felled and left in place after the Fountain fire and provide a variety of habitat features and microhabitats for native wildlife. The removal of these habitats could have adverse effects on wildlife species that depend on forested areas for nesting, roosting, or refuge; however, open areas may also provide some beneficial effects for species that prefer these areas for foraging or other behaviors. In addition, for most of the project area the habitat is dominated by managed stands of timber which were planted for their commercial value rather than the intrinsic ability to support complex assemblages of plants or wildlife. In addition, as the project Area is managed for timber production it currently consists of a patchwork of recently logged areas which diminish habitat use for many forest species.

One component of the project is to clear large vegetation from around each turbine to reduce the risk of damage to the WTGs in the event of a wildfire. In addition, shaded fuel breaks would be created along some of the access and spur roads to each of the WTGs. These areas would be transitioned from conifer woodland and other vegetation types and maintained as a low scrub community. Type conversion occurs when vegetation communities are transformed into different ecosystem types in response to severe and frequent wildfires, drought, invasive species, climate, and other disturbances such as logging or vegetation management activities.

In many forests in California, there is increasing evidence that some montane habitats are not regenerating, particularly following stand-replacing wildfires (Collins and Roller, 2013). Instead, the dominant species on these landscapes are converting from mixed conifers to early seral sclerophyll shrublands (Collins and Roller, 2013). While the project would produce some similarities to this trend by promoting low-growing vegetation within around the WGs and in areas designated as shaded fuel breaks, it would also reduce the risk of long-term and large-scale effects of stand-replacing wildfires should a turbine catch fire r. These conversions could be locally detrimental in terms of preferred habitat for some species; however, the effects could also be beneficial for species that prefer low growing scrub communities. Similarly, as the area is managed for timber production it currently supports a wide variety of early and mid-seral stages of vegetation. The primary concern with managing these areas is to prevent the spread on invasive plants and promote low growing vegetation that provides habitat for native species.

The loss of native vegetation would be considered a significant impact under CEQA. To reduce impacts the Applicant would implement **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (Worker Environmental Awareness Program [WEAP]), **BIO-6** (Biological Resources Mitigation Implementation

and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-1** through **BIO-4** would require the applicant to hire and designate a qualified biologist and defines the duty of biologists and monitors for the project. **BIO-5** (WEAP) would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. It would also require conducting an abbreviated training for delivery truck drivers and vendors that are periodic visitors to the site. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. The condition includes limiting work to daylight hours, inspecting pipes and excavations, conducting pre-construction surveys, monitoring and many other protective measures. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species if they occur in a shaded fuel break, replanting oaks and or other riparian vegetation that is temporarily disturbed and providing compensatory mitigation for permanent impacts to riparian or sensitive vegetation communities. **FOREST-1** will protect timber resources which are used as habitat for a variety of wildfire. This measure requires the project owner to provide a fee payment to a land trust for the permanent conversion of 510 acres of Site Class I and II timberland to non-timber use at a one-to-one ratio. **FOREST-2** would ensure that forest regeneration is successful within the 548 acres of temporary disturbance (see **Section 5.17 Forestry** for additional information of forest regeneration as it relates to timber lands).

HAZ-7 would require the Applicant to create a Fuel Breaks Plan (FBP) with input from a wildland fire fuels specialist or local forester with wildfire prevention experience. This condition would augment **BIO-8** to balance restoration and fire prevention. **BIO-9** would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring.

Loss of Seedbanks. Construction activities could also result in the loss of native seedbanks. Seed banks can be defined as the storage of plant seeds in the superficial soil (Taiwo et al., 2018). Seed banks are a significant component of restoration and renewal of forest habitats. Their important functions include donation of propagules, conservation of genetic diversity, and propagation of understory plant community diversity. These functions are all dependent on the dynamics of a healthy seed bank coupled with favorable environmental conditions (Taiwo et al., 2018). The removal of native vegetation from riparian areas and non-managed lands would result in a reduction of the native seedbank. However, most of the project disturbances would occur to managed timber lands which were planted, and the existing native seed banks are likely compromised in many of the managed areas. Impacts are also expected to be limited where shaded fuel breaks and or managed areas around the WTGs overlap wet

meadows or riparian areas because these vegetation communities typically support vegetation that is consistent with managed fuel breaks. However, any loss of riparian vegetation would require mitigation. To reduce impacts the Applicant would implement **BIO-5** (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management Plan) **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction).

Changes to Hydrology. Construction of the project would require mass grading to construct the large access roads and WTG work areas. The Applicant indicated that new access roads would have a 40-foot-wide driving surface plus a 20-foot construction buffer on either side, resulting in an approximately 80-foot-wide disturbance area (FWPA, TN 248288-6). In some areas the cleared area could be up to 200 feet wide to accommodate significant cut and fill, stormwater controls, road design, and blade-delivery-vehicle turning radii (Ibid). The same dimensions would be required for the existing access roads.

The use of heavy machinery to remove vegetation, construct or widen access roads, complete culvert repair or replacement, as well as the removal of timber and other vegetation, would result in slope disturbance and loose soils. Removing forest cover also accelerates the rate that precipitation becomes streamflow. The removal or large stands of woodland can result in an increase in the volume of water flowing downstream during rain events. This can degrade adjacent habitat and impact riparian communities due to increases of sediment. These impacts can be locally detrimental and result in far ranging impacts to downstream areas depending on the quality of material that flows off the site.

To reduce these impacts the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. Where new culverts are proposed they would be designed to accommodate surface flows. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the State Water Resources Control Board (SWRCB) and would subsequently be required to prepare a construction Stormwater Pollution Prevention Plan (SWPPP), as discussed in further detail in Section 5.16 - Water Resources. The SWPPP would provide ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1** and **WATER-2** would ensure compliance with SWPPP requirements. **BIO-5** (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management Plan) and **BIO-11** (Conduct Biological Monitoring During Construction) would ensure workers are trained, restore temporarily disturbed areas and monitor compliance with regulatory permit conditions.

Damage or Degradation of Habitat from Dust. Construction activities such as grading, tower footing excavation, and driving of heavy equipment on unpaved roadways would result in impacts to vegetation from increased levels of dust that may settle on surrounding vegetation. Increased levels of dust on plants can affect the

plants photosynthetic capabilities, affect their productivity, nutritional qualities for foraging animals, and degrade the overall vegetation community.

During construction the Applicant indicated they would comply with air quality requirements and would be required to apply water or other approved tackifiers (FWPA, TN 248288-6). This would reduce fugitive dust and limit the amount of material that flows to offsite areas or adjacent undisturbed habitat. In addition, Staff recommends **AQ-SC3**, which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits.

Noxious or Invasive Weeds. Direct impacts to native vegetation could also occur if invasive or noxious weeds become introduced into an area or are spread from one area to another during construction or initial timber removal. For large scale construction projects, specialized equipment is often obtained from distant locations and earth moving vehicles can import weed seeds or invasive animals if they are not cleaned prior to use in a new area. The potential introduction or spread of invasive or noxious weeds into the Project Area would be related to the use of vehicles or equipment contaminated with nonnative plant seed. Weeds can also become established from local sources when new areas are disturbed, or native vegetation is removed.

Several invasive or noxious weeds, as defined by the California Invasive Plant Council (Cal-IPC) exist within or near the project area. Some species that are widespread and include Himalayan blackberry (*Rubus armeniacus*), chicory (*Cichorium intybus*), oxeye daisy (*Leucanthemum vulgare*), and rose campion (*Lychnis coronaria*). Bull thistle (*Cirsium vulgare*), yellow star-thistle (*Centaurea solstitalis*), Klamath weed (*Hypericum perforatum*), and others are also present. These species were commonly noted in the project area by the Applicant and are known to occur in managed timber lands. Invasive weeds threaten native vegetation communities because they can exclude native plants (including special status species occurring in the project area), alter habitat structure, increase fire frequency and intensity, decrease forage for herbivorous wildlife (including special status species), and decrease water availability for both plants and wildlife. Because the site is located adjacent to the LNF and in areas where weeds or invasive wildlife could be transported to downstream areas it will be important to manage the colonization or spread of non-native plants or wildlife.

The Applicant noted that several species of invasive or non-native weeds are present on the project site and in the broader project Area and indicated they pose a risk to riparian and wetland vegetation (FWPA, TN 248288-6) but did not suggest specific measures for their control. To prevent the spread or colonization of weeds staff recommends **BIO-5** (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management

Plan), **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction). These measures would educate workers to avoid parking in areas supporting noxious or invasive weeds, replace and restore native vegetation communities, and require the identification and treatment of weed infestations throughout the life of the project. The weed management plan would contain prescriptive measures including conducting preconstruction surveys and treatment of weeds prior to ground disturbance should the work occur when plants are visible.

Exposure to Herbicides and Other Hazardous Materials. Direct impacts to native vegetation could occur if they are damaged or destroyed in adjacent areas from exposure to herbicides during the initial vegetation clearing. It is expected that herbicides would be used to treat weed infestations, manage stumps, and control other large vegetation in the proposed WTG areas and the shaded fuel breaks. Construction activities would also include herbicide use on unwanted vegetation, including weeds, and invasive species. Broadcast herbicide application would not occur however, herbicides could inadvertently come into contact with native vegetation due to accidental targeting, overspray, or spills.

Herbicides are any chemical agents, taken from a broader spectrum of pesticides, which target the specific control or removal of plants. Many weed control programs rely heavily or solely on herbicidal methods, as these are often assumed to present the most efficient and cost-effective opportunities for eradication, especially of large populations. However, herbicides may harm or kill desirable native vegetation occurring near or even downstream from the targeted weeds. Additionally, herbicides may be detrimental to wildlife species such as amphibians (Relyea, 2005) or negatively impact water quality. The potential for runoff to streams will need to be determined on a site-by-site basis according to which biological resources are within each area. To minimize potential impacts, weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the CEC, and implemented by a Licensed Qualified Applicator who has been clearly informed of the nature of surrounding native vegetation. The Applicant shall avoid spraying non-target flowering plants and herbicides shall not be applied during or within 72 hours of a scheduled rain event. In riparian areas only herbicides specifically approved for use in wetland environments should be used where overspray could potentially be washed into watersheds. Herbicides shall not be applied when wind velocities exceed 5 mph.

Noxious weed control measures prescribed as mitigation should be species specific, and herbicides should be applied only if necessary, after considering alternate methods or as part of a proven eradication strategy for that weed species. Many weed species require specific timing or methods of herbicidal application (i.e., disturbing a protective waxy cuticle to allow uptake, applying herbicide after the plant has bolted but before seed set, etc.), and if such methods are not followed, it is likely native vegetation will

be harmed by herbicidal contamination while the target weed species are left unaffected.

While the overall benefits of herbicide use are generally straightforward, herbicide use may have detrimental effects on ecosystem values and functions. As noted in the CNPS Policy on the use of herbicides in situations where native vegetation may be affected, the tradeoff between the benefits and costs of using herbicide – either proven or alleged – has made it difficult for the public at large, CNPS members, other organizations, and public agencies to evaluate whether or not to use herbicides (CNPS, 2024). It is generally desirable to select an herbicide that has low toxicity, will not move from its target or leach into groundwater (low water solubility), and will not remain in the environment for a long period of time (low persistence). Furthermore, the application method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions and locations). Not all herbicides or application methods are equally appropriate, effective, or safe, given different site conditions and weed species.

There are several exposure scenarios possible for herbicides and wildlife. These include direct spray; indirect contact through grooming or contact with affected vegetation; and, ingestion of contaminated media, including vegetation, prey species, and water. Because of the relationship of body weight to surface area and to the consumption of food and water, small animals will generally receive a higher dose, in terms of body weight, than large animals will receive for a given type of exposure (Durkin, 2007). However, with the measures prescribed as mitigation, the potential for impacts to aquatic fauna will be minimized. For non-target terrestrial plants, the primary hazard is unintended direct spray or spray drift. Offsite drift typically depends on the droplet size and meteorological conditions. Other offsite exposure scenarios for vegetation include percolation, runoff, sediment transport, and wind erosion.

The use of herbicides would comply with regulations set forth by the U.S. Environmental Protection Agency (EPA) and California Department of Pesticide Regulation (CDPR). And when used properly have low risk to most species. Additionally, any herbicide use would be subject to the review and approval of the CEC. Although overspray may adversely affect some non-target species, the removal of noxious or invasive weeds and the control of existing populations would be considered a beneficial effect. To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a Spill Prevention Control and Countermeasures Plan (SPCC), **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected.

Increased Risk of Wildfire. The project has the potential to increase the risk of wildfire during construction. Wildfires can be initiated during vegetation removal, grading, welding, blasting, improperly storing oiled rages, or other activities that generate sparks or heat. Fires can also start if sparks occur when vehicles or equipment drive over rocks along access roads. Parking in dried vegetation or if workers improperly dispose of cigarettes or other flammable items can also result in fires. The Applicant has proposed several measures to reduce the risk of wildfires including the use of fuel breaks and other fire safety measures.

To reduce potential sources of ignition during construction staff proposes **HAZ-6** and **WORKER SAFETY-1** which includes a Fire Prevention Plan (FPP) and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS. For additional information on wildfire risk please refer to **Section 5.7** (Hazards, Hazardous Materials, and Wildfire). These measures include educating workers on the risks and sources of wildfires and ensuring that adequate firefighting tools and equipment are present during construction. Smoking will not be allowed in wildland areas and vehicles would carry basic fire tools including fire extinguishers. Non-emergency work would also be prohibited during Red Flag events which are weather events that are typically associated with elevated temperatures, low humidity, and wind.

Annosus Root Disease. During the clearing and grading of existing roads, WTGs pads, staging areas, and other locations the Applicant would cut or remove native trees. Cutting trees can expose otherwise healthy trees in adjacent areas to *Heterobasidion occidentale* and *Heterobasidion irregular*, the causal agents of heterobasidion root disease (formerly referred to as annosus root disease). Annosus root disease, is a fungus that attacks a wide range of woody plants causing a decay of the roots and butt and the death of sapwood and cambium. Interestingly, studies of controlled burns in coastal regions of the southern United States indicated that in some instances wildfires can reduce the potential spread of this fungus (Froelich et.al. 1971). All conifer species and many hardwood species in California are susceptible to the fungus. The fungus can become established in freshly cut tree stumps through airborne spores and then spread to remaining trees nearby through the conifer's root systems. The disease spreads outward, killing trees in a circular pattern until they reach barriers, such as openings or non-susceptible plants. Once heterobasidion root disease is established in an area, it is easily spread from freshly cut stumps to adjacent trees (Schmitt et al., 2000). The fungus can remain alive for as long as 50 years in the roots and stumps. Because the disease results in mortality of trees, it can create hazard trees, deplete vegetative cover, and result in adverse effects to wild land ecology.

One form of management for this root disease is prevention, including the treatment of freshly-cut conifer stumps with registered products such as Sporax or borate. The application of Sporax to freshly cut stumps greatly reduces the risk of infestation to adjacent conifers. Use of this product should not be conducted within 500-feet of streams known to support sensitive ranids (e.g., frogs). To reduce the risk of infection

or spread of this fungus Staff recommends **BIO-8** (Habitat Restoration and Vegetation Management Plan) which would require the Applicant to evaluate the risk of this fungus occurring in the project area and to treat stumps if needed.

Operation and Maintenance

Significant and Unavoidable Impact.

Basis for Conclusion. Operation and maintenance (O&M) would result in ongoing impacts to native and sensitive vegetations communities. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce most impacts to less than significant levels. However, staff's conclusion of a significant and unavoidable impact from O&M activities is based on the analysis presented in **Section 5.7** (Hazards, hazardous materials, and Wildfires). Based on substantial information in the proceeding's record as described in Section 5.7 the turbines would impose an obstruction that could impair aerial firefighting at the site (FWPA, TN 254875; FWPA, TN 254899). Should wildfires occur on site or come to the site during O&M activities they could spread to adjacent lands including the LNF and SNF. More importantly, should firefighting activities of such wildfires be hindered because of the large turbine heights and layout of the project it could contribute to stand replacing fires in adjacent lands including National Forest Lands. Even with the implementation of staff's COCs impacts would remain significant and unavoidable.

Background and Analysis. O&M activities associated with the project would result in direct temporary and permanent losses of native vegetation if vegetation clearing, grading, or other surface disturbance (e.g., driving over vegetation) is needed during O&M activities. This could occur when grading access roads, conducting culvert repairs, management of the shaded fuel breaks, or repair of WTGs. Use of access roads during O&M activities could result in indirect impacts to vegetation communities because of exposure to fugitive dust although fugitive dust impacts will be less impacting during this phase given the reduced number of vehicle trips as compared to the construction phase. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site.

O&M activities would result in ongoing disturbance to vegetation during the management of the shaded fuel breaks and to maintain open space around towers and other facilities. Staff could not find information on the exact methods or frequency of the vegetation management activities. However, typically vegetation is managed by a combination of mechanical and or chemical methods until the preferred vegetation communities are achieved.

Following the initial removal of timber herbicides would be applied to suppress tree regrowth and control noxious weeds and invasive species around the WTGs and in the

shaded fuel breaks. Approved herbicides would be applied by licensed applicators, most often through basal spray or stump treatment methods in accordance with required CEC and agency approvals. The nature and intensity of impacts associated with managing the shaded fuel breaks and the areas around the WTGs will vary based on the timing, frequency, and methods. Manual vegetation removal methods would require more frequent treatments to control unwanted vegetation and weeds. These methods can include mowing, chipping, and hand clearing.

Herbicide use would substantially suppress vegetation regrowth, reduce the intensity of future vegetation management, increase time between removal treatments, and further optimize the reduction of fuel loads and fire risk compared to not using herbicides. Because of the need for less intense and less frequent vegetation management, herbicide use would lower environmental disturbance, decrease the generation of vegetation that would build up over time, and expedite reaching the desired conditions where fire hazards would be reduced.

To reduce impacts the Applicant would implement **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan), **AQ-SC3**, **AQ-SC4**, **WATER-1**, **WATER-2**, **HAZ-1**, **HAZ-6**, **COC HAZ-7**, and **WORKER SAFETY-1**. Even with the implementation of staffs COCs impacts would remain significant and Unavoidable due to wildfire risk.

Risk of Wildfires During O&M. Operation of the WTGs could result in the risk of wildfires should a turbine malfunction or be struck by lightning. Use of access roads during O&M activities could also result in the initiation of wildfires if vehicles are parked in low grasses or shaded fuel breaks. Wildfires can also be initiated during mechanical vegetation treatments. To reduce this risk the Applicant has proposed a series of shaded and non-shaded fuel breaks to reduce the spread of fires on the project site. Fuel breaks would be constructed along access roads, the aboveground and underground collector lines, and around the turbines and other project components (FWPA, TN 254350). Non-shaded fuel breaks would correspond to the permanent disturbance footprint for access roads, collector lines, turbine pads, and all other project components with permanent footprints and the associated cleared areas (FWPA, TN 254350). In addition, **HAZ-6** (Fire Prevention Plan), **HAZ-7** (Fuel Breaks Management Plan), and **HAZ-8** (Site Water Supply Plan) would require the management of vegetation, implementation of fire protection and suppression methods, and developing a plan to determine the volume, number, and location of water tanks to support fire suppression on the project site.

Although these conditions would reduce the risk of wildfires starting during O&M activities, the physical layout of the project could hamper aerial firefighting should a fire start at or near the facility. In **Section 5.7** (Hazards, Hazardous Materials, and

Wildfire) staff noted that based on substantial evidence turbines would present an obstruction impairing aerial firefighting at the site (FWPA, TN 254875; FWPA, TN 254899). Should wildfires be initiated during O&M activities they could spread to adjacent lands including the LNF or SNF. More importantly, should firefighting activities be hindered because of the large turbine heights and layout of the project it could contribute to stand replacing fires in adjacent lands including National Forest Lands. Should this event occur, it could result in significant loss of habitat and could alter vegetation communities in the region.

Fires are common disturbances in many ecosystems and can provide beneficial effects under typical conditions. Historically, mixed-severity fires created a mosaic of different habitat conditions across the landscape. Many habitats, such as chaparral and coniferous forests, have evolved with fire as an essential contributor to habitat vitality and renewal. However, fire suppression over the last century has resulted in increased understory fuel loads and tree density. This change in structure has caused a shift from low- to high-severity fires in California. Although fuel limitations were a key factor that limited fire size and severity historically, these limitations have been largely removed from many contemporary landscapes, thus increasing the potential for large high-severity fires, particularly in a warming climate (Halofsky et al., 2020). Regeneration across some particularly vulnerable forest types, such as dry coniferous and high-elevation forests, could be challenging as seed availability can be low due to large high-severity fires (Halofsky et al., 2020). Moreover, severe fires, resulting in greater tree mortality, have led to a reduction in forest carbon stability (Hurteau and Brooks, 2011). Forests sequester carbon from the atmosphere, and in doing so can mitigate the effects of climate change (Pacala and Socolow, 2004). High-severity fires can also have detrimental effects on nutrient cycling caused by heat, ash additives, altered microclimate, and changed vegetation dynamics, which may be of short- or long-term duration (Raison et al., 2009).

Although wildfires are a natural part of forest ecosystems and are often beneficial in some circumstances; stand replacing fires and large mega complex fires can kill even large trees and permanently alter landscapes. Staff considers it likely that a wildfire will occur in the region based on the existing fire history See **Section 5.7** (Hazards, Hazardous Materials, and Wildfire) for information on the fire history of the region. Should the operation of the project hinder firefighting and allow the fire to spread onto adjacent timber plots, National Forest Service lands, or grow into a stand replacing fire it would result in significant and unavoidable impacts to vegetation.

To reduce impacts the Applicant would implement **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan), **AQ-SC3**, **AQ-SC4**, **WATER-1**, **WATER-2**, **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and

WORKER SAFETY-1. With the implementation of these COCs impacts would be reduced but would remain significant and unavoidable due to the risk of wildfires.

b. 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 Wildlife or U.S. Fish and Wildlife Service?

Special-Status Plants

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. State or federally listed plant species were not identified in the literature review or detected during the botanical surveys. Construction may impact some special status plants that have the potential to occur however most of the area consists of managed timberlands where sensitive plants were not detected by the Applicant. Should sensitive plants be detected during future surveys impacts would be reduced by the implementation of Staffs proposed COC's.

Background and Analysis. Two federally listed plant species Greene's tuctoria and slender Orcutt grass are known from the region, however, these species are closely associated with vernal pool ecosystems which were not documented on the project site. Federally designated critical habitat for slender Orcutt grass is located approximately 6.0 miles (9.7 km) north of the project site near a vernal pool complex.

Several other sensitive plant species have a moderate to high potential to occur based on habitat conditions however they were not detected during surveys conducted by the Applicant. These include several long-haired star-tulip (CRPR: 1B.2), Callahan's mariposa-lily (CRPR: 1B.1), rattlesnake fern (CRPR: 2B.2), scalloped moonwort (CRPR: 2B.2), Mingan moonwort (CRPR: 2B.2), northern clarkia (CRPR: 4.3), Butte County fritillary (CRPR: 3.2), and English Peak greenbriar (CRPR: 4.2). Butte County morning-glory (CRPR: 4.2), was detected south of Highway 299 and has the potential to occur in the project area (FWPA, TN 248308-7; FWPA, TN 248308-8).

Most of the project area has been managed for timber production and the area is subject to a cycle of logging, planting, and weed management. Large open areas that have been recently logged and stands of recently planted conifers are also present. This cycle of disturbance has likely resulted in the reduction of native seedbanks and may limit the potential for some rare plants to occur. However, sensitive plants may still occur in the seedbank or in adjacent habitat. The initial surveys were conducted in 2018 and 2019 and did not fully follow CDFW floristic survey guidelines. No reference populations were checked, and the surveys did not cover all the same areas. At the request of the CEC the Applicant conducted spot checks for rare plants in 2023 in areas

supporting suitable habitat. Sensitive plants were not detected during these surveys (FWPA, TN 253167).

Direct and Indirect Impacts. Direct impacts to state-listed plants are not expected to occur. Direct impacts to other special-status plant species could include the removal or destruction of plants, loss of habitat, disturbance to seed banks, vibration, and exposure to herbicides and fugitive dust. Impacts from herbicide treatment to manage conifer stumps, seedlings and other trees identified for removal and could result from misuse or accidental contact, which may kill or damage non-targeted vegetation. Indirect impacts could include a degradation of habitat or displacement in adjacent areas from the introduction and spread of invasive noxious weeds resulting in unsuitable habitat conditions, preventing native recruitment, and altering fire ecology. Impacts to sensitive plants would closely resemble impacts to native vegetation and landforms described above.

Removal of Habitat and Direct Loss of Plants. Construction activities would primarily occur in early seral managed timber stands, recently logged, or burned areas, and areas with limited potential to support rare plants. Most the project site and broader area is actively logged for timber and has been subject to a series of fires, planting, and timber harvest. There is a low to moderate potential to detect plants in these areas. The most likely area to detect rare plants is within the wet meadows, along road edges, and near riparian areas that have been subject to less disturbance. However, some species of rare plants prefer open edge areas and could colonize these areas.

Habitat for special-status plants, particularly those closely associated with riparian habitats, could also be adversely affected during access road improvements where new roads would require the placement of culverts or other crossings. These activities could remove plants and result in elevated levels of erosion and sedimentation or exposure to fugitive dust. The most likely risk to sensitive plants and their seedbanks is from mass grading of roadways and clearing required around the WTGs. Plants could be subject to loss or adversely affected in adjacent habitat from dust or damaged from off-site sediment transport during storm events.

The destruction or removal of any state or federally-listed plant species would be considered a significant impact without mitigation. However, state or federally listed species were not detected, and impacts are not expected to occur. Should they be detected in future surveys Staffs COC's for other sensitive plants would provide protection for the occurrence and impacts would not be authorized without further coordination with the CEC and CDFW depending on the nature of the impacts (e.g., avoidance or direct loss). Impacts to a small number (i.e., a few individual plants) of non-listed special-status plants or impacts where the loss of a population would not negatively affect the range of the special-status plant species would not be considered a significant impact. Impacts would be considered significant without mitigation if project activities result in the loss of more than ten percent of the known individuals

within plant species occurrences designated as CRPR 1.B or 2. Therefore, the loss or modification to occupied or suitable habitat or the direct loss to these species would be considered a significant impact.

The Applicant and CDFW have proposed mitigation measures to reduce impacts to sensitive plants and these actions have been incorporated into Staffs recommended **COCs**. To reduce impacts the Applicant would implement **BIO-12** (Special-Status Plant Avoidance Measures), which would include conducting pre-construction surveys and establishing avoidance buffers for any sensitive plants. In addition, the measure contains seed collection and other salvage efforts should thresholds of disturbance (e.g., Impacting State or federally listed plants or more than 10 percent of a local occurrence of a CRPR 1B or 2 species) occur. In addition, **BIO-5** (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management Plan), and **BIO-4** (Conduct Biological Monitoring During Construction) would be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species if they occur in a shaded fuel break, replanting oaks and or other riparian vegetation that is temporarily disturbed and providing compensatory mitigation for permanent impacts to riparian or sensitive vegetation communities. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring.

Impacts from exposure to fugitive dust would be reduced by **AQ-SC3**, which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits. To reduce impacts from sediment or from changes to hydrology the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the SWRCB and would be required to implement a SWPPP. The SWPPP would ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1**, **WATER-2,** and **WATER-5** would ensure compliance with SWPPP requirements.

Exposure to Herbicides and the Spread or Introduction of Weeds. Direct impacts to sensitive plant species could occur if they are damaged or destroyed from exposure to herbicides during the initial timber harvest and vegetation clearing. Herbicide use would occur on unwanted vegetation, including weeds, invasive species, and tree stumps. Broadcast herbicide application would not occur for the proposed

project however, herbicides could inadvertently come into contact with sensitive plant species due to accidental targeting, overspray, or spills. Indirect impacts to sensitive plants could occur if invasive weeds are introduced and or proliferate in the project area. Infestations in adjacent habitats can influence soil chemistry and hydromorphic characteristics. The proliferation of invasive weeds can also increase the risk of wildfire or displace native vegetation in other habitat types, reducing sunlight and access to soil moisture.

Exposure to herbicides and other hazardous chemicals or introduction and spread of invasive weeds would be considered a significant impact under CEQA. To reduce these impacts Staff recommends **BIO-9** (Integrated Weed Management Plan) which would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation. It would also specify that herbicides would not be used within 25-feet of any sensitive plant. To reduce potential exposure to hazardous materials and limit sources of ignition during construction staff proposes **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1** which includes spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS.

Implementation of the proposed project is not expected to result in direct or indirect impacts to state or federally listed plant species. However, it is possible that impacts to other species status plants could occur. These impacts would be considered significant under CEQA. To reduce impacts Staff recommends the implementation of **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-12** (Special-Status Plant Avoidance Measures), **AQ-SC3**, **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7**, and **WORKER SAFETY-1**. With the implementation of these COCs impacts would be reduced to less-than-significant.

Operation

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to sensitive plants. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction

activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to fugitive dust, and herbicides. Use of access roads during O&M activities could result in indirect impacts to vegetation communities because of exposure to fugitive dust although fugitive dust impacts will be less impacting during this phase given the reduced number of vehicle trips as compared to the construction phase. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site.

Sensitive plants could also be impacted in areas proposed as shaded fuel breaks. Vegetation management activities would remove large woody trees, and the areas would be managed as a low growing scrub community or grasslands. While the transition to early seral vegetation communities may adversely affect habitat for some special-status plants, other species associated with low-growing, native habitats could be beneficially affected as edge areas commonly support sensitive plants that are reliant on higher light levels not always present in dense conifer woodlands.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for vegetation and landforms and could increase during the O&M phase of the project. Wildfires have varying degrees of impacts to sensitive plants depending on the species ecology, and the timing and intensity of the fire. For example, many annual plants are fire or disturbance followers and could benefit from reduced canopy cover provided the intensity of the fire does not destroy the seed bank. Other perennial species could be removed, and the occurrence destroyed. High intensity wildfires could also alter soil conditions which could adversely affect rare plants. Weeds could also proliferate following a large wildfire which could outcompete native species. Another important consideration is the frequency of the fires in the region. Repeat short interval fires can also result in type conversion from scrub to weedy grassland species.

To reduce this risk the Applicant has proposed a series of shaded and non-shaded fuel breaks to reduce the spread of fires on the project site. Fuel breaks would be constructed along access roads, the aboveground and underground collector lines, and around the turbines and other project components (FWPA, TN 254350). Non-shaded fuel breaks would correspond to the permanent disturbance footprint for access roads, collector lines, turbine pads, and all other project components with permanent footprints and the associated cleared areas (FWPA, TN 254350). In addition, **HAZ-6** (Fire Prevention Plan), **HAZ-7** (Fuel Breaks Management Plan), and **HAZ-8** (Site Water Supply Plan) would require the management of vegetation, implementation of fire protection and suppression methods, and developing a plan to determine the volume, number, and location of water tanks to support fire suppression on the project site. In addition, staff recommends the implementation of **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan), **BIO-**

11 (Conduct Biological Monitoring During Construction), **BIO-12** (Special-Status Plant Avoidance Measures), **AQ-SC3**, **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7**, and **WORKER SAFETY-1**. Because wildfires have such different outcomes it is difficult to predict the impacts to sensitive plants in adjacent habitats should fire prevention measures be hindered by the construction and operation of the project. Staff concludes that for rare plants the implementation of these COCs impacts would reduce impacts to less-than-significant.

Common Wildlife

Construction

Less Than Significant Impact.

Basis for Conclusion. Common wildlife is not typically afforded protection under CEQA but have been considered based on their intrinsic value and role in ecosystem health. Although not required, the implementation of staffs recommended COC's for other wildlife would provide a variety of mechanisms to reduce or minimize impacts to common wildlife through worker training, monitoring, and habitat restoration.

Background and Analysis. The project area supports a variety of common wildlife species. It is likely that many of these species, especially fossorial, or slow-moving species would be subject to loss or injury during construction. Direct impacts to wildlife could include mortality from vehicle collisions, crushing from heavy equipment, entrapment, disruption of behavior (e.g., breeding, movement, foraging) from noise, vibration, or human presence, degradation or loss of foraging habitat, changes in hydrology, exposure to herbicides or other hazardous materials, and exposure to fugitive dust. Common wildlife could also be impacted from the use of explosives during the excavation of footings in rocky soils.

Habitat Removal. Removing vegetation for the WTGs would displace common wildlife that rely on these habitats. Displacement will likely result in mortality or decreased fitness for some species while other generalist species may benefit from preying on displaced animals or from increased foraging opportunities that will exist within the early seral communities that form in shaded fuel breaks and around WTGs. On a localized level these impacts may be severe but most common species occur in relative abundance and utilize a variety of habitat types. Impacts would be relatively low compared to the range and acreage of habitat region wide as many species, including raptors and large mammals, typically forage over wide areas. Impacts to animals with smaller ranges, and those that prefer densely forested habitats for foraging, would be more substantial.

Direct Mortality or Displacement. Construction of the project would result in mortality or injury to wildlife from vehicle or heavy equipment use, particularly if slow-moving or sedentary animals occur in the path of vehicles or equipment or along road edges. Ground-dwelling invertebrates, diurnal reptiles, and small mammals are the most

likely species to be subject to mortality or injury from vehicles and equipment. Where access roads intersect riparian areas, aquatic invertebrates and amphibians could be subject to injury or mortality from similar impacts. Amphibians can be particularly vulnerable to crushing because many species disperse across uplands between aquatic resources, are small and inconspicuous, and are usually slow-moving. This type of mortality can have detrimental effects on local populations if the loss is continual (Trombulak and Frissell, 2000) however that is not expected to occur because of the project. Construction activities could disrupt deer migration or fawning areas. It is likely that deer would avoid active construction areas but could still forage along the margins of the access roads or previously disturbed areas. It is likely that deer and other more mobile species, such as birds and larger mammals would be expected to disperse into nearby habitats during initial construction activities.

Common wildlife could also be subject to mortality on Highway 299 due to the increased vehicle traffic required to bring in supplies and equipment. As the water supply for the project is currently uncertain it is possible that the Applicant would be required to truck in large amounts of water from off-site sources. This would substantially increase road traffic which is known to result in roadkill to a suite of wildlife species. Even birds are at risk especially during crepuscular periods associated with dawn and dusk. Large mammals such as deer are often subject to roadkill in rural areas when animals are moving between foraging areas. Trombulak and Frissell (2000) determined that animal behavior can be altered by the presence and use of roads through modified movement patterns and reproductive success and increased physiological stress. For example, mule deer in Colorado prefer areas more than 200 meters from roads and mountain lion home ranges typically occur in areas with low densities of dirt roads. However, turkey vultures and black vultures were found to select home ranges with higher road densities, presumably for the increased carrion due to roadkill.

Maintenance and use of access roads, particularly in areas used by nesting birds or near water sources, can adversely affect wildlife by disrupting breeding, foraging, and movement. Wildlife species are most vulnerable to disturbance during their breeding seasons. These disturbances could result in roost, den, or territory abandonment and subsequent reproductive failure if they were to occur during the breeding season.

Elevated noise from equipment, vehicle traffic, helicopters, and increased human presence could result in changes to wildlife behavior. Wildlife in or near work areas could be adversely affected if activities disrupt normal behaviors, such as movement, breeding, and foraging. Common species that are more associated with densely forested habitats are expected to disperse into adjacent areas. Dust generated during construction could also adversely affect wildlife species in habitats within or adjacent to work areas. Dust can smother small organisms and reduce the quality of wildlife habitat, if excessive.

Effects of Blasting on Wildlife. Blasting results in a series of impacts to wildlife. These include noise, vibration, dust, chemical fumes and residue, displacement of rock or soil, and overpressure. Species that occur within the blast area could be subject to direct mortality or injury. The proximity to the center of the blast zone and the type of species is a function to how an animal either reacts or is harmed. Blasting for foundations and to cut roads can be conducted in several different ways but often requires the placement of blasting compounds within drilled cavities in the rock or soil. When the charge is detonated the parent material is fragmented and becomes more easily removed by construction equipment. The applicant states that if blasting were to occur, it would be guided by a detailed blasting plan (FWPA TN#248290-1). The plan would include outlining the anticipated locations for blasting, defining specific times and permissible distances for the use of explosives, and ensuring compliance with all relevant federal, state, and local regulations to reduce environmental impacts, (FWPA TN#248290-1). The Applicant indicated that blasting that lasts less than 20 seconds can produce noise levels approximately 94 dBA at 50 feet. It was noted that blasting can occur between one and ten times per day (FWPA TN#248288-15). The Applicant indicated that at a distance of 5,000 feet (or nearly one-mile), which is the closest residence to the potential blasting site, the blasting would generate approximately 54 dBA Leq—12 dBA Leq above the ambient noise level.

At closer levels this noise would be considerably louder and would likely disturb local wildlife. Blasting conducted near rivers and streams could also result in disturbance or harm to aquatic species. In a study conducted by the Federal Highway Administration (FHWA) they found that the stress pulsing of the rock creates three types of disturbances, or wave motions, when blasting in and around bodies of water. These include ground vibrations, air overpressure, and water overpressure when blasting on land next to water or under water. When blasting takes place under a deep-water column, air overpressure to the atmosphere may be absent due to excessive confinement. During land and underwater blasting, ground vibrations travel along the rock surface and within a water body substrate in the form of particle velocities. Water overpressures can be generated from the pulsing of water when ground vibrations reach a rock-water interface or directly from underwater blasting when the rock is quickly accelerated against the water column. With respect to rock blasting effects on fish, substrate vibrations and water overpressures are most relevant (FHWA 2019). That same study concluded that it is difficult to predict how blasting affects fish in most circumstances. Staff is not aware if any blasting is proposed in or near any of the small creeks and drainages but acknowledges that some impacts could occur from noise, debris, or overpressure depending on the location of the work.

Staff considers blasting to have the potential to disrupt animal behavior similar to other construction activities and could startle species well outside of the project area. In addition, the Applicant indicated that blasting would occur on an infrequent basis and for short durations. Staff recommends that blasting be conducted outside the bird breeding season which would also reduce the potential to disturb common mammals, amphibians, and reptiles (See impacts to avian species below). Except for non-special

status birds which are protected by state and federal regulations, discussed below, the injury or mortality to common wildlife would be adverse but less than significant. Nonetheless, impacts to these species would be minimized through the application of mitigation measures described for nesting birds and other species. These measures provide for habitat restoration, conducting surveys, monitoring, and allowing wildlife to move out of harm's way during construction, among many other requirements. In addition, although not required for common species of wildlife **NOISE-6** limits heavy equipment operation and noisy construction work relating to any project features, including linear facilities, helicopter operation, and rock blasting to a period of Monday through Saturday between the hours of 7:00 A.M. to 7:00 P.M. Specific conditions related to blasting would be required for other species and would include seasonal timing, pre-construction surveys, scare charges or warning horns, species relocation and monitoring.

Operation

Less Than Significant Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to common wildlife. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to noise, fugitive dust, and herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. Common wildlife using these areas would be subject to displacement or mortality depending on the specific O&M activity. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site. Wildlife would also be subject to new baseline noise levels and vibration from the operation of the turbines. Noise would emanate from the turbine blades whenever they are operational. The turbine's noise level is approximately 56 dBA, at the base of the turbine which is slightly higher than the daytime and nighttime ambient noise level of 42 dBA per day. This could result in predator masking in some circumstances. Vibration from the WTGs is expected to be minimal and would be damped within a short distance. See **Section 5.9** (Noise and Vibration) for a more thorough discussion of this topic.

Operation of the wind farm may also change foraging dynamics across the turbine fields. Windfarms are a known source of mortality for insects, birds, and bats. It is likely that small to midsize carnivores and predatory birds will forage on the remains of species killed or injured by the WTGs, guy wires, and met towers. These species may

become accustomed to foraging in the area which could increase the number of mesopredators which can increase predation risk to both common and special status aquatic and terrestrial species.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for vegetation and landforms and could increase during the O&M phase of the project. The key concern for staff is how the location and design of the project hinders aerial firefighting in the project site and in the surrounding area. Wildfires affect wildfire in a variety of ways and can range from beneficial to adverse depending on the intensity, scale, and frequency of the event. Below is an overview of fire related impacts to wildlife.

Terrestrial Invertebrates. Although some terrestrial invertebrates are not adversely affected from the effects of fire, it can have a devastating impact on many other invertebrate species, not only killing them directly, but leading to long-term indirect effects such as stress, loss of habitat, territories, and food. The loss of key organisms in forest ecosystems, such as invertebrates, pollinators, and decomposers, can significantly slow the recovery rate of the forest (Boer, 1989). Similarly, invertebrates from caddisflies to slugs to bees and butterflies are likely negatively affected, but we still have much to learn about the effects on these populations (Xerces Society, 2020).

Numerous studies have found negative responses of gastropods to fire. According to Burke et al. (1999), high-intensity fires are particularly damaging to gastropod populations as it destroys snails and their habitats. A five-year study examining the survival of mollusks in burned aspen groves following fires in Yellowstone National Park found fire to have a major impact on snail survival and abundance (Beetle, 1997). One severely burned site had only burned shells the first year following a fire and continued to support no live snails after 5 years. Two lightly burned sites with hospitable conditions (e.g., damp habitat, abundant litter, uncharred/charred rotten logs) maintained snail populations over the five-year period, but species richness did not increase over that time, and no evidence of migration into burned areas was identified. Once extirpated from a site, populations of most gastropod species are slow to recover. Sites that appear to be suitable snail and slug habitat, but which have been burned in the past, are reported to support few if any species or individuals even after 50 years or longer (Jordan and Black, 2015).

While some studies have identified the benefits of fire for monarch butterflies, previous studies have provided mixed results on the effects of burning on butterflies (Baum and Sharber, 2012). Prescribed strategies that patchily apply fire to the landscape generate a mosaic of vegetation with different fire return intervals. A heterogenous application of fire has the potential to benefit a variety of butterfly species with differing habitat requirements and responses to fire (Fuhlendorf and Engle 2004 in Baum and Sharber, 2012). However, the timing and frequency of prescribed fire plays an important role in its effect on the overall butterfly community (Baum and Sharber, 2012). Milkweed, the

sole food source for monarch caterpillars, quickly regrows after summer burns, during the time frame in which it normally senesces under normal conditions.

Aquatic and Semiaquatic Species. Wildfires influence aquatic ecosystems both directly and indirectly. High intensity wildfire impacts to aquatic systems that result in, direct mortality and habitat destruction are considered to be the most detrimental. These include mortality and injury of aquatic and semiaquatic animals, such as freshwater mollusks, amphibians, and fishes, caused by fire through raising water temperatures to lethal levels, possible toxic effects caused by fire-induced changes to stream pH, and acute levels of toxic chemicals (Gresswell, 1999). Substantial indirect effects include post-fire erosion leading to increased sediment loads and debris flows.

As a group, amphibians are taxonomically and ecologically diverse; in turn, responses to fire and associated habitat alteration are expected to vary widely among species and among geographic regions (Pilliod et al. in press). Available data suggests that amphibian responses to fire are spatially and temporally variable and incompletely understood, and information of the long-term negative effects of fire on amphibians and the importance of fire for maintaining amphibian communities is sparse for the high number of taxa in North America (Pilliod et al., in press). In a review of the current literature, Hossack and Pilliod (2011) tried to determine if there are patterns that might be informative for conservation and management strategies. Of the seven studies that compared pre- and post-wildfire data on a variety of metrics, ranging from amphibian occupancy to body condition, two reported positive responses and five detected negative responses by at least one species. All four studies that included plethodontid salamanders reported negative effects on populations or individuals. These effects were greater in forests where fire had been suppressed and in areas that burned with high severity.

Given their diversity and complexity in terms of life cycles, many amphibians have evolved and persisted in fire prone regions, possibly due to adaptations to fire disturbances. Some pond-breeding species in forests with high frequency fire regimes rely on the heterogenous landscapes and open conditions created and maintained by fire for long-term population stability (Dodds et al., 2015). Conversely, species that have narrow geographic distributions, are closely tied to specific microhabitat conditions (e.g., soil or water temperatures or cover types), or occur in areas with very long fire-return intervals that may be adversely affected by fire. Although most amphibians breed in aquatic environments, they may be particularly vulnerable to fire-related mortality and habitat disturbances during periods spent in upland environments (Pilliod et al. in press). Even if individuals can avoid fire by occupying wet areas or moving underground, migratory routes back to breeding ponds may no longer be suitable. Fire-related disturbances at the microhabitat level may include the elimination or alteration of important amphibian cover through combustion of understory vegetation and surface materials or filling interstitial spaces in aquatic substrates with ash and sediment. On a broader macrohabitat level, such as lakes or streams, fires may increase solar radiation

and water temperatures, alter hydroperiods and nutrient cycling, and enhance productivity (Pilliod et al. in press).

Intense fires and related events have killed fish and even caused local extinctions (Dunham et al., 2003). Conceivably, large, and intense fires could further threaten populations of sensitive salmonids such as Chinook and Coho salmon, steelhead, and others that are already depressed from other factors. While those species do not occur at the project site, they do occur in downstream areas which could be affected by a large complex fire.

The impacts of wildfires on stream temperatures are not well understood. However, Beakes et al. (2014) provides some data regarding alterations to post-fire stream water temperatures and the effects to steelhead. Water temperatures were analyzed following a wildfire in 2009 that burned a major tributary of the Scott Creek watershed in central California. One year after the fire, mean daily stream temperatures were elevated by up to 0.6°C (Celsius) in burned areas compared to unburned pools. Among burned pools, light flux explained over 85 percent of the variation in altered stream temperatures, and 76 percent of the variation in light flux was explained by an index of burn severity based on proximity of the pool to burned streamside. This study demonstrated that wildfires could generate thermal heterogeneity in aquatic ecosystems and drive short-term increases in stream temperature, exacerbating stressors for cold water fishes. Post-fire landscapes that lack vegetation and cover can also pose hazards due to increased sediment load delivery to streams during large storm events. High sediment loads can alter channel structure and reduce available salmonid habitat. After the Basin Complex Fire of 2008, where approximately 84 percent of the Big Sur watershed burned at moderate to high intensity, the response of the watershed was monitored (Lanier, 2011). The results indicated an increase in fine sediment throughout sampling sites along the Big Sur River even after the theoretical timeframe of post-fire sediment yield of 1 to 3 years. The increase in fine sediment can cause a loss of benthic macro-invertebrates, the primary food source for steelhead and other fish species (Ramezani et al., 2014).

Reptiles. Because of the need for thermoregulatory, foraging, and refuge sites, reptiles are highly dependent on habitat structure and fire has been shown to reduce their abundance and limit movements (Setser and Cavitt 2003; Valentine et al., 2012). Wildfires can adversely affect reptiles from type conversion of diverse scrub and chaparral habitat into less diverse grasslands. As the vegetation becomes less diverse, reptile diversity can decline. Some results have indicated that burned chaparral and coastal sage scrub lost herpetofauna species diversity after fires and displayed a significant shift in overall community structure due to susceptibility to initial fire mortality, the response to the altered post-fire habitat, and shift in the availability of potential prey (Rochester et al., 2010). This may be the case for the project area after the Fountain Fire burned through most of the site.

The impacts of wildfires may also pose long-term physiological effects to some reptile populations. For example, rattlesnakes that were tracked using radio telemetry in different burned areas did not exhibit any avoidance of burned habitat during tracking periods following the Carlton Complex Fire of 2014 in north central Washington (Chase, 2017). However, snake populations in dens affected by the fire showed a size structure that was significantly skewed toward smaller individuals than those dens outside of the fire area.

Birds. Most birds are highly mobile and can move away from immediate fire hazards. However, even as most birds fly out of forests, woodlands, and other habitats that are burning, that movement alone is a stressor as they must then compete with resident birds for limited resources in new habitat areas. In general, there is a high turnover of avian species after high-severity fires, with a shift primarily from canopy-dwelling to ground-, shrub-, and snag-dwelling species that mostly are not associated with other successional seral stages (Huff et al., 2005). Fire apparently reduces the total food available for birds, but increases the kinds of food, especially at or near the ground (Apfelbaum and Haney, 1981). Foliage dwelling birds, such as olive-sided flycatchers have been documented foraging at twice the frequency in unburned areas as opposed to burned areas, which has partially led to negative effects on reproduction as a consequence of reduced food availability in burned areas (Meehan and George, 2003).

If fires burn during the nesting season, birds could be forced to abandon nests sites which could result in the loss of eggs or nestlings depending on the intensity of the fire. This could be more impactful to birds that nest on the ground or in low vegetation unless the fire is high intensity and stand replacing.

Mammals. It is generally agreed that direct mortality from fire is typically very low among most mammals and does not significantly influence populations. However, indirect responses such as post-fire occupancy, abundance or density, survival, reproduction, and use of habitat (e.g., breeding, resting, foraging) can present mixed results (Bond, 2015).

Small mammals have comparatively small home ranges, and therefore, are quite sensitive to habitat change (Haim and Izhaki, 1994). During intense fires, some individuals among small, less vagile animals may suffer direct mortality, but many others survive in rock crevices, riparian areas, large, downed logs, and underground burrows where temperatures remain cool and the air clean (Quinn 1979). After an intense wildfire, small mammal communities are dynamic and associated with vegetation structure at different successional stages (Bond, 2015). Following a fire, small mammal communities change over time and space, depending on the vegetation associations of the various species. Species preferring open habitat, such as some mice and voles, can increase quickly and dramatically following severe fires (Borchert and Borchert, 2013; Schwilk and Keeley, 1998). While some studies have shown that severely burned conifer forests in North America support fewer individuals of some rodents and insectivores immediately after fire compared with adjacent unburned sites,

numbers begin to rebound several years after fire, often by individuals surviving in unburned refuges within the larger burn perimeter (Borchert, 2014; Zwolak and Foresman, 2007).

Wildland fires can create an abundance of roosting sites for forest-dwelling bat species, such as little brown bat and long-eared myotis (Bond, 2015). In mid-elevation forests burned at mixed and high severity in western Montana, Schwab (2006) noted that these species preferentially roosted in larger-diameter snags in high-density stands of fire-killed trees. While most of the project site does not support large snags of trees, they are present in adjacent forest lands particularly in the SNF and LNF. Mixed- and high-severity fire in forest ecosystems also likely enhances foraging opportunities for bats (Buchalski et al., 2013). Many insect species inhabiting coniferous forests have highly evolved through adapting sensory organs or life strategies to exploit severely burned forests and in turn can create a superabundance of native insect prey for bats.

As major herbivorous components of ecosystems, ungulates can act as keystone species with profound effects on vegetation development and productivity in forests, woodlands, and grassland ecosystems (Hobbs, 1996; Wisdom et al., 2006). Hobbs (1996) stated, “ungulates are not merely outputs of ecosystems, they may also serve as important regulators of ecosystem processes at several scales of time and space.” Episodic disturbance agents such as fire strongly interact with ungulate herbivory over space and time (Bond, 2015). The applicant noted that the project site is used as foraging habitat for deer.

The effects of high-severity fire on ungulates are likely most pronounced in vegetation types that are most adapted to high-intensity fires, such as aspen forests and shrublands. For example, mountain or bighorn sheep selected intensely burned shrublands up to 15 years after fire in Montana and southern California mountains (DeCesare and Pletscher, 2006; Bleich et al., 2008). This may be attributable to increased green forage availability, shifting diet composition to include more forbs, and decreased predation risk from mountain lions by increasing visibility (Green et al., 2012). Similarly, mule deer in central coastal California strongly preferred burned habitat, with a 400 percent increase in the density of deer in prescribe-burned chapparal near oak woodlands, relative to pre-burn density.

Carnivores are critically important regulators of ecosystem processes. Elimination of a top carnivore from an area unleashes a cascade of adverse effects, including relaxation of predation as a selective force on prey species, spread of disease, explosions of herbivore populations, and subsequent reproductive failure and local extinction of some plants, birds, herptiles, and rodents (Crooks and Soule 1999; Terborgh et al., 2001). Currently published research on carnivores in mixed and severe wildfires is limited to primarily forested habitats. Many mesopredators (i.e., medium-sized carnivores), such as martens, fishers, skunks, and raccoons, are associated with forest habitats. Some are forest generalists, whereas others are forest specialist, riparian associates, or

semiaquatic species. Many of these species are known to occur on the project site and the broader project area and in adjacent forest lands.

Collision Risks. Insects, birds, and bats are all at risk from collision with the WTGs, guy wires, or met towers. Operational impacts to birds and bats are evaluated below.

Insects that occur in the air column within the rotor swept area will be subject to injury or mortality during operations. Insects can be attracted to the warning lights placed on the tops of the WTGs, the placement of the turbines, the color of the blades and likely other unknown factors. Windfarms have been demonstrated to be a source of mortality for many species of insects, but the larger ecological affects are not well understood. Insects collide with wind turbines in densities that can affect the drag of the blades. The contaminant layer of insect detritus on blades is an undisputable record of insect fatalities, yet the true number of insects killed at wind turbines may be even higher, because insects may be propelled away after impingement without leaving organic matter on blades (Voight 2021). Rydell et al (2010) noted that many bats killed at windfarms in Europe may have been foraging on high flying insects. Voigt (2021) also found that a single turbine located in the temperate zone in Germany might kill about 40 million insects per year. The study also suggested there is uncertainty if certain insect species are more vulnerable than others, and if certain insects are attracted to wind turbines.

It is likely that the operation of the project will result in mortality to common and potentially special status insects that fly through the turbine fields. The turbine height of over 500-feet is well within the migration altitude for may insects (Thess and Lengsfeld 2022) and it is well documented that WTGs pose a collision risk for a variety of insects. While it is unknown what the larger ecological effects to aerial insects could be in the Fountain Wind project area it is likely the facility will result in a localized ecological sink to some species and could have long term ecological consequences.

O&M activities associated with the project are expected to result in direct and indirect impacts to common wildlife during the life of the project. Generally, these would be expected to be lower and less severe compared to initial construction activities except for species that collide with WTGs. These impacts would be limited to the immediate project site and surrounding area depending on the species and the type of O&M activity being conducted.

Operational impacts to common wildlife could be more widespread should a wildfire start on the project site or in the immediate area. As noted previously, information in the record indicated the height and layout of the WTGs provide an obstruction that could hinder firefighting in the WTG field. Should a fire start or aerial firefighting attempts be hindered it could spread and affect wildlife in non-project areas including the SNF and LNF. These impacts could be severe but would vary on the fire severity and frequency. While adverse staff considers these impacts to be less than significant under CEQA for common wildlife. However, there are several existing COCs that would

reduce impacts to common wildlife and the Applicant has proposed a series of shaded and non-shaded fuel breaks to reduce the spread of fires on the project site (FWPA, TN 254350). **HAZ-6** (Fire Prevention Plan), **HAZ-7** (Fuel Breaks Management Plan), and **HAZ-8** (Site Water Supply Plan) would require the management of vegetation, implementation of fire protection and suppression methods, and developing a plan to determine the volume, number, and location of water tanks to support fire suppression on the project site. In addition, staff recommends the implementation of **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-15** (Special-Status Plant Avoidance Measures), **FOREST-1, FOREST-2, AQ-SC3**, **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7**, and **WORKER SAFETY-1**. Staff concludes while not required the implementation of these COCs would reduce project related impacts to common wildlife.

Special Status Wildlife

Habitat in the project area has the potential to support a variety of federal and state listed, candidate for listing, proposed for listing, state fully protected wildlife species, and species of special concern.

Impacts to special-status wildlife would vary depending on the habitats utilized by these species and the types of work activities conducted at occupied locations. These could include injury or mortality of individuals, loss or degradation of habitat, impediments to movement, disturbance to breeding and foraging behavior, and exposure to herbicides or other hazardous materials. Indirect impacts could include the degradation of habitat from invasive and noxious weeds. Wildlife species that prefer densely forested habitats would be more adversely affected than those that favor open habitats or riparian areas. Open and riparian areas would be subject to the same level of vegetation removal compared to areas supporting timber lands.

Special Status Invertebrates

Threatened, endangered, candidate, proposed for listing, or other special status invertebrates were not observed in the project area during the biological surveys conducted by the Applicant. However, many of these species are highly cryptic or have life histories that limit their detection.

Federally endangered fairy shrimp are not expected to occur as the Applicant did not locate any vernal pool complexes on the project site. Shasta crayfish (Pacifastacus fortis) a federally endangered species, is not known from the project area and appears to be limited to drainages associated within the Fall River and Hat Creek subdrainages of the Pit River (FWPA, TN 248288-6). Based on habitat conditions Western Bumble

Bee, Crotch's Bumble Bee, and Monarch Butterfly, have a potential to occur in in the project area.

Western Bumble Bee and Crotch's Bumble Bee.

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Crotch's bumble bee is known from Shasta County and has the potential to occur in portions of the project site that support suitable foraging resources such as meadows, grasslands, and chaparral communities. They are expected to have a more limited potential to occur in densely forested woodlands. Construction of the project could provide some beneficial impacts to bumble bees by the creation of shaded fuel breaks and other managed areas that would be required to plant annual wildflowers and other floral resources. With the implementation of staffs recommended COC impacts to these species would be reduced to less than significant levels and staff considers the mitigation would meet the fully mitigate standard under CESA.

Background and Analysis. Crotch bumble bee is a candidate for listing under the California Endangered Species Act (CESA). The western bumble bee is a USFS sensitive species and state candidate endangered (CDFW, 2024b). Western bumblebee is known from Shasta County (Xerces Society, 2024b). Nine CNDDB records of western bumble bees occur within 5 miles of the project area (CDFW, 2024e). Similarly, little is known about specific habitat requirements of the species as they can be found in a variety of vegetation communities including grassland, scrub, chaparral, and woodlands that provide native foraging resources. Crotch bumble bees prefer smaller flowers that are abundant with pollen and nectar, such as milkweed (*Asclepias* spp.), chaenactis (*Chaenactis* spp.), deerweed (*Acmispon* sp.), buckwheat, lupines (*Lupinus* spp.), clovers (*Medicago* spp.), phacelias, and sages (*Salvia* spp.) (Williams et al., 2014).

The project area is located at the northern margin of the current range of Crotch's Bumble bees. As more robust data is currently being collected across the state of California through programs like the Bumble Bee Atlas, the distribution of western and Crotch's bumble bee throughout its range will be better understood (Bumble Bee Atlas, 2024). For example, a review of recent iNaturalist records have demonstrated that this species is perhaps more broadly distributed than once thought. Recent records have been made as far south as Indio California and east of Barstow California (iNaturalist, 2024). As such, there is a moderate potential for western and Crotch's bumble bee to occur in low numbers throughout the project site and broader project area in areas that support annual wildflowers and other forage plants. They would not be expected to forage in dense conifer woodlands but could nest or overwinter in these locations.

Direct impacts to western and Crotch's bumble bee, if present, could include the loss or modification of foraging and nesting habitat, the disturbance or destruction of occupied nesting sites, and exposure of individuals and/or nesting sites to fugitive dust, ground

vibration, herbicides, and other hazardous materials. Bees could collide with vehicles on public roads particularly on Highway 299 during the delivery of project components. Indirect impacts to western bumble bee could include habitat fragmentation and the loss or degradation of habitat from invasive weeds.

Habitat Loss, Habitat Fragmentation, and Nest Loss. Western bumble bees require suitable nesting sites for their colonies, adequate nectar, and pollen resources available throughout the duration of the colony period (spring, summer, and fall), and suitable overwintering sites for the queens (Jepson et al., 2014). Nesting sites are usually found in underground cavities, small mammal burrows, and logs in a range of habitats, including mixed woodlands, montane meadows, grasslands, farmlands, and urban areas (COSEWIC, 2014). However, overwintering habitat for Western bumble bees is poorly understood.

Crotch bumble bees exhibit social behavior, creating colonies of related individuals that cooperate to maintain the health and survival of the colony. Colonies consist of a caste system which includes queens, workers, and reproductive males. New queens emerge during colony establishment, growing season, or reproductive stage. These life stages are defined as the Colony Active Period by CDFW. During each life stage, the colony exhibits different behaviors, including nesting, foraging, and overwintering. The height of the Colony Active Period for Crotch's bumble bee occurs between February and October; however, the timing of a singular nest can be dependent on climate conditions. For example, a nest at lower elevation with an earlier blooming period will likely be active before a nest with later blooming floral resources at higher elevation (Williams et al., 2014). Late season snow is common on the Fountain Wind project site and cooler temperatures are expected to result in a delayed emergence or lower use compared to lower elevation sites. However, late season foraging could be important for bees that are found along the margins of the snow line.

Relatively open habitats with adequate foraging resources and nesting site substrates occur in limited quantities in the project area and this loss is not expected to contribute to a substantial loss of habitat for this species. Most of the site consists of managed timber lands however there are a few small meadows, annual grasslands, and disturbed road edges that provide limited floral resources for these species.

The removal of conifer and mixed forest, woodland, and chaparral habitats and a transition of these areas to low-growing vegetation communities surrounding the WTG's and for shaded fuel breaks could result in a net increase in suitable foraging and nesting habitat for western and Crotch's bumble bee. Habitat fragmentation can adversely a wide range of species. Bumble bee species richness, abundance, and genetic diversity are influenced by the quality of habitat on a landscape level. While bumble bees can forage and disperse over relatively long distances, isolated patches of habitat may not be sufficient to support bumble bee populations (Hatfield and LeBuhn, 2007; Ockinger and Smith, 2007). Because of their unique method of sex determination and colonial life cycle, bumble bees are particularly sensitive to habitat fragmentation

(Xerxes Society et al., 2018). The project area is composed of managed timber lands which may represent movement opportunities for bees that forage along the open patchwork of clear cuts that occur in the region. In addition, most project activities would occur within densely forested areas that provide limited habitat to western bumble bee. The permanent conversion of these areas to low-growing vegetation communities would or developed WTG turbine pads could establish habitat more suitable for the species which would not result in the establishment of new barriers to bumble bee movement or fragment habitat during construction.

In addition, the use of a native seed mix that includes foraging species could benefit bees and other pollinators on the project site and could ultimately result in beneficial impacts by expanding foraging habitat and creating corridors for dispersal. Annual wildflowers located along the existing PG&E line could already provide pathways for dispersal for this species.

Although not required for habitat loss **BIO-5** (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-11** (Conduct Biological Monitoring During Construction) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the Project. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. The condition includes limiting work to daylight hours, inspecting pipes and excavations, conducting pre-construction surveys, monitoring and many other protective measures. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention.

The most likely impact to these species would be the destruction of nest sites should they occur within suitable habitat for either of these bees. Colonies could be lost or collapse from ground vibration or be crushed by vehicles and other heavy equipment. In addition, dust could result in a reduction of floral resources or disturbance to an active bumble bee colony if present. Research on the ecological effects of dust has mostly focused on its consequences for ecosystem processes from local to global scales (Field et al., 2009). Much less is known about effects at the level of individual organisms. For example, the effects of dust on plant reproduction are not entirely known, although there is ample reason to believe that it is harmful (Waser et al., 2017). It has been demonstrated that dust can interfere with pollen-stigma interaction and fruit set resulting in reductions in pollen viability and stigma quality (Zhang et al., 2019). Fugitive dust would be generated during construction which result in degradation of flowering plants in adjacent habitats.

To reduce impacts the Applicant would implement **BIO-13** (Western and Crotch's Bumble Bee Avoidance Measures), which would require identifying suitable habitat for western and Crotch bumble bees within the project area, surveying those areas for active nesting sites, and avoiding active nesting sites, if present. Work would be directed around the active nest site until the bees have left the colony or the colony has become dormant. If more than two active or dormant colonies must be disturbed a qualified biologist will make an attempt to excavate the colony and relocate the queen and any other dormant bees to an alternative cavity or artificial structure.

As a component of **BIO-8** (Restoration and Management of Temporarily Disturbed Areas and Shaded Fuel Breaks) the Applicant would be required to include preferred foraging species as part of the seed mix along with other flowering plants used by pollinators. This would ensure that temporarily disturbed areas that are proposed for restoration would provide future habitat and offset any direct loss of individual bees during construction. In addition, **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-1** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-2** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. Impacts from fugitive dust would be mitigated by implementation of **AQ-SC3,** which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits.

Exposure to Herbicides and Hazardous Materials. Exposure to herbicides or other hazardous materials could result in the degradation of foraging habitat or the loss of individual bees or active nesting colonies. Bumble bees require consistent sources of nectar, pollen, and nesting material when adults are active, typically from mid-February to late September in temperate areas. For the project, weather conditions may delay foraging opportunities as the site is well within the snowbelt. Kearns et al. (1998) state "herbicide use affects pollinators by reducing the availability of nectar plants. In some circumstances, herbicides appear to have a greater effect than insecticides on wild bee populations. Some of these bee populations show massive declines due to the lack of suitable nesting sites and alternative food plants."

Western bumble bees are generalists and forage over a wide variety of habitats if floral resources are available. Therefore, impacts associated with improper herbicide application, or unintended release of herbicides or other hazardous materials that

results in the indiscriminate reduction of a small number of floral resources would be negligible relative to the abundance of region-wide resources available to western bumble bee. In addition, additional foraging habitat may develop over time as areas around the WTGs and shaded fuel breaks transitions to low shrubs, annuals flowers, and grasses. Staff has proposed COCs to focus herbicide usage on target species and avoid overspray or direct application on flowering plants.

The introduction or spread of non-native weeds also pose a risk to this species. Like all North American bumble bees, western and Crotch's bumble bees prefer open, meadow-like conditions and depend on floral resources for their nutritional needs. Crotch's bumble bees appear to tolerate more scrub communities as long as there are floral resources. When invasive weeds invade and dominate formerly native habitats, they may threaten bumble bee populations by competing with the native nectar and pollen floral resources relied upon by bumble bees. If pervasive enough, weed infestation can result in the complete displacement of native vegetation and fragmentation of suitable habitat, even for generalist foragers. Extensive proliferation of invasive weeds on a broader scale can also result in an increased risk of wildfire. Although weeds are common across much of the region and are known to occur along access roads and within the project area, the loss or degradation of bumble bee foraging habitat could occur unless weed control measures are implemented.

BIO-9 would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring.

Direct and indirect impacts that degrade habitat or result in the loss of western or Crotch's bumble bee would be considered a significant impact under CEQA. Because of this species status as a State candidate for listing any project related impacts would also require compliance with CESA standards. These requirements include measures to fully off-set impacts to the species.

To reduce impacts the Applicant would implement **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-13** (Western and Crotch's Bumble Bee Avoidance Measures), **AQ-SC3**, **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7**, and **WORKER SAFETY-1**. The implementation of these COCs would reduce project related

impacts to western and Crotch's bumble bee to less-than-significant and fully mitigate impacts to the species should take occur.

Operation

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to western and Crotch's bumble bees if present. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire or potential collisions with the WTGs. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to noise, fugitive dust, and exposure to herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. Following vegetation treatment and removal, herbicides would be selectively applied to suppress tree regrowth and control noxious weeds and invasive species. Approved herbicides would be selectively applied by licensed applicators.

Depending on how the Applicant manages the shaded and non-shaded fuel breaks vegetation could be removed with heavy machinery. Clearing vegetation could impact foraging bees or damage colonies should they occur. To mitigate impacts from the construction phase of the project, Staff recommended **BIO-8** (Habitat Restoration and Vegetation Management Plan) which included reseeding temporary disturbed areas and areas designated as fuel breaks with a pollinator friendly seed mix. Similarly, **HAZ-7** (Prepare a Fuel Breaks Plan) would provide guidance when working and managing vegetation in these areas.

Several studies have indicated that managed areas around windmills and other facilities can benefit a variety of insects by providing important foraging opportunities compared to adjacent scrub vegetation. In study by Pustkowiak et al (2017), they found that non-cropped area around windmills can be valuable habitats for wild plants and pollinating insects such as bees, butterflies, and flies. Pollinator diversity index and species richness at windmills increased with the distance to the nearest grassland patch and windmill. The population sizes of pollinating insects were also positively associated with plant diversity. They concluded that while the development of wind farms has various negative environmental consequences, they can be alleviated by the increase of the local population size and diversity of wild plants and pollinating insects at windmills (Ibid).

Similarly, bumble bees may use elongated linear features such as rivers, forest edges, and roads to as navigational tools (Brebner et al 2021). By creating additional foraging habitat for western and Crotch's bumble bee it is possible these species could increase use of the project site. Staff considers this a beneficial impact and would not hold the Applicant accountable for the incidental loss of western or Crotch's bumble bees when conducting an otherwise lawful activity such as fuels management consistent with the guidelines identified in their management plans. However, as part of those plants staff recommends that vegetation management be timed to avoid the peak of the flowering and flight season, when possible, apply herbicides on target vegetation consistent with **BIO-9** (Integrated Weed Management Plan), **BIO-7** (General Impact and Avoidance Measures), conduct monitoring **BIO-11** (Conduct Biological Monitoring During Construction), and follow the prescriptive requirements of **BIO-13** (Western and Crotch's Bumble Bee Avoidance Measures).

Collision with WTGs and Other Equipment. Currently there is limited data on the flight elevations for most species of bumble bees. Hypothetical studies demonstrated that some bees could fly at extreme elevations under certain conditions. Dillon and Dudley et al (2014) found that for bumble bees in China, they can fly at elevations higher than Mt Everest under lab conditions although they cannot survive the freezing temperatures at those elevations. All the bees used in the experiment could fly in conditions equivalent to 13,000 feet (4,000 m), and some even made it past 30,000 feet (9,000 m) — the height of the peak of Mount Everest. The study suggested that while most bumble bees typically fly at lower elevations it is possible for bees to reach higher elevations if thermal requirements are maintained.

Staff has been unable to find specific evidence if western or Crotch's bumble bees would occur within the rotor swept area of the WTGs. Therefore, it is uncertain if western or Crotch's bumble bees would be at risk of collision with the WTGs, guy wires, or met towers. Many species of bumble bees can fly at high elevations above the ground however most studies suggest they are more closely associated with a 1-3 meters area above foraging plants (Osborne et al 1999). However, there is ample data that other bees and numerous insects are killed from collisions with WTGs. For example, Voigt (2021) found that a single turbine located in the temperate zone in Germany might kill about 40 million insects per year. The study also suggested there is uncertainty if certain insect species are more vulnerable than others, and if certain insects are attracted to wind turbines. Nonetheless, it is likely that the operation of the project will result in mortality to insects that fly through the turbine fields. However, it is unknown if bumble bees will collide with the WTGs as their flight paths are more closely associated with low elevation foraging.

If Crotch's or western bumble bees are detected in the project area during the completion of protocol surveys, the Applicant would be required to implement **BIO-14** (Insect Mortality Monitoring Plan) which will be required for birds and bats, requires the development and implementation of a mortality sampling plan for special status invertebrates. This would require developing and implementing a scientifically rigorous

sampling program to determine the types of insects subject to mortality from the operation of the WTG's. If any mortality to western or Crotch's bumble bees is detected the Applicant would be required to contact the CEC and CDFW to implement supplemental mitigation measures. Implementation of this measure would reduce impacts to less than significant and provide a mechanism to meet CESA requirements. Staff considers the threshold for take to be one Crotch's or one western bumble bee.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for vegetation and landforms and common wildlife. Fires could be initiated during vegetation management or O&M activities from vehicle use, improper use of equipment, or from smoking in vegetated areas. Fires could also be initiated from malfunctions with the WTGs or if lightning strikes the turbines or met towers. The key concern for staff is how the location and design of the project hinders aerial firefighting on the project site and in the surrounding area.

Construction of the proposed Project would include a network of large shaded and non-shaded fuel breaks which could attract western and Crotch's bumble bees. These areas would be managed and seeded with annual and perennial pollinator species as a component of staffs recommended COCs including **BIO-8** (Habitat Restoration and Vegetation Management Plan) which included reseeding temporary disturbed areas and areas designated as fuel breaks with a pollinator friendly seed mix and **HAZ-7** (Prepare a Fuel Breaks Plan) would provide guidance when working and managing vegetation in these areas. This could increase habitat for the species in the region and could increase the potential for these and other inspects to occur. This mitigation would result in beneficial impacts to these species, and staff acknowledges that unforeseen impacts from wildfire could occur.

Direct and indirect impacts to western or Crotch's bumble bees can range from beneficial to adverse depending on the intensity, scale, and frequency of the event. Bees can likely avoid small fires but may be consumed in larger stand replacing fires. During high winds bees may either remain in the nests, shelter in vegetation, or be carried along with the wind. Smoke and ash from fires can affect the ability of the bee to breathe and may affect other functions. Smoke and ash are also known to change how a bee utilizes polarized light to navigate (Melathopoulos et al., 2020). Depending on where the bees occur, they could be consumed by the fire. Bees that remain in the nests during the fire may persist. A global study of bees found that most bees are found in nests 4-inches in depth or greater which provides thermal protection from some wildfires (Cane and Neff, 2011). However, bees that are nesting in downed wood or other flammable materials could be lost. Bumble bees that live in colonies like western or Crotch's bumble bees usually nest at or just below ground level and would be located in the most hazardous zone (Xerces Society 2020). However, staff has personally observed Crotch's bumble bee using a small mammal burrow which would provide better thermal protection that leaf litter alone. The greatest concern is if a queen is killed, there will be no nest from that individual next year (Ibid).

The most likely areas to find bumble bees will be in the shaded and non-shaded fuel breaks which would support lighter and flashier fuels which could further mitigate risk to the species. The most intense fires are likely to occur in conifer woodlands where these species are less likely to occur. This would also be the case in offsite areas should a fire spread from the project area to adjacent lands.

Post fire conditions could benefit bees and other pollinator species as annual plants often dominate post burn areas. Following the massive Douglas Fire Complex that burned in southern Oregon in 2013, wildfires and other forage plants were abundant across the burn area. The Oregon State University Forest Animal Ecology Lab conducted surveys of the burned area 4-5 years later and found that bee species richness (i.e., the number of species) and abundance of bees was high (Melathopoulos et al., 2020). Staff recognizes that additional studies need to be completed in order to better understand the larger effects of landscape level wildfires on bumble bees.

For the purposes of this analysis staff concludes that because bees have some mechanisms to avoid some fires, may be active when wildfires occur, and are likely found in areas supporting lighter fuels such as fuel breaks, meadows, grasslands, and scrub communities, staff considers O&M impacts from wildfires to be less than significant with the implementation of **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) **BIO-13** (Western and Crotch's Bumble Bee Avoidance Measures), **AQ-SC3**, **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7** (Prepare a Fuel Breaks Plan), and **WORKER SAFETY-1**. The implementation of these COCs would reduce impacts to western and Crotch's bumble bee to less-than-significant and fully mitigate impacts to the species should take occur.

Monarch Butterfly

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Monarch butterflies are known from the region, but the project site lacks suitable overwintering habitat. Butterflies may be encountered during construction or as larval animals should they occur on host plants which occur on the Project Site. Impacts would be reduced and or minimized by the implementation of staff's proposed COCs. In addition, the creation of shaded fuel breaks could increase foraging habitat for this species, but it may be outweighed by the risk of collisions with the WTGs (described under operational impacts below). Although this species is only protected at their overwintering sites staff is concerned that large numbers of this species could be at risk of collision.

Background and Analysis. Monarch butterfly is a candidate for federal listing. Although, species designated as federal candidates for listing do not receive full protection under the ESA, take would only be authorized under the context of the appropriate permits issued by USFWS if the species is officially designated as federally threatened or endangered prior to implementation of the project. The abundance and migratory behavior of monarch butterflies are a product of the diversity and abundance of larval milkweed host plants of the genus Asclepias (Malcolm, 2018). During the breeding season, monarch butterflies lay their eggs on their obligate milkweed host plant which provide toxins to protect them from predation. Larvae emerge after two to five days and develop while feeding on the milkweed host plant. Individual monarch butterflies in northern California undergo long-distance migration between spring and summer breeding grounds and overwintering sites located primarily along the central coast in California. Surviving adults' mate at overwintering sites in the spring before dispersing back to breeding grounds.

The project area is outside of the overwintering range for monarch butterfly; however, there are numerous observations of migratory individuals documented in Lassen County (iNaturalist, 2024). Additionally, the project area supports milkweed larval host plants and roosting habitat. There is a moderate potential for direct impacts to monarch butterfly, if present during Construction activities, which could include loss of suitable roosting habitat, mortality to larvae from vegetation removal, exposure to fugitive dust or herbicides, and other hazardous materials. Indirect impacts could include habitat fragmentation and the loss or degradation of habitat from invasive weeds.

Monarch butterflies are diurnal migrants, meaning they migrate during the day. At night, migratory individuals roost on trees or shrubs and often form large groups of butterflies. Monarch butterflies in the northern part of their range roost primarily in conifers and maple trees, often near bodies of water. Vegetation removal associated with the project would primarily occur in forested habitat within proximity to a variety of perennial and intermittent streams, meadows and ponds which support potentially suitable roosting habitat for monarch butterfly. However, the site is located at relatively high elevations within the snow belt and the loss of potential roosting habitat along a patchwork of existing cut blocks (i.e., timber harvest areas) would represent a negligible fraction relative to similar habitat throughout the species' spring and summer range and potentially suitable roosting habitat along the interface between intact forested areas would remain available. It is unlikely that this species would be affected due to habitat fragmentation. If present this species could still roost along the existing transmission line corridor and along the margins of cleared areas. Furthermore, transmission line ROWs have been identified as posing an expansive opportunity for monarch butterfly conservation, and, if properly managed can provide high-quality foraging habitat for the species (Cardno, Inc., 2020). If seeded with suitable host plants as a component of restoration activities portions of the project area including the shaded fuel breaks could provide additional foraging habitat for this species.

Several species of the genus Asclepias, including heart leaf milkweed (Asclepias cordifolia) and showy milkweed (A. speciosa) used as a larval host plant, were observed during the rare plant surveys conducted by the Applicant (FWPA, TN 248308-1). Therefore, it is possible that monarch butterflies use these locations to some degree.

Clearing timber stands and managing vegetation around the WTGs and shaded fuel breaks would promote low-growing, native vegetation communities which would ultimately provide suitable habitat for milkweed recruitment and growth. However, some milkweed plants would likely be inadvertently removed during the initial clearance activities. If present during project activities, impacts to monarch butterfly due to mortality from the disturbance or removal of occupied milkweed host plants, exposure to herbicides or other hazardous materials, exposure to fugitive dust, and degradation of habitat from invasive or noxious weeds would be considered a significant impact under CEQA.

To reduce impacts, the Applicant would implement **BIO-15** (Avoidance of Milkweed Plants), which require retaining milkweed plants during vegetation removal to the maximum extent feasible. In addition, **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) and **BIO-11** (Conduct Biological Monitoring During Construction) would be required. As a component of **BIO-8** (Restoration and Management of Temporarily Disturbed Areas and Shaded Fuel Breaks) the Applicant would be required to include suitable milkweed species as part of the seed mix along with other flowering plants used by pollinators such as bumble bees. This would ensure that temporarily disturbed areas that are proposed for restoration would offer host plants for this species. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. **BIO-9** (Integrated Weed Management Plan) would require the identification and avoidance of milkweed plants during vegetation management or herbicide use.

Impacts from fugitive dust would be mitigated by implementation of **AQ-SC3**, which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits. Implementation of these measures would reduce impacts to a less than significant level.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to monarch butterflies. Most impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except for collisions with the WTGs. There is ample data to demonstrate that insects are killed from collisions with WTGs (Voigt 2021). Monarch butterflies may be vulnerable to collisions with the WTGs because they migrate at high altitudes and are known from the project region. The project is located along a known broad migratory pathway for this species. It is likely that this species would be subject to routine seasonal mortality for the life of the project. Implementation of staffs recommended COC's would reduce impacts for monarch butterflies associated with typical maintenance activities but would not prevent collisions with the WTGs. COCs that require long term monitoring may identify offending WTGs that pose a particular risk, and these WTGs may be subject to seasonal curtailment. Seasonal curtailment may also be a mechanism to reduce mortality to large aggregations of monarchs should they be detected in the project area.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to noise, fugitive dust, and exposure to herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. Following vegetation treatment and removal, herbicides would be selectively applied to suppress tree regrowth and control noxious weeds and invasive species. Approved herbicides would be selectively applied by licensed applicators.

Depending on how the Applicant manages the shaded and non-shaded fuel breaks vegetation could be removed with heavy machinery. Clearing vegetation could impact butterflies or larval host plants supporting developing monarch butterflies. To mitigate impacts from the construction phase of the proposed project, Staff recommended **BIO-8** (Habitat Restoration and Vegetation Management Plan) which included reseeding temporary disturbed areas and areas designated as fuel breaks with a pollinator friendly seed mix. Similarly, **HAZ-7** (Prepare a Fuel Breaks Plan) would provide guidance when working and managing vegetation in these areas.

As described for bumble bees, several studies have indicated that managed areas around windmills and other facilities can benefit a variety of insects by providing important foraging opportunities compared to adjacent scrub vegetation (Pustkowiak et al., 2018). This could ultimately benefit monarch butterflies as milk weed would be included in the seed mix. In addition, because milk weed is already found on site it may proliferate to recently disturbed areas and weed management required by **BIO-9** (Integrated Weed Management Plan) would require the identification and avoidance of milkweed plants during vegetation management or herbicide use.

By creating additional foraging habitat for monarch butterflies, it is possible these species could increase use of the project site. Staff considers this a beneficial impact and would not hold the Applicant accountable for the incidental loss of butterfly larvae when conducting an otherwise lawful activity such as fuels management consistent with the guidelines identified in their management plans. COCs require that vegetation management be timed to avoid the peak of the flowering and flight season, when possible, apply herbicides on target vegetation consistent with **BIO-9** (Integrated Weed Management Plan) and conduct monitoring **BIO-11** (Conduct Biological Monitoring During Construction) during specific maintenance activities such as herbicide application and vegetation removal.

Collision with WTGs and Other Equipment. Monarch butterflies are diurnal migrants, meaning they migrate during the day. At night, migratory individuals roost on trees or shrubs and often form large groups of butterflies. In spring, monarch butterflies leave hibernation grounds in Florida, central Mexico and the coast of southern California and travel north, making use of strong winds that help it to overcome large distances in a relatively short time (Thess and Lengsfeld 2022). These pathways include portions of northern California which may put migrating butterflies at risk. The proposed turbine sweep area and height of over 600-feet is well within the migration altitude for may insects (*Ibid*) and it is well documented that WTGs pose a collision risk for a variety of insects.

As described for bumble bees and other aerial insects there is ample data to demonstrate that insects are killed from collisions with WTGs (Voigt, 2021). Monarch butterflies in particular, may be vulnerable to collisions with the WTGs because they migrate at high altitudes. While it is possible that butterflies would fly at elevations above the turbine height it is equally possible that they would fly at elevations where they are at risk of collision. Weschler and Tronstad (2024) conducted an extensive literature search of insect interactions with wind turbines and found that insect collisions are a well-known phenomenon and that wind developers have been evaluating ways to minimize the drag that insect carcasses have on WTGs. In addition, as noted by Voight (2021) tens of millions of insects can be lost at a single turbine site. While the exact size and wind regime of those turbines are not known, staff concludes that monarch butterflies would be subject to mortality. In addition, because they migrate in groups following the various air currents it is likely that large numbers of the species would be killed should they fly through the WTG field. Staff concludes that these impacts would be significant and Unavoidable. It might be possible to reduce impacts during peak migration periods through curtailment of offending turbines through implementation of **BIO-14** (Insect Mortality Monitoring Plan) which requires the development and implementation of a mortality sampling plan for special status invertebrates, birds, and bats. This would require developing and implementing a scientifically rigorous sampling program to determine the types of insects are subject to mortality from the operation of the WTG's. If any mortality to monarch butterflies is detected the Applicant would be required to contact the CEC to implement supplemental mitigation measures.

While the monarch butterfly itself is not protected under the ESA, its habitat may be protected under various federal, state, and local regulations. For example, specific overwintering sites or breeding habitats may fall under protection if they are located within designated conservation areas or are managed by agencies with conservation mandates.

Although there are several options that may reduce collision risk such as seasonal curtailment during the peak migration period and or curtailment of offending turbines (i.e., turbines where mortality rates are noted to be especially high compared to other turbines), there is still much to learn about how and why insects may be attracted to turbines. Some studies have suggested that heat or light may attract some species. However, staff is uncertain if there are specific cues that attract butterflies, or their mortality is an artifact of the physical placement of the WTG in the air column. To determine if seasonal curtailment is appropriate the Applicant would be required to implement **BIO-14** (Insect Mortality Monitoring Plan) which requires the development and implementation of a mortality sampling plan for special status invertebrates including monarch and other butterflies, birds, and bats. This would require developing and implementing a scientifically rigorous sampling program to determine if monarch butterflies are at risk and if they occur at specific turbine locations. Implementation of this measure would not reduce initial impacts to less than significant levels, but it would provide a mechanism to determine if impacts could be reduced through seasonal or even short-term curtailment or off-site habitat preservation or establishment.

Risk of Wildfires During O&M. The risk of wildfires during O&M to monarch butterflies would be similar to impacts described for vegetation and landforms, invertebrates, and western or Crotch's bumble bees. The primary risk to this species would be if larval butterflies were present on host plants when a wildfire occurred or if a fire occurred at night when migrating butterflies were sheltering on vegetation. Fires that occur during daylight hours would not likely adversely affect this species provided they could flee the smoke and ash columns.

Construction of the project would include the development of a network of large shaded and non-shaded fuel breaks. These areas would be managed and seeded with annual and perennial pollinator species including larval host plants for monarchs as a component of staffs recommended COCs including **BIO-8** (Habitat Restoration and Vegetation Management Plan). **HAZ-7** (Prepare a Fuel Breaks Plan) would also provide guidance when working and managing vegetation in these areas. Introducing additional larval host plants could increase the potential for monarch butterflies to place eggs with the project area. This mitigation would result in beneficial impacts to this species, and staff acknowledges that unforeseen impacts from wildfire could occur.

Although some larval butterflies may be lost during a wildfire, it is likely that post fire conditions would benefit this species as early successional species including different species of milk weed colonize burn areas.

For the purposes of this analysis staff concludes that because monarch butterflies use the area periodically, have some mechanisms to avoid fires, would likely be active when wildfires occur, and are likely found in areas supporting lighter fuels such as fuel breaks, meadows, grasslands, and scrub communities, staff considers O&M impacts from wildfires to be less than significant with the implementation of **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-14** (Insect Mortality Monitoring Plan), **BIO-8** (Avoidance of Milkweed Plants), **AQ-SC3**, **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7** (Prepare a Fuel Breaks Plan), and **WORKER SAFETY-1**. The implementation of these COCs would reduce impacts to monarch butterflies to less-than-significant.

Wawona riffle beetle, Western Pearlshell, Oregon Shoulderband Snail, Church's or Klamath Sideband, Topaz Juga, Kneecap Lanx, Sierra Blue Butterfly, and Other Special Status Invertebrates

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. There are several special status or protected invertebrates that have the potential to occur in the project area. On the site these would be more restricted to micro habitats including downed logs, dense leaf litter, and for aquatic species, within the riparian corridors. Most of these species are extremely cryptic and some would be subject to mortality or disturbance during the construction of the project. Impacts would be reduced and or minimized by the implementation of Staffs proposed COC's.

Background and Analysis. There are several special status invertebrate species that have the potential to occur in microhabitats across the project site. Some of these include Oregon Shoulderband Snail (S1S2), Church's or Klamath Sideband (S3), topaz Juga (S2), kneecap Lanx (S2), and Sierra blue butterfly (S2). None of these species were detected during surveys by the Applicant but it is uncertain if specific searches for these species were conducted. Other species such as Nugget pebblesnail (*Fluminicola seminalis*)-S2 and Western ridged mussel (*Gonidea angulate*)-S1 may also occur.

Most species of gastropod are cryptic, occur in micro-habitat types, and are not easily detected during routine surveys. Typically, the species are found during specific weather conditions (i.e., rain or misting events) or in specific locations (i.e., under leaf litter, in scree, under logs and bark, at the margins of streams, etc.). For example, juga snails are found in perennial seeps, springs and spring runs, groundwater-influenced creeks and streams, and rivers. Oregon shoulderband snails also have unique

microhabitat niches and are often found in talus slopes, downed woody debris where these is high soil moisture like other shoulderband snails.

Stream associated species are also difficult to detect unless focused surveys of microhabitat areas are searched. Kneecap lanx are small freshwaters limpets that are found in freshwater habitats. Western pearlshell are freshwater mussels that are also found in freshwater riparian habitats where they filter organisms from the water column. Because this species uses salmonids as a host species, they are unlikely to be present in the upper headwaters found at the project site.

Sierra blue butterfly is found in subalpine meadows where the larvae feed on Sierra shooting star (*Dodecatheon jeffreyi*). There are several iNaturalist observations of this species in the region and this species may fly through the project area. However, the larval host plant for this species was not detected during several botanical surveys (FWPA, TN 253167) conducted by the applicant or during the jurisdictional delineation which would have targeted meadow habitat during the field work (FWPA, TN 248307-2). Meadow habitat in the project area is limited and the absence of larval host plants may limit use of the project area by this species. Construction related impacts to this species are not expected to occur.

Direct impacts to non-listed, special-status gastropods and bivalves if present could include loss of suitable habitat and microhabitat, mortality from crushing and trampling, degradation of habitat from increased erosion and sedimentation, and exposure to fugitive dust, herbicides, and other hazardous materials. Wildfires could also be ignited during construction and pose a risk to these species. Indirect impacts could include the creation of barriers to dispersal from the creation or widening of roads, long-term alterations to hydrology, and degradation of habitat from the colonization of invasive weeds or animals.

Direct Mortality, Habitat Loss, and Habitat Fragmentation. Implementation of the project would remove conifer and mixed forest, woodlands, and chaparral habitat. In addition, riparian vegetation would also be removed to construct roadways and install stream crossings. However, most of the project area does not support permanently damp areas which most of the gastropod species prefer. It is likely that woodlands associated with north slopes, deep canyons, and more mesic portions of the project area near the wet meadows would support suitable habitat for gastropods. However, they can also persist in areas with thick duff or leaf litter such. These areas occur where timber was cut and left in place after the Fountain fire.

Bivalves are most likely to be found, if present, at the perennial stream crossings near that occur in the project area. Vegetation removal or ground disturbance within riparian areas, including seeps and springs where these species is most likely to be found could result in direct and indirect impacts.

Although the removal of habitat would be considered negligible on a range-wide scale, the loss of microhabitats, such as leaf litter and downed logs, that provide cover and

foraging resources, or the direct loss of these species would be considered a significant impact. Most of these species are cryptic and often limited to narrow habitat and may be overlooked during construction. To reduce impacts, the Applicant would implement **BIO-16** (Small Invertebrate Avoidance Measures) which would require the Applicant to conduct pre-construction surveys for these species in suitable micro habitat and relocate them from disturbance areas to suitable adjacent habitat prior to and during construction. As part of this measure suitable micro habitat locations would be identified prior to the initiation of construction. **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) and **BIO-11** (Conduct Biological Monitoring During Construction) would also be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the Project. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species if they occur in a shaded fuel break, replanting oaks and or other riparian vegetation that is temporarily disturbed and providing compensatory mitigation for permanent impacts to riparian or sensitive vegetation communities. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction.

The construction or new and wider access roads could also increase the distance these species may have to travel. However, as there is an existing network of roads and a patchwork of previously logged areas it is unlikely that these features would pose substantial barriers for these species.

Changes in Hydrology and Degradation of Water Quality. Ground disturbing activities such as the use of heavy equipment during vegetation removal, road construction, blasting, or the construction of culverts or other new water crossings, could result in offsite transport of sedimentation during rain events, particularly in microhabitat sites. This could result in a degradation of habitat quality through altering microhabitat structure and soil chemistry or smothering aquatic associated species such as bivalves. Excess dust could result in adverse physiological and behavioral effects or degrade microhabitats by reducing adequate foraging resources.

Impacts from exposure to fugitive dust would be reduced by **AQ-SC3**, which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized

limits. To reduce impacts from sediment or from changes to hydrology the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the SWRCB and would be required to implement a SWPPP. The SWPPP would ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1** and **WATER-2** would ensure compliance with SWPPP requirements. Specific measures related to working in aquatic habitats are described below under impacts to fish.

Introduction of Invasive Plants or Wildlife Species. In terms of ecological impacts, the introduction of invasive species is thought to be second only to habitat loss in contributing to declining native biodiversity throughout the United States (Brusati and Johnson, 2015). The accidental introduction or spread of non-native wildlife species into aquatic habitats can have adverse effects on native invertebrates and can lead to the loss of native invertebrates, fish, and other species. Personal vehicles, heavy equipment, pumps, tanks and pipelines, construction tools, and sample coolers are all capable of harboring invasive species and allow for their transport from an infested off-site location to the proposed project area. If heavy equipment has been operated in an area infested with New Zealand mudsnails, quagga mussel, or other invasive species, they can be introduced to new areas. Typically, equipment used in infested areas would be cleaned prior to use at a different site however mud or pooled water that remains on equipment can maintain the viability for invasive species while in transport to the project. Pumps, tanks, pipelines and fittings used for conveying construction water or for construction dewatering present the highest risk of spreading these species to aquatic areas.

New Zealand mudsnails, quagga mussels, and zebra mussels, which have been found in many lakes and river systems in California, can outcompete and reduce the number of native aquatic invertebrates that a watershed's aquatic fauna rely on for food. Although none of these species is known to occur in the project area, there is one record of New Zealand mudsnail near Whiskey Town in Shasta County (iNaturalist 2024). If imported into the site, their introduction could be devastating to local aquatic populations. The introduction of non-native plants could also result in adverse impacts to native invertebrates and result in habitat loss or changes in foraging resources.

The introduction and spread of invasive wildlife or weeds would be considered a significant impact under CEQA. To reduce these impacts Staff recommends which contain a series of standard protection measures and **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) which would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation. In addition, **BIO-10** (Invasive Species Management Plan) which would require the collection of baseline data

on invasive species, ensuring all vehicles and heavy equipment proposed for use on the project site will need to be cleaned (including wheels, tracks, undercarriages, and bumpers, as applicable) before delivery to the project site. In addition, biological monitors will inspect all equipment entering aquatic areas prior to entry to ensure that con-struc-tion activities do not introduce aquatic invasive species into the project site during construction. If mud or water is present on the equipment, the monitor will require the equipment to be cleaned and if needed treated. Collecting baseline data for the presence of non-native wildlife such as snails and other species will also protect the Applicant by documenting if these species are already present in the project area.

Exposure to herbicides and other hazardous materials. Sensitive invertebrates could also be harmed if they are exposed to herbicides or other hazardous materials due to improper use, accidental spills, or drift of herbicides or other hazardous materials. Hawkins et al. (1997) and Prezio et al. (1999) examined terrestrial gastropod species richness and density in regenerating spruce plantations before and 1 to 3 years after four different conifer release treatment. Despite marked changes in vegetation structure on the conifer release sites, no differences were evident in the species richness and density of gastropods following either chemical, mechanical, or manual treatments in the first year after treatment (Hawkins et al., 1997). However, during both the second and third year after the treatments, gastropod densities in untreated control areas were significantly greater (50 to 60 percent) than those in chemically treated areas (but still did not differ from mechanical or manual cutting treatment areas) (Prezio et al., 1999). Gastropod densities in nonchemical, cutting treatments started to recover more quickly than those in herbicide-treated sites (Prezio et al., 1999). Prezio et al. (1999) noted that observed density patterns may have been attributable to differences in litter deposition and near-ground microclimate between the treated and untreated sites. Although the exact treatment of vegetation on the project site has not been fully described it would likely contain a mixture of manual and chemical treatments. As described above under impacts to native vegetation the Applicant has proposed a series of measures to reduce impacts from improper herbicide use and to reduce the risk of accidently spills of chemicals or other materials. The Applicant has proposed a series of measures to reduce the risk of herbicide use, prevent and contain hazardous spills, and prevent and or fight wildfires. To reduce potential exposure to hazardous materials and limit sources of ignition during construction (discussed previously for vegetation communities) staff has incorporated these measures into proposed **COCs** including **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1** which includes spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to special status invertebrates. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire or for species that are at risk of collisions with the WTGs. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels for most operational impacts except for the risk of wildfires and for species that may collide with the WTGs such as Sierra blue butterfly.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to noise, fugitive dust, and herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. The modification of existing habitat would likely reduce the risk of encountering to special status invertebrates in many locations which would reduce risk of direct and indirect impacts for most species. However, some species using these areas would be subject to displacement or mortality depending on the specific O&M activity particularly if conducted in riparian areas. O&M activities could also result in the introduction of new invasive weeds or non-native snails or other invertebrates and could further spread invasive weeds that are already present in the project area.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-5** (Worker Environmental Awareness Program [WEAP]), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-16** (Small Invertebrate Avoidance Measures), **BIO-10** (Invasive Species Management Plan), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for common wildlife species and could increase during the O&M phase of the project. As previously described the turbines present obstructions and can impact aerial firefighting in the broader project area. In addition, although some terrestrial invertebrates are not adversely affected from the effects of fire, it can have a devastating impact on many other invertebrate species, not only killing them directly, but leading to long-term indirect effects such as stress, loss of habitat, territories, and food. The loss of key organisms in forest ecosystems, such as invertebrates, pollinators, and decomposers, can significantly slow the recovery rate of the forest (Boer, 1989).

Numerous studies have found negative responses of gastropods to fire. According to Burke et al. (1999), high-intensity fires are particularly damaging to gastropod populations as it destroys snails and their habitats. A five-year study examining the survival of mollusks in burned aspen groves following fires in Yellowstone National Park found fire to have a major impact on snail survival and abundance (Beetle, 1997). One severely burned site had only burned shells the first year following a fire and continued to support no live snails after 5 years. Two lightly burned sites with hospitable conditions (e.g., damp habitat, abundant litter, uncharred/charred rotten logs) maintained snail populations over the five-year period, but species richness did not increase over that time, and no evidence of migration into burned areas was identified. Once extirpated from a site, populations of most gastropod species are slow to recover. Sites that appear to be suitable snail and slug habitat, but which have been burned in the past, are reported to support few if any species or individuals even after 50 years or longer (Jordan and Black, 2015). Therefore, staff considers O&M impacts to special status invertebrates to be significant and Unavoidable due to the risk of wildfire.

Special Status Fish

Less Than Significant Impact.

Basis for Conclusion. There are no State or federally listed fish expected to occur in the project area. Pit roach, a CDFW species of special concern, has a low potential to occur within the project site. This species, should it occur would be limited to areas supporting perennial flows with moderate gradients, warm temperatures, and mats of vegetation. No other sensitive fish is expected to have a moderate or high potential to occur in the project area. If present, this species could be subject to direct and indirect impacts if work is conducted at or adjacent to streams. With the implementation of staffs recommended COC impacts to this species and other fish if present would be reduced to less than significant levels.

Background and Analysis. The Pit roach is a CDFW species of special concern. There is one CNDDB occurrence approximately 2.7 miles north of the project site, within the Pit River and tributaries (CDFW, 2024e). If present, direct impacts could include increased turbidity or the degradation of water quality. In addition, noise, vibration, or human presence, degradation or loss of stream habitat, changes in hydrology, exposure to herbicides or other hazardous materials, could occur. Vibration could occur from the use of explosives during the excavation of footings in rocky soils or from heavy equipment operating in or near riparian areas.

Direct mortality and the degradation of riparian habitat or water quality. Riparian areas that support suitable stream habitat for these species are limited to perennial and intermittent creeks. Generally, these areas would be avoided except that road improvements would be required in several aquatic areas. Although wet crossings are limited along access roads it is possible that fish could occur in or near some of the small culverts or streams that flow under or across the access roads. Fish that occur in or near wet crossing sites could be more susceptible to water quality impacts or if work

is conducted in waterways. Although removal of vegetation would be minimized in riparian habitats, these activities could result in increases in turbidity and sedimentation to adjacent aquatic habitats without the implementation of BMPs. Sedimentation may be the most detrimental effect to fish and other aquatic organisms if present and unpaved roads are responsible for greater increases in sediment mobility and erosion than either logging or fire (USFS, 2014). Construction of the project would require extensive road improvements, and several crossings would be built to reach WTGs sites. These activities could result in temporary and localized increases in turbidity and sedimentation to adjacent waterbodies that support suitable fish habitat for Cascades. If present, this would be considered a significant impact.

The CDFW have proposed mitigation measures to reduce impacts to sensitive fish and these actions have been incorporated into Staffs recommended **COCs**. To reduce impacts the Applicant would implement **BIO-17** (Sensitive Fish Avoidance Measures), which would require identifying potential fish habitat within the vicinity of work areas, conducting pre-construction surveys for sensitive fish, and limiting activities within wetted portions of the stream. In addition, the measure contains requirements for diverting flow around work areas, monitoring water quality, and preventing sediment laden water from entering the stream.

In addition, **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) and **BIO-11** (Conduct Biological Monitoring During Construction) would be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. **BIO-8** requires the restoration of temporary disturbed areas and providing compensatory mitigation for permanent impacts to riparian vegetation communities. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring.

Exposure to Herbicides or other hazardous Materials and the Spread or Introduction of Weeds or Invasive Wildlife. Invasive weeds have various detrimental effects on aquatic and riparian habitats. They alter water table depths by tapping into previously unused groundwater resources and can also outcompete native species by suppressing native recruitment, consuming water, and nutrient resources, or by shading slower growing plants. Additionally, weeds often do not stabilize soils as well as native vegetation, which can lead to degradation of stream channels and water quality from increased erosion and sedimentation.

Vehicles or equipment could also result in the introduction on invasive wildlife to aquatic habitats. As previously described above for sensitive invertebrates, invasive aquatic species can result in serious effects to native fish and their habitat. Implementation of staffs recommended **BIO-10** (Invasive Species Management Plan) would require the collection of baseline data on invasive species and ensure all vehicles and heavy equipment proposed for use on the project site will be cleaned (including wheels, tracks, undercarriages, and bumpers, as applicable) before delivery. In addition, biological monitors will inspect all equipment entering aquatic areas prior to entry to ensure that con-struc-tion activities do not introduce aquatic invasive species into the project site during construction. If mud or water is present on the equipment, the monitor will require the equipment to be cleaned and if needed treated. Collecting baseline data for the presence of non-native wildlife such as snails and other species will also protect the Applicant by documenting if these species are already present in the project area.

The introduction or spread of invasive weeds would be considered a significant impact under CEQA. To reduce these impacts Staff recommends **BIO-9** (Integrated Weed Management Plan) which would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation.

Direct and indirect impacts could also occur if fish or exposed to herbicides or other hazardous materials due to offsite drift, accidental spill, or vehicle and equipment leaks. Herbicide would likely be used during initial clearing activities. Toxic exposure of herbicides and other hazardous materials to fish can include effects on reproduction, growth, spawning behavior, egg hatchability, and fry survival (Mount and Stephen, 1967). However, Stehr et al. (2009) reported no developmental toxicity observed in response to several herbicides at relatively high exposure concentrations to salmonids at early life stages. If not properly used, these materials can enter rivers and streams by leaching through the soil, overland flow during periods of precipitation, or direct application to stream surfaces (Lorz et al., 1979). Norris (1967) reported that the direct application of chemicals to stream surfaces is the principal mechanism of chemical entry into aquatic systems and this type of contamination can be prevented or minimized using buffer strips and attention to the details during application. To reduce potential exposure to hazardous materials during construction staff proposes **HAZ-1** and **WORKER SAFETY-1** which includes spill prevention and hazardous materials procedures.

Wildfires. Direct and indirect impacts to sensitive fish could also occur if construction activities result in the initiation of wildfires. Construction related impacts from project related wildfires have been discussed above for a variety of species but could have devastating effects to local fisheries and aquatic habitat. To reduce impacts to fish from the initiation of wildfires the Applicant would implement **HAZ-6**, **HAZ-7**, **HAZ-8** which

includes a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS.

Changes to Hydrology and Impeding Fish Passage. Even small changes to a stream channel can result in barrier to fish passage. Smaller and localized barriers such as culverts can block free-flowing river and stream systems, impeding fish migratory patterns and hindering the flow of nutrients. There are several bridges that are currently used to access timber lands in the project area. In addition, it is likely that additional crossings would be installed, or existing bridges expanded to support the passage or WTG blades and other components. Road crossing improvements or maintenance or replacement of existing structures that impedes passage for fish would be considered a significant impact. To ensure these impacts do not occur the Applicant would implement **BIO-17** (Sensitive Fish Avoidance Measures) requires the applicant to conduct pre-construction surveys for these species, identifying potential fish habitat within the vicinity of work areas, and limiting activities within wetted portions of the stream. In addition, the measure contains requirements for diverting flow around work areas, monitoring water quality, and preventing sediment laden water from entering the stream.

Mass grading and expansion of roadways and construction of tower pads could result in increased sediment to stream channels during construction and during storm events. To reduce impacts from sediment or from changes to hydrology the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the SWRCB and would be required to implement a SWPPP. The SWPPP would ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1** and **WATER-2** would ensure compliance with SWPPP requirements. Implementation of these measures would reduce impacts to less than significant.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to native fish. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels except as they relate to wildfires.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction

activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to noise, fugitive dust, and herbicides. O&M activities could include repairs and maintenance to roads and culverts which has some potential to impact native fish either through sedimentation or direct work at or near the drainage. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site. Noise and vibration from the operation of the turbines is not expected to adversely affect fish.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-10** (Invasive Species Management Plan), **BIO-17** (Sensitive Fish Avoidance Measures), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for common wildlife species and could increase during the O&M phase of the project. As previously described the turbines present obstructions and can impact aerial firefighting in the broader project area.

Wildfires influence aquatic ecosystems both directly and indirectly. High intensity wildfire impacts to aquatic systems that result in, direct mortality and habitat destruction are the most detrimental. These include mortality and injury of aquatic and semiaquatic animals, such as freshwater mollusks, amphibians, and fishes, caused by fire through raising water temperatures to lethal levels, possible toxic effects caused by fire-induced changes to stream pH, and acute levels of toxic chemicals (Gresswell, 1999). Substantial indirect effects include post-fire erosion leading to increased sediment loads and debris flows.

Intense fires and related events have killed fish and even caused local extinctions (Dunham et al., 2003). Fires that initiate in the project area and spread to adjacent watersheds can have dramatic impacts to native fish not found on the project site Therefore, staff considers O&M impacts to special status fish to be significant and unavoidable should the project hinder firefighting activities on the project site.

Special Status Amphibians and Reptiles

Cascades frog, foothill yellow-legged frog, coastal tailed frog, California red-legged frog, southern long-toed salamander, and Shasta Salamander.

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Cascades frog, foothill yellow-legged frog, coastal tailed frog, and southern long-toed salamander have a potential to occur in the project area. Shasta Salamander is restricted to a few locations and is not expected to occur. Because the project area is located at the extreme northern range of California red legged frog staff concurs this species is not expected to occur or would have a very low potential. In addition, most of the streams are shallow which could preclude this species from persisting. Direct impacts could include mortality from vehicle collisions, crushing from heavy equipment, entrapment, disruption of behavior (e.g., breeding, movement, foraging) from noise, vibration, or human presence, degradation or loss of foraging habitat, changes in hydrology, exposure to herbicides or other hazardous materials, and exposure to fugitive dust. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. The Cascades frog is state candidate for listing and is a CDFW SSC. Cascade frogs are primarily associated with aquatic habitats where they rely on clean and permanent water sources for survival. Foothill yellow-legged frog, Pacific tailed frog, and southern torrent salamander are CDFW SSC. California red legged frog is a federally listed species and a CDFW SSC. These amphibious species are highly associated with aquatic habitat, and all spend most their lives close to permanent waterbodies.

The Applicant conducted surveys for yellow legged frogs in 2018 and in 2019 to address changes to the development footprint (FWPA, TN 248305-2). Based on feedback from the CDFW the Applicant conducted eDNA sampling at 24 different stream locations in 2019 (FWPA, TN 248308-2). eDNA or Environmental DNA is a method that can detect genetic material from a target species that is present in their surrounding environment. The genetic material can include skin cells, scales, feces, urine, mucous, or other bodily fluids. No evidence of foothill yellow legged frogs was detected during those surveys. However, these surveys were conducted approximately 5 years ago, and the absence of this species cannot be confirmed. Because this species is known from the region and conditions on the site have changed there is possibility this species could occur.

Pacific tailed frogs are restricted to dense, late-successional conifer forests within steep-walled valleys while foothill yellow-legged frog and southern torrent salamander occur in a slightly broader diversity of habitats (Thompson et al., 2016). Old growth forests do not occur in the project area as the area is actively managed for timber production. However, older forests are present in adjacent areas such as the LNF which could provide habitat for this species.

For cascades frog breeding typically occurs from late May to mid-August in lakes, ponds, and wet meadows that hold water throughout the summer, are free of fish, and contain a high percentage of silt in the near-shore habitat (Welsh et al., 2006).

Cascades frogs are associated with proximity to aquatic features during the non-breeding season; however, non-breeding active-season habitat is more variable than breeding habitat (Garwood, 2009). During the non-breeding season, adult frogs often use sites with open, sunny areas, often along the shoreline, which may be favorable because they provide basking and foraging opportunities (Fellers and Drost, 1993). Basking occurs during warm periods, usually on water-covered rocks or along open areas of the shoreline. During periods of inactivity, such as overwintering, frogs will occupy sites in mud at the bottom of ponds, spring-water saturated ground, and other aquatic sites (Pope et al., 2014).

Based on an assessment of the age of the surveys, the presence of perennial water sources, and suitable habitat staff determined that Cascades frog, foothill yellow-legged frog, coastal tailed frog, California red-legged frog, southern long-toed salamander, and Shasta Salamander all have a potential to occur in the project area. Because the project area is located at the extreme northern range of California red legged frog staff concurs this species is not expected to occur.

Habitat in the project area has been subject to a series of events that may have limited the distribution of this species on the site. The area is subject to commercial logging and the burned during the Fountain Fire in 1993. Wildfires influence aquatic ecosystems both directly and indirectly and could be the reason that special status amphibians were not detected by the Applicant. High intensity wildfires and result in mortality and injury of aquatic and semiaquatic animals, such as freshwater mollusks, amphibians, and fishes, caused by fire through raising water temperatures to lethal levels, possible toxic effects caused by fire-induced changes to stream pH, and acute levels of toxic chemicals (Gresswell, 1999). Substantial indirect effects include post-fire erosion leading to increased sediment loads and debris flows.

As a group, amphibians are taxonomically and ecologically diverse; in turn, responses to fire and associated habitat alteration are expected to vary widely among species and among geographic regions (Pilliod et al. in press). Available data suggests that amphibian responses to fire are spatially and temporally variable and incompletely understood, and information of the long-term negative effects of fire on amphibians and the importance of fire for maintaining amphibian communities is sparse for the high number of taxa in North America (Pilliod et al., in press). In a review of the current literature, Hossack and Pilliod (2011) tried to determine if there are patterns that might be informative for conservation and management strategies. Of the seven studies that compared pre- and post-wildfire data on a variety of metrics, ranging from amphibian occupancy to body condition, two reported positive responses and five detected negative responses by at least one species. All four studies that included plethodontid salamanders reported negative effects on populations or individuals. These effects were greater in forests where fire had been suppressed and in areas that burned with high severity.

Given their diversity and complexity in terms of life cycles, many amphibians have evolved and persisted in fire prone regions, possibly due to adaptations to fire disturbances. Some pond-breeding species in forests with high frequency fire regimes rely on the heterogenous landscapes and open conditions created and maintained by fire for long-term population stability (Dodds et al., 2015). Conversely, species that have narrow geographic distributions, are closely tied to specific microhabitat conditions (e.g., soil or water temperatures or cover types), or occur in areas with very long fire-return intervals that may be adversely affected by fire. Although most amphibians breed in aquatic environments, they may be particularly vulnerable to fire-related mortality and habitat disturbances during periods spent in upland environments (Pilliod et al. in press). Even if individuals can avoid fire by occupying wet areas or moving underground, migratory routes back to breeding ponds may no longer be suitable. Fire-related disturbances at the microhabitat level may include the elimination or alteration of important amphibian cover through combustion of understory vegetation and surface materials or filling interstitial spaces in aquatic substrates with ash and sediment. On a broader macrohabitat level, such as lakes or streams, fires may increase solar radiation and water temperatures, alter hydroperiods and nutrient cycling, and enhance productivity (Pilliod et al. in press).

Direct and Indirect Impacts. Because of the age of the surveys, it is possible sensitive amphibians could occur in the project area. Implementation of the project would remove vegetation and result in disturbance to riparian areas at road crossings and where shaded fuel breaks or vegetation would be cleared along access roads. If present, direct impacts to sensitive amphibians could include degradation of riparian habitat and water quality; disruption of breeding behavior; mortality from crushing, trampling, or entrapment; exposure to herbicides and other hazardous materials; and the introduction and spread of chytrid fungus. Indirect impacts could include habitat fragmentation, barriers to dispersal, and the degradation of habitat from long-term alterations to hydrology and invasive weeds.

Direct mortality and the degradation of riparian habitat or water quality. Riparian areas that support suitable breeding and non-breeding habitat for these species are limited to perennial creeks. Generally, these areas would be avoided except that road improvements would be required in several aquatic areas. Although wet crossings are limited along access roads associated with suitable Cascades frog habitat in the project area, it is possible that frogs or salamanders could occur in or near some of the small culverts or streams that flow under or across the access roads. Individual frogs that occur in or near wet crossing sites could be more susceptible to crushing or trampling. Frogs could also become trapped if open excavations are left uncovered. Although removal of vegetation would be minimized in riparian habitats, these activities could result in increases in turbidity and sedimentation to adjacent aquatic habitats without the implementation of BMPs. On a broad scale, sedimentation may be the most detrimental effect amphibians if present and unpaved roads are responsible for greater increases in sediment mobility and erosion than either logging or fire (USFS, 2014). Construction of the project would require extensive road improvements, and several

crossings would be built to reach WTGs sites. These activities could result in temporary and localized increases in turbidity and sedimentation to adjacent waterbodies that support suitable habitat for Cascades frog and other sensitive amphibians. Any impacts to these species would be considered a significant impact.

The Applicant and CDFW have proposed mitigation measures to reduce impacts to sensitive amphibians and these actions have been incorporated into Staffs recommended **COCs**. To reduce impacts the Applicant would implement **BIO-18** (Sensitive Amphibian Avoidance Measures), which would require identifying potential habitat within the vicinity of work areas and limiting activities within protective buffers. In addition, the measure contains requirements for identifying relocation sites and preventing the spread of chytrid fungus (described further below). In addition, **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan) and **BIO-11** (Conduct Biological Monitoring During Construction) would be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-8** requires the restoration of temporary disturbed areas and providing compensatory mitigation for permanent impacts to riparian vegetation communities. **BIO-1** through **BIO-4** would require the Applicant to designate a project Biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring.

Impacts from exposure to fugitive dust would be reduced by **AQ-SC3**, which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits. To reduce impacts from sediment or from changes to hydrology the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the SWRCB and would be required to implement a SWPPP. The SWPPP would ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1** and **WATER-2** would ensure compliance with SWPPP requirements.

Riparian trees and vegetation providing shade in aquatic habitats are key regulators of water temperature while supplying vital shade and cover for aquatic species. Increases in light and temperature can have both negative and positive effects on Cascades frogs

and their habitat. Reproduction occurs in shallow still-water habitats that retain water through the summer and long enough for egg and tadpole development depending on water temperature. Although tadpoles can tolerate a wide range of water temperatures, they tend to aggregate in the warmest areas of their aquatic habitat during the day where temperatures can warm to more than 20°C. However, in shallow meadow breeding pools, daytime water temperatures have been measured at 38°C which seems above their temperature tolerance and appears to induce stress among tadpoles (Pope et al., 2014). More light and warmer water can also stimulate algal growth thus increasing availability to food resources for tadpoles. According to the Pope et al., 2014, activities that preserve open aquatic habitats may benefit the species in the long-term. Most perennial creeks or streams in the project area have thick stands of riparian vegetation along their banks and the project is not likely to result in substantial changes to these areas. As such, the removal of vegetation and removal of riparian vegetation would not be expected to result in considerable alterations in available sunlight or changes in water temperatures in Cascades or other frog habitat within the project area. In addition, staffs proposed **BIO-8** (Habitat Restoration and Vegetation Management Plan) requires the restoration of temporary disturbed areas and providing compensatory mitigation for permanent impacts to riparian vegetation communities.

Disruption of breeding behavior. Direct impacts could also occur if noise results in disturbance or disruption of Cascades frog breeding behavior. Cascades frogs vocalize for a variety of reasons. Advertisement calls, which are typically the most frequent, are made by males during the breeding season to establish territories, repel rival males, and attract females as potential mates. These calls are usually made in or very near bodies of water in areas that are attractive to females for depositing eggs. Disruption of breeding behaviors would occur if construction activities producing noises which mask or interrupt these vocalizations. These noises could result from the use of heavy equipment, chainsaws, vehicles, or while placing the WTGs. Noise-producing activities would be localized and temporary in nature and would be conducted during the daytime. **NOISE-6** limits heavy equipment operation and noisy construction work relating to any project features, including linear facilities, helicopter operation, and rock blasting to a period of Monday through Saturday between the hours of 7:00 A.M. to 7:00 P.M which would reduce noise related impacts to nocturnal calling amphibians. Specific conditions related to blasting would be required for other species and would include seasonal timing, pre-construction surveys, scare charges or warning horns, species relocation and monitoring.

Exposure to Herbicides or other hazardous Materials and the Spread or Introduction of Weeds or Wildlife. Invasive weeds have various detrimental effects on aquatic and riparian habitats. They often alter water table depths by tapping into previously unused groundwater resources. They can also outcompete native species by suppressing native recruitment, consuming water, and nutrient resources, or by shading slower growing plants. Additionally, weeds often do not stabilize soils as well as native vegetation, which can lead to degradation of stream channels and water quality from increased erosion and sedimentation. Exposure to herbicides and other hazardous

chemicals or introduction and spread of invasive weeds would be considered a significant impact under CEQA. To reduce these impacts Staff recommends **BIO-9** (Integrated Weed Management Plan) which would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation. The introduction of exotic wildlife can also result in adverse impacts to native frogs. A Implementation of staffs recommended **BIO-10** (Invasive Species Management Plan) would require the collection of baseline data on invasive species and ensure all vehicles and heavy equipment proposed for use on the project site will be cleaned (including wheels, tracks, undercarriages, and bumpers, as applicable) before delivery.

Direct and indirect impacts could also occur if frog adults, tadpoles, eggs, or habitat is exposed to herbicides or other hazardous materials due to offsite drift, accidental spill, or vehicle and equipment leaks. Studies have concluded that most commercial herbicides are practically nontoxic to frogs (Folmar et al., 1979; Mann and Bidwell, 1999; Howe et al., 2004). However, herbicides that contain or are combined with surfactants have been shown to be toxic to aquatic life, including several species of ranid frogs (Folmar et al., 1979; Mann and Bidwell, 1999; Howe et al., 2004). Surfactants may affect aquatic organisms by damaging gills, which may be why tadpoles are found to be more sensitive than juveniles or adults (Mann et al., 2009). Detrimental effects of other hazardous materials on amphibians range from lethal to sublethal including decreased growth and development and increased developmental abnormality frequency, susceptibility to diseases, and behavioral alterations (Serrano et al., 2012). To reduce potential exposure to hazardous materials and limit sources of ignition during construction staff proposes **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1** which includes spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS.

Introduction of Chytrid Fungus. Direct impacts would occur if construction activities lead to the introduction and/or spread of chytrid fungus. Recent studies have found the fungal pathogen Batrachochytrium dendrobatidis (Bd), which causes the amphibian disease chytridiomycosis, to be widespread across the range of Cascades frog in California (Pope et al., 2014). While some populations appear relatively unaffected by the disease, others seem to be experiencing decreased survival, especially juvenile frogs (Pope et al., 2014). According to New South Wales Office of Environment and Heritage (NSWOEH) (2018), the chytrid fungus is transferred by direct contact between frogs and tadpoles or via zoospores in infected water. As a condition of **BIO-18** (Sensitive Amphibian Avoidance Measures) requires the applicant to conduct pre-construction surveys for these species and relocate them to adjacent habitat if detected in the proposed work areas. As a part of this measure the Fieldwork Code of Practice developed by the Declining Amphibian Populations Task Force will be followed to ensure

that diseases are not conveyed between work sites by the biologist(s) if they are required to relocate any amphibian species.

The project is not likely to create barriers to dispersal or result in habitat fragmentation for these species. Cascades frog rarely moves away from water and move between breeding and non-breeding habitats within riparian corridors. The placement of WTGs would primarily occur in densely forested upland habitats and vegetation removal in riparian areas where Cascade frog has the highest likelihood to occur would be limited. Unlike most amphibians, Pacific tailed frogs do not undergo mass migrations to and from breeding habitats, thus reducing the risk of mass mortality while crossing roads. Mullally and Cunningham (1956) reported that frogs avoid crossing dry ground over short distances, but foothill yellow-legged frogs have been documented moving overland at distances of 66-400 meters (217 1312 feet) (Vredenburg et al., 2005). Anurans, such as foothill yellow-legged frog, are well known victims of vehicular mortality because their life histories require them to move between habitats and, consequently, to crossroads (Fahrig et al., 1995). The seasonal life history of foothill yellow-legged frogs may make them susceptible because they move throughout three different habitats, one for each of breeding, feeding, and overwintering. Southern torrent salamanders are most often found in contact with water but will occasionally move into riparian vegetation. It is during these movements between aquatic and upland environments, that special-status amphibians would be most susceptible to crushing, trampling, or entrapment. Because riparian corridors would remain intact it is unlikely that the project will not create additional barriers to movement for these species or increase impacts from edge effects.

Barriers to Dispersal. Roads have been identified as a prominent barrier to amphibian movement within and between habitats. Roads that serve as barriers or partial barriers may have a strong effect on Cascades frog, particularly for metapopulations that interact occupy discreet habitat patches and are linked by occasional dispersal (Bradford, 1991). Road improvements would include the expansion of new roads and the widening of existing dirt roads maintenance and/or replacement of existing unpaved roads and culverts, and no new construction of roads is proposed. These activities would be designed to minimize vegetation and soil disturbance to the extent feasible. Culverts, where possible, would be replaced by low-water crossings which could enhance habitat for species such as Cascades frog that are highly associated with riparian and aquatic habitat. Construction of the project could also alter local drainage patterns and change the hydrology in the project area. This could increase risk to frogs who may hide or forage in low water crossings. Monitoring during construction would reduce the risk of mortality during activity periods. To ensure that road crossings do not result in adverse impacts to sensitive frogs the applicant would implement **BIO-18** (Sensitive Amphibian Avoidance Measures) requires the applicant to conduct pre-construction surveys for these species and relocate them to adjacent habitat if detected in the proposed work areas and **BIO-17** (Sensitive Fish Avoidance Measures) requires the applicant to limit activities within wetted portions of the stream. In addition, the measure contains requirements for diverting flow around work areas,

monitoring water quality, and preventing sediment laden water from entering the stream.

To reduce impacts from sediment or from changes to hydrology the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the SWRCB and would be required to implement a SWPPP. The SWPPP would ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1** and **WATER-2** would ensure compliance with SWPPP requirements.

Operation and Maintenance

Significant and Unavoidable Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to sensitive amphibians. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Operation noise could also adversely affect species by masking predators or vocalizations during breeding. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. These would include loss of habitat, crushing, trampling, inadvertent removal, exposure to construction noise, fugitive dust, and herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. Common wildlife using these areas would be subject to displacement or mortality depending on the specific O&M activity. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site. Wildlife would also be subject to new baseline noise levels and vibration from the operation of the turbines. Noise would emanate from the turbine blades whenever they are operational. The turbine's noise level is approximately 56 dBA, at the base of the turbine which is slightly higher than the daytime and nighttime ambient noise level of 42 dBA per day. This could result in predator masking in some circumstances. Vibration from the WTGs is expected to be minimal and would be damped within a short distance. See **Section 5.9** (Noise and Vibration) for a more thorough discussion of this topic.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5**

(WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan), **BIO-10** (Invasive Species Management Plan), **BIO-16** (Sensitive Amphibian Avoidance Measures), **BIO-17** (Sensitive Fish Avoidance Measures), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for common wildlife species and included in a discussion related to the current distribution of ranids in the project area. As previously described the turbines present obstructions and can impact aerial firefighting in the project area, increasing the impact of wildfires.

Wildfires have the potential to adversely affect frogs on a local and regional scale. Many amphibians have evolved and persisted in fire prone regions, possibly due to adaptations to fire disturbances. In addition, some pond-breeding species in forests with high frequency fire regimes rely on the heterogenous landscapes and open conditions created and maintained by fire for long-term population stability (Dodds et al., 2015). Conversely, species that have narrow geographic distributions, are closely tied to specific microhabitat conditions (e.g., soil or water temperatures or cover types), or occur in areas with very long fire-return intervals that may be adversely affected by fire. Although most amphibians breed in aquatic environments, they may be particularly vulnerable to fire-related mortality and habitat disturbances during periods spent in upland environments (Pilliod et al. in press). Even if individuals can avoid fire by occupying wet areas or moving underground, migratory routes back to breeding ponds may no longer be suitable. Fire-related disturbances at the microhabitat level may include the elimination or alteration of important amphibian cover through combustion of understory vegetation and surface materials or filling interstitial spaces in aquatic substrates with ash and sediment. On a broader macrohabitat level, such as lakes or streams, fires may increase solar radiation and water temperatures, alter hydroperiods and nutrient cycling, and enhance productivity (Pilliod et al. in press). Fires that initiate in the project area and spread to adjacent watersheds can have dramatic impacts to amphibians not found on the project site. Therefore, staff considers O&M impacts to special status amphibians to be significant and unavoidable should the project hinder firefighting activities on the project site.

Western Pond Turtle

Construction

Significance Conclusion. *Less Than Significant with Mitigation*.

Basis for Conclusion. Western pond turtle has the potential to occur in portions of the project site in both riparian and upland habitats. This species primarily occurs in stream with relatively deep and slow-moving water but can be found in shallow pools with emergent vegetation. In winters they estivate in upland areas outside the stream

channel. They can also be encountered in upland areas when moving between water sources or to a nest or wintering site. With the implementation of staffs recommended COC impacts to western pond turtle would be reduced to less than significant levels.

Background and Analysis. The western pond turtle is proposed for federal listing as threatened and is a CDFW SSC. If western pond turtle becomes formally listed as federally threatened or endangered, take would only be authorized under the context of the appropriate permits issued by USFWS. Pond turtles were not detected during surveys conducted by the Applicant but are known from the region. This species could occur in the larger perennial streams and intermittent drainages, and small ponds that occur throughout the project area. If present, they would also be expected to occur in the adjacent upland buffers.

Western pond turtles are normally found in and along riparian areas and proximity of nesting sites to aquatic habitat are reliant on availability but are generally within 400 feet (200 m) of permanent or relatively permanent aquatic features (Jennings and Hayes, 1994). However, gravid females have been reported to nest more than 1,300 feet away from the nearest aquatic habitat in response to drying of local waterbodies or other factors (Holland, 1994). Preferred nesting habitat usually occurs in unshaded, south-facing slopes with little or no tree canopy cover with generally less than a 25 percent slope. (Rosenberg et al., 2009). Western pond turtle basking sites can include tree stumps, logs, mud banks, cattail mats, and other objects (Bury and Germano, 2008). Juvenile and adult turtles are commonly observed at basking sites, although they are extremely wary animals and often dive into the water at any perception of danger. The lengths of basking periods of western pond turtles, when disturbed by human activity, has been shown to be significantly shorter than periods without disturbance (Nyhof, 2013). Shorter basking periods can cause aquatic turtles to forfeit proper thermoregulation, possibly resulting in their ability to carry out necessary behaviors and physiological processes.

Western pond turtles also spend a considerable amount of time on land for overwintering. Overwintering sites tend to include a much broader array of vegetation structure than nesting or basking sites. Shrubby, open, and forested environments have all been used by western pond turtles for overwintering with access to some solar radiation appearing to be an important factor (Rathbun et al., 1992; Holland, 1994; Rathbun et al., 2002). In one study in northern California, 10 of 12 radio-tagged turtles overwintered in forested upland habitat, buried in duff, while the remaining two overwintered in aquatic habitat (Reese and Welsh, 1997).

Direct and indirect impacts to western pond turtle, if present, could include the loss of nesting, basking, or overwintering habitat; mortality or injury from crushing, trampling, or entrapment; degradation of riparian habitat and water quality; exposure to herbicides and other hazardous materials; and the introduction and spread of non-native wildlife species. Indirect impacts to western pond turtle could include habitat

fragmentation and edge effects and degradation of habitat from long-term alterations to hydrology and invasive weeds.

Direct Mortality, Habitat Loss, and Habitat Fragmentation. The greatest potential risk to western pond turtle would be the damage or destruction of inconspicuous nesting sites or the mortality of turtles present in upland areas. Since pond turtles often nest communally, damage or destruction of a nesting site could result in injury or mortality to incubating eggs or hatchling turtles and could disrupt egg-laying activities of adult female turtles. However, the amount of suitable nesting habitat that would be disturbed would represent a small fraction of habitat that would likely be occupied.

Western pond turtle nests can be difficult to detect as they are typically covered by the female with a mixture of vegetation and dirt. Juvenile western pond turtles typically move from nesting sites in adjacent upland or riparian areas to perennial waters in the spring (Buskirk, 1992). It is during these periods that they would be most vulnerable to potential risks from crushing by vehicles and equipment or trampling by foot. Hatchlings are very small, often less than one inch. They are also cryptic and may be difficult to observe when moving through vegetated areas. Adult turtles could be subject to crushing, trampling, or entrapment during seasonal migrations between aquatic and upland habitats associated with nesting or overwintering sites if work coincides with their movement.

Basking sites are commonly found within immediate proximity to water so that individual turtles can quickly retreat upon sensing danger. Because the project would limit vegetation removal within riparian areas, the loss of suitable basking sites for western pond turtle would not occur. Considering the variability of habitats utilized by western pond turtle, overwintering habitat may be the most vulnerable and it is anticipated that some would be impacted by construction activities.

Road improvement activities would occur along new and existing access roads and would support construction of the WTG's. Some of these activities could occur within suitable western pond turtle nesting, basking, and overwintering habitat.

The project is not expected to result in habitat fragmentation or create new barriers to dispersal for this species. Despite their ability to use a wide range of aquatic and upland features, suitable aquatic habitats are relatively rare across much of the project area and occur primarily in the larger perennial and intermittent drainage and small ponds. Riparian habitats within the project area, and where western pond turtles are most likely to occur, would be largely left intact except at new road crossings, however upland buffer areas would be subject to large scale grading and vegetation removal in many areas. In addition, the region supports numerous large creeks and rivers where pond turtles could occur. Because most dispersal activity occurs within riparian corridors, barriers to western pond turtle dispersal movement would not occur. Western pond turtles are affected by both native and non-native predators including most

carnivorous or omnivorous animals large enough to consume adult turtles, hatchlings, or eggs (Rosenberg et al, 2009). Increased predation occurs due to a lack of adequate cover. This could occur where new WTGs are constructed or where roads overlap riparian areas. However, the Applicant would restore temporarily disturbed areas and fuel breaks would be managed to support low-growing vegetation communities that would continue to provide cover from predation for adult and juvenile western pond turtles.

To reduce impacts, the Applicant would implement **BIO-19** (Western Pond Turtle Avoidance Measures), which would require pre-construction surveys, avoidance buffers within potential western pond turtle habitat, and monitoring of work areas if avoidance buffers are not possible. It should be noted that the detection of pond turtle nest sites is extremely difficult, and many sites will be overlooked and would likely be subject to mortality. As part of **BIO-19** if pond turtles are detected the applicant would be required to conduct extensive monitoring and conduct routine searches prior to and during construction.

BIO-5 (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, and **BIO-11** (Conduct Biological Monitoring During Construction) would also be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. The condition includes limiting work to daylight hours, inspecting pipes and excavations, conducting pre-construction surveys, monitoring and many other protective measures.

BIO-8 requires the restoration of temporary disturbed areas with low growing native species if they occur in a shaded fuel break, replanting oaks and or other riparian vegetation that is temporarily disturbed and providing compensatory mitigation for permanent impacts to riparian or sensitive vegetation communities. **FOREST-1** and **FOREST-2** would result in the preservation of timber lands which could be used by this species in other areas should they occur adjacent to creeks supporting this species. **BIO-1** through **BIO-4** would require the Applicant to designate a project Biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring.

Changes in Hydrology and Degradation of Water Quality. Ground disturbing activities such as the use of heavy equipment during vegetation removal, road construction, blasting, or the construction of culverts or other new water crossings, could also increase the sediment transport to drainages during rain events. This could result in a degradation of habitat quality although pond turtles appear tolerant of murky and sediment laden water.

To reduce impacts from sediment or from changes to hydrology the Applicant would gravel the roads and implement BMPs to control off site sediment transport. The roads would also be designed to control storm water and would direct flows to existing and new culverts. In addition, as the project will be required to obtain a Construction Stormwater General Permit from the SWRCB and would be required to implement a SWPPP. The SWPPP would ensure that offsite sediment transport is limited and consistent with permit requirements. **WATER-1** and **WATER-2** would ensure compliance with SWPPP requirements.

Introduction of Invasive Plants or Wildlife Species. The removal of timber and other vegetation would include herbicide use on unwanted plants, including weeds, invasive species, and tree stumps within the project area. Direct impacts to Western Pond turtle or occupied western pond turtle habitat could occur if the species or habitat are exposed to herbicides or other hazardous materials due to offsite drift, accidental spill, or vehicle and equipment leaks. Western pond turtles are particularly sensitive to harm from chemical contaminants since their broad diet and long-life span are conducive to accumulating relatively large amounts of contaminants over time. Contaminants can kill turtles directly or indirectly by removing prey base, degrading habitat quality, and increasing the risk of disease (Holland, 1991). Excessive herbicide use may result in the loss of vegetative cover suitable for hatchling, juvenile, and adult turtles; however, a potentially useful role for herbicide use is in maintaining sparse vegetation on nest areas (Rosenberg et al., 2009). Potentially hazardous materials, including fuel, engine oil, and lubricants could leak or accidentally spill onto the ground or into waterways. Bury (1972) reported on the effects of a diesel spill on a California stream fauna. Thirty pond turtles captured over one month after the spill had swollen necks and eyes and sloughed off pieces of epidermis on their appendages. However, the Applicant would use only those herbicides that have been approved by the CEC based on evaluations of toxicity, solubility, soil adsorption potential, and persistence in water and soil.

Any direct or indirect contact of western pond turtle individuals and/or eggs or exposure to herbicides or other hazardous materials or the degradation of water quality from increased erosion and sedimentation would be considered a significant impact under CEQA. The Applicant has proposed a series of measures to reduce the risk of herbicide use, prevent and contain hazardous spills, and prevent and or fight wildfires. To reduce potential exposure to hazardous materials and limit sources of ignition during construction (discussed previously for vegetation communities) staff has incorporated these measures into proposed including **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1** which includes spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS.

The accidental introduction or spread of non-native plants and wildlife species into aquatic habitats can have adverse effects on western pond turtles and turtle

populations through predation or competition for resources. New Zealand mudsnails, quagga mussels, and zebra mussels, which have been found in many lakes and river systems in California, can outcompete and reduce the number of native aquatic invertebrates that a watershed's aquatic fauna rely on for food. Although none of these species is known to occur in the project area the introduction could be devastating to local aquatic populations.

To reduce these impacts Staff recommends **BIO-9** (Integrated Weed Management Plan) which would require the development and implementation of a weed control plan to identify and treat invasive weeds, ensure that all equipment and vehicles are cleaned and inspected prior to delivery at the project site, and require ongoing inspections to locate and treat any new infestations found during construction and or operation. **BIO-10** (Invasive Species Management Plan) would ensure all vehicles and heavy equipment proposed for use on the project site are cleaned (including wheels, tracks, undercarriages, and bumpers, as applicable) before delivery to the project site. In addition, biological monitors will inspect all equipment entering aquatic areas prior to entry to ensure that construction activities do not introduce aquatic invasive species into the proposed project site during construction.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to western pond turtles. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Because of the risk of wildfires even with the implementation of staff's recommended COCs impacts would remain significant and unavoidable.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. These would include loss of habitat, crushing, trampling, exposure to noise, fugitive dust, and herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. Western pond turtles using these areas would be subject to displacement or mortality depending on the specific O&M activity. As it is very difficult to locate pond turtle nests staff assumes some would be lost during O&M activities. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site. Wildlife would also be subject to new baseline noise levels and vibration from the operation of the turbines. Noise would emanate from the turbine blades whenever they are operational. The turbine's noise level is approximately 56 dBA, at the base of the turbine which is slightly higher than the daytime and nighttime ambient noise level of 42 dBA per day. This could result in predator masking in some circumstances or increased vigilance for pond turtles that

occur near the noise source. Vibration from the WTGs is expected to be minimal and would be damped within a short distance. See **Section 5.9** (Noise and Vibration) for a more thorough discussion of this topic.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-10** (Invasive Species Management Plan), **BIO-19** (Western Pond Turtle Avoidance Measures), **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for common wildlife species and included in a discussion related to the current distribution of western pond turtles in the project area. As previously described the turbines present obstructions and can impact aerial firefighting in the Proposed Project Area, creating a greater hazard.

Because of the need for thermoregulatory, foraging, and refuge sites, reptiles are highly dependent on habitat structure and fire has been shown to reduce their abundance and limit movements (Setser and Cavitt 2003; Valentine et al., 2012). Wildfires would remove nesting and cover sites and likely result in mortality to any turtles caught in upland areas. Because pond turtles use both aquatic and upland habitat their eggs and young can be very susceptible to wildfires. Fires that initiate in the project area and spread to adjacent watersheds can alter habitat, fill pools supporting this species and affect aestivation and egg laying sites in other areas. Therefore, staff considers O&M impacts to western pond turtles to be significant and Unavoidable should the WTGs hinder aerial firefighting activities on the project site.

Special Status Mammals

Except for bats, impacts to special status mammals are described below. Common and special status bats have been grouped with avian species due to similar life history characteristics such as flight and use of roost sites.

Ringtail or California Wolverine

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Ringtail is a State fully protected species and has the potential to occur in portions of the project site in both riparian and upland habitats. This species is curious and will enter pipes, vehicle cavities, electrical boxes, and other project

components. California wolverine is a state-threatened a state fully protected species. This species has not been detected in this region for many years and there is a low potential for California wolverine to occur in the project area. This species is included because there have been recent observations in other forests in northern California and due to the long-term nature of the project. With the implementation of staffs recommended COCs impacts to these species would be reduced to less than significant and would meet the fully protected standard required by CDFW regulations.

Background and Analysis. Direct impacts to ringtail and wolverine could include loss of habitat, injury or mortality of individual ringtails or wolverine, disturbance, or destruction of natal dens during the pup-rearing season from noise, dust or human presence, and exposure to herbicides and other hazardous materials. Blasting could result in den displacement or startle these species from refugia. Indirect impacts to ringtail could include the degradation of habitat due to the introduction and spread of invasive or noxious weeds and habitat fragmentation.

Habitat Loss and Fragmentation. Construction includes the removal of vegetation from woodland and forest communities that could support breeding and denning habitat for Ringtails. Although most of the area is actively logged and burned during the Fountain fire the dense conifer woodland planted after the fire provide shelter and foraging habitat. In addition, after the fire, many of the trees were felled which provide likely denning locations for this species. In addition, this species is often found within 0.6 miles (1 kilometer) of a permanent water source (Ahlborn, 2005) which are common across the project area. The degradation of riparian areas has been identified by the USFS as a potential threat to the species on NFS lands (Stephenson and Calcarone, 1999). The loss of habitat would include a conversion of previously logged areas and existing forests to managed fuel breaks and cleared areas surround the WTGs. In addition, land would be cleared to support the electrical substation and other project components. The loss of habitat, while adverse would constitute only a small change from baseline conditions (i.e., actively logged areas) and likely increase access to small fossorial animals that would be associated with the managed fuel breaks. In addition, this species would be expected to forage on birds and bats that are killed from the operation of the WTGs.

Wolverines are typically associated with large home ranges where they travel long distances over rough terrain. The availability and distribution of food is likely the primary factor in determining wolverine movements and home range size (USFWS, 2024d). The amount of habitat for wolverine that may be affected in relation to the large home ranges that this species occupies and the expansive habitat available throughout the region would be small. In addition, the transition from dense forest habitat to low-growing native vegetation communities around the WTGs and shaded fuel breaks could provide suitable foraging areas for the opportunistic wolverine should they ever become established in any portion of the ROW. They would also be expected to feed on the carcasses of birds that are stuck killed when colliding with WTGs and other project facilities.

For both species, the proposed project is not expected to substantially increase habitat fragmentation. Ongoing logging would continue to occur, and managed areas would provide vegetative cover. Impacts to riparian vegetation would reduce cover at some locations however generally riparian corridors would remain and the species would have access to these areas for foraging and other life history requirements. To reduce impacts from habitat loss the Applicant would be required to implement **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. **FOREST-1** and **FOREST-2** would result in the preservation of timber lands which could be used by these species. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention.

Injury or mortality of individuals or the disturbance or destruction of natal dens. Ringtails are shy, solitary animals that tend to avoid interactions with humans. Much of their time is spent foraging for food at night and occasionally dusk. Ringtails most often use hollow trees, rock piles, cliff crevices, or abandoned burrows for denning sites (Ahlborn, 2005). They can also use woodrat middens which have been detected on the project Site and adjacent project area. They change dens frequently and an individual rarely spends more than three days in the same shelter. However, females with young remain in the same den for 10 to 20 days after giving birth. After that time, dens may be changed daily (Poglayen-Neuwall and Toweill, 1988). Implementation of the project has the potential to result in injury or mortality to ringtails and could result in the abandonment of natal dens should they occur during construction. During construction, ringtails could be at risk from vehicle collisions along project access roads or interactions with project equipment. This species will investigate parked vehicles, equipment, and enter uncapped pipes and could enter the WTG towers or nacelles if left open. This species has also been found using electrical boxes and other small spaces that could be present during construction. They may also frequent areas where crews leave food waste or open unsecured trash cans.

The California wolverine is a solitary animal that typically lives in remote areas away from human settlements. The species naturally occurs at very low densities and is rarely and unpredictably encountered where they do occur (USFWS, 2024d). Wolverines have not established breeding populations in California, so impacts to breeding behavior or natal dens would be extremely unlikely. Female wolverines use natal dens that are excavated in the snow. Persistent, stable snow greater than 5 feet deep appears to be a requirement for natal denning because it provides security for offspring and buffers cold winter temperatures (USFWS, 202d). While this condition occurs in the project area there is a very low potential for this species to be encountered during construction.

Given their elusive nature, it is likely that any individuals of either species present near work areas would quickly disperse into adjacent habitats. However, if a natal den is present vegetation removal or construction activities could result in harm to young or adult animals. Blasting could also disrupt den sites or force animals to become active during daylight hours which would increase predation risk. Although the removal of habitat would be considered negligible on a range-wide scale, the loss of microhabitats, such as downed logs, brush piles, or small cavities that provide denning habitat would be considered a significant impact. Direct loss to either of these species or mortality to either of these species would not be authorized as these species are considered fully protected by the State.

To reduce impacts, the Applicant would implement **BIO-20** (Small Mammal Avoidance Measures) requires the Applicant to conduct surveys for ringtail and wolverine and establish buffers for any potential den sites. This would include searching for tracks, scat, and likely den sites. Camera trapping or the use of medium to detect den use by the species would also be required. In addition, all pipes, equipment, and potential areas where this species could occur would require daily inspection and or capping. During construction, portable toilets would be required to have screened vents to prevent entrapment of small mammals, bats, and birds.

Implementation of **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction) would also be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project and highlight the requirement to inspect pipes, cavities, and ensure all trash is collected daily and stored in secured containers. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. The condition includes limiting work to daylight hours, inspecting pipes and excavations, conducting pre-construction surveys, monitoring and many other protective measures. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species if they occur in a shaded fuel break, replanting oaks and or other riparian vegetation that is temporarily disturbed and providing compensatory mitigation for permanent impacts to riparian or sensitive vegetation communities. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during all vegetation and ground disturbance is occurring. Implementation of these COCs would avoid take of the species and reduce project related impacts to less than significant.

Exposure to herbicides and Other Hazardous Materials. While it is unlikely that ringtails or wolverines would be directly exposed to herbicides during implementation of the project, ancillary effects may include consuming vegetation or animals that have been exposed. Ringtails are omnivores and specific dietary items are largely selected as a function of their seasonal abundance (Poglayen-Neuwall and Toweill, 1988). Principal prey items include small rodents, rabbits, and insects while acorns, berries, and nectar

are also consumed. Direct exposure to herbicides or other hazardous materials or secondary exposure from consuming contaminated prey could occur would be considered significant. Use of rodenticides that contain toxins for these species would not be allowed.

Herbicide use would be used to control weeds, treat cut stumps or unwanted vegetation, and facilitate the transition of managed fuel breaks and vegetation management areas around project components. If allowed to proliferate, invasive weeds can displace native vegetation and create such an unfavorable environment for wildlife that some plant and wildlife species may be lost from an area. The introduction and proliferation of invasive weeds that displace native plant resources, fragment habitat, or increase the risk of wildfire.

As described for impacts to native vegetation the Applicant has proposed a series of measures to reduce impacts from improper herbicide use and to reduce the risk of accidently spills of chemicals or other materials. To reduce potential exposure to hazardous materials and limit sources of ignition during construction staff incorporated these measures into proposed **COCs** including **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1.** These measures include spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS. With the implementation of these COCs impacts would be reduced to less than significant.

Operation

Significant and Unavoidable Impact for Ringtail and *Less Than Significant with Mitigation Incorporated* for Wolverine

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to ringtail and to a limited degree wolverine. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project, except in the event of a large uncontrolled wildfire. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels except as they relate to wildfires.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. Most areas supporting suitable denning habitat would have previously been removed however this ringtail could occur around project facilities. Impacts could include vehicle strikes, entrapment, trampling, exposure to noise, fugitive dust, and herbicides. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site. Noise and vibration from the operation of the turbines could mask predators for ringtails foraging near WTG sites. Wolverines are not

expected to be subject high levels if impacts from O&M activities as this species may avoid the area once developed and has a limited distribution in the region. However, over the life of the project this species may become more common in California mountains.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-20** (Small Mammal Avoidance Measures), **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-10** (Invasive Species Management Plan), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described above for common wildlife species and could increase during the O&M phase of the project. As previously described the turbines present obstructions and can impact aerial firefighting in the broader project area. Should a fire initiate on the project site it could spread to adjacent wildlands that support ringtail and in an unlikely situation wolverine.

Stand replacing wildfires can have adverse effects to a variety of small mammals. Some species can flee an area while others may seek shelter and be lost in the fire. Fires that initiate in the project area and spread to adjacent watersheds can result in loss of habitat and direct mortality to slow moving or cryptic species in areas far removed from the project site. Even on a local scale, wildfires that initiate on the project site and are difficult to extinguish because the WTGs inhibit aerial firefighting can result in loss of important habitat for this species particularly in areas supporting downed wood such as previously logged areas or the replacement stands planted after the Fountain fire. Therefore, staff considers O&M impacts to ringtail to be significant and Unavoidable should the WTGs hinder firefighting activities on the project site. Because of the low potential for wolverine to occur impacts would be considered less than significant with the proposed COCs.

Gray Wolf

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. The gray wolf is a state and federally endangered species. There are currently seven confirmed wolf packs in northern California, ranging from Siskiyou County in the north as far south as Tulare County. CDFW has noted that gray wolves have passed through or adjacent to the project site in recent years, and a suspected wolf track was documented at the project site in the winter of 2018 (FWPA, TN 248288-6). An adult female gray wolf was found dead in Shasta County in February 2020 (KRCRTV, 2020). Therefore, there is a moderate potential for this species to occur

in or near the project site during construction. With the implementation of staffs recommended COCs impacts to this species would be reduced to less than significant levels.

Background and Analysis. Direct impacts to gray wolf could include loss of habitat, injury or mortality of individual wolves through vehicle collisions, disturbance, or destruction of den or rendezvous sites, human presence, and exposure to herbicides and other hazardous materials. Blasting could startle wolves in adjacent habitat. Indirect impacts could include the degradation of habitat due to the introduction and spread of invasive or noxious weeds and habitat fragmentation.

Habitat Loss and Fragmentation. Implementation of the project would remove native upland habitats including conifer woodlands, chaparral, native and non-native grasslands, riparian habitats, and wet meadows that could be used by this species. Most of this habitat is in an existing managed timber area currently subject to ongoing timber harvesting. Habitat conditions in the project area south of the existing PG&E transmission line corridor are characterized by patchwork of previously logged areas and stands of proposed or recently planted plots. North of the transmission line corridor, the area is dominated by stands of recently planted conifers (approximately 30 years of age) with a few older stands. It is likely that wolves move though these types of habitat and recent detections in the region suggest this species has the capacity to occupy this area. Deer forage in this area which support a local prey base for wolves.

The loss of habitat in the project area is not likely to result in adverse impacts to wolves as they currently have limited presence in the region and can use these areas for foraging. Dense wooded areas would remain available to them, in the region and most of the project area consists of open fragmented habitat. In addition, to reduce impacts from habitat loss for other species, the Applicant would be required to implement **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention. **FOREST-1** and **FOREST-2** would result in the preservation of timber lands which could be used by this species.

Project Related Disturbance and Exposure to Herbicides or other Hazardous Materials. The use of heavy equipment and ground disturbance, herbicide use, and use of hazardous chemicals could result in direct and indirect impacts to gray wolf natal dens or rendezvous sites if present. Road traffic during construction would be extensive with over 47,000 deliveries and up 200 project workers occurring during construction. Traffic, noise, and human presence could adversely affect wolves either moving through or using the area.

Most gray wolf dens are located near water, usually within 100 to 200 meters, and are active between mid-March to mid-June. Dens typically consist of excavations in the soil, but can also include hollow logs or trees, beaver lodges, pit excavations, and rock caves (Fuller, 1989). After 1 to 2 months, natal dens are abandoned for an open area called a rendezvous site. Here, the pups are guarded by a few adult pack members while the rest of the pack hunts (Ballard et al., 1987).

Although very little is known about the degree of gray wolf resistance to construction-related stress and human disturbance, there is evidence that many gray wolves will either avoid active construction areas altogether or will adapt to increased human presence where preferred denning and foraging habitat is present (Thiel et al., 1998). In remote wilderness areas, wolves appear to have a lesser tolerance for human disturbance. For example, in open tundra of northern Alaska, wolves seemed to be intolerant of humans approaching to less than 0.8 kilometers (Chapman, 1979). However, when protected from human exploitation wolves sometimes tolerate humans close to dens and pups. In Denali National Park, one female kept her pups within 100 meters of a road and tolerated humans taking closeup pictures of the pups for at least 27 days (Mech et al., 1998). Thiel et al. (1998) provide several additional examples demonstrating the tolerance that wolves can exhibit to nearby human interactions. These include a pack of at least three adults and five pups that occupied a rendezvous site for approximately one month within 100 meters of an active gravel pit, where a noisy stone crusher operated day and night, and where large trucks and bulldozers worked daily.

Because of their large home ranges and high mobility, gray wolves would not be directly exposed to herbicides or other hazardous materials. However, wolves are apex predators with a wide variety of prey species ranging from large ungulates to small rodents and birds and secondary exposure could occur if wolves consume prey items that have been contaminated.

If present during construction, gray wolves would likely avoid areas where disturbance from human activities are occurring. Nonetheless, the abandonment of dens and rendezvous sites or the exposure to herbicides or hazardous materials would be considered a significant impact.

To reduce impacts, the Applicant would implement **BIO-21** (Gray Wolf Avoidance Measures) requires the Applicant to conduct surveys for gray wolves and avoid active dens and rendezvous areas. Surveys would require pre-construction surveys for tracks and camera trapping for gray wolves, a cessation of construction if a wolf is detected within 500-feet of construction, and coordination with CDFW throughout project activities to determine potential wolf activity in the project area. Implementation of **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-5** would

require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project and highlight the potential for this species to occur, provide notification requirements, and ensure all trash is collected daily and stored in secured containers. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. **BIO-11** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during construction. Implementation of these **COCs** would avoid take of the species and reduce project related impacts to less than significant.

Operation

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to gray wolves over the life of the project. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the proposed project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced compared to the project. These would include exposure to noise, human disturbance, nighttime lighting, fugitive dust, and herbicides. O&M activities could include repairs and maintenance to roads and culverts which has some potential to impact native fish either through sedimentation or direct work at or near the drainage. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described for common wildlife species and could increase during the O&M phase of the project. The turbines present obstructions and can impact aerial firefighting in the project area and could result in the spread of wildfires to the broader region. The highest risk to wolves would be when the female is denning or shortly after the birth of the pups. However, post construction wolves may have reduced presence in project area due to operational traffic and noise. In addition, ongoing land uses including timber harvesting would continue which would likely limit the presence of wolves in some areas. In addition, wolves are far ranging and have the potential to move away from some fires.

To reduce impacts from all O&M activity, the applicant would implement the same measures described above. These include **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-11** (Conduct Biological Monitoring During

Construction), **BIO-21** (Gray Wolf Avoidance Measures), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Oregon Snowshoe Hare, Sierra Nevada Mountain Beaver, Pacific Marten, Fisher, Sierra Nevada Red fox, and American Badger.

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Fisher are the most likely species to occur in the project area and be subject to project related direct and indirect impacts. However, each of these species has some potential to occur in or near the project area. With the implementation of staffs recommended COCs impacts to these species would be reduced to less than significant levels.

Background and Analysis. The Oregon snowshoe hare is a CDFW SSC (CDFW, 2024b). It occurs at middle and higher elevations near montane riparian vegetation, in young or dense stands of firs, lodgepole pines, and subalpine forests, and in chaparral (CDFW, 2024f). This hare was not detected during surveys, and there are no iNaturalist records within 10 miles of the project area (iNaturalist, 2024). However, portions of the project area provide suitable habitat and there is a moderate potential for Oregon snowshoe hare to occur in some areas.

Sierra Nevada Mountain Beaver is a CDFW SSC and is associated with moist forested areas that support a dense understory of vegetation. They are a burrowing species and require friable soils and access to riparian areas. This species was not detected in the project area during surveys conducted by the Applicant. There are no iNaturalist records in the region however there are CNDDB records greater than 10 miles from the project site (CDFW, 2024e). This species has a low potential to occur.

The Sierra Nevada red fox DPS was listed as federally endangered in 2021 and is also State-listed as threatened. Only 18-39 individuals belonging to this DPS remain in the wild and sightings have been limited to federal lands in Alpine, Fresno, Inyo, Madera, Mono, and Tuolumne Counties over 150 miles south of the project area. Therefore, individuals from the Sierra Nevada DPS are not expected to occur. However, should they occur in the region at a later date they would be protected by the COC's proposed for other small mammals.

The fisher is a CDFW SSC. The fisher is considered present in suitable habitat throughout the project area. The Pacific marten is not a sensitive species outside of BLM or FS lands but is presumed present in Lassen County and likely occurs in low densities. There are iNaturalist records for this species in the region.

The American badger is a CDFW SSC. It is found throughout California, except the extreme North Coast, in dry, open grassland, scrub, and forest habitats, usually in areas with sandy loamy soils and where small mammal prey are abundant (Ahlborn, 1990;

Quinn, 2008). American badger is considered to have a low potential to occur where suitable open habitat is present such as meadows, grasslands, and open chaparral communities. It is not expected to occur throughout most of the conifer dominated woodlands associated with the project. It may be found along cleared areas including the existing transmission line right of way.

Direct impacts to these species could include loss of habitat, injury or mortality of individual animals, disturbance, or destruction of natal dens during the pup-rearing season from noise, dust or human presence, and exposure to herbicides and other hazardous materials. Blasting could result in den displacement or startle these species from refugia. These animals could also be trapped in excavations or become entrapped in water tanks or other equipment. Indirect impacts could include the degradation of habitat due to the introduction and spread of invasive or noxious weeds and habitat fragmentation.

Habitat Loss and Fragmentation. The project would result in direct and indirect impacts to native and non-native vegetation communities and other land cover types (See **Table 5.2-2**).

Martens are broadly limited to conifer-dominated forests and other nearby vegetation types. Horizontal heterogeneity may be important because it allows martens to fulfill their needs in small areas, reducing travel distances. As presented in Hunter Jr. (1990), martens may especially benefit from the small-scale horizontal heterogeneity that results from the natural dynamics of old-growth forests. For example, the death of large old trees results in snags or fallen logs. In this position, they are important for overhead cover, denning sites, and winter resting sites. Further, opening of the canopy by the loss of large old trees admits sunlight to the forest floor, stimulating herbaceous growth which may subsequently attract or produce an increase in prey.

Suitable habitat for Pacific marten, fisher, and American badger is required for denning, resting, foraging, and dispersal and these species will utilize a variety of environments to meet these needs. Complex physical structure, especially near the ground, appears to address three important life needs for Pacific marten and fisher as it provides protection from predators, access to the spaces where most prey are captured, and provides protective thermal microenvironments, especially in winter (Buskirk and Powell, 1994).

Fishers are found in a variety of low- to mid-elevation forest types that typically are characterized by a mixture of forest plant communities and seral stages (Raley et al., 2012). These landscapes are suitable for fisher if they contain adequate canopy cover, den and rest structures of sufficient size and number, vertical and horizontal escape cover, and prey (Raley et al., 2012). Although fishers occupy a variety of forest types and seral stages, the importance of large trees for denning and resting is significant. Dispersing juvenile fishers can move long distances and traversing various habitats and

barriers, including rivers, roads, and rural communities (Aubry and Raley, 2006; Weir and Corbould, 2008).

Martens and fishers are associated with old growth forests which do not occur in the project site. However, there are isolated stands of older trees within the project area and in the adjacent LNF. Larger trees are also more common near riparian areas. These areas could support foraging and movement for these species. In areas where these habitats are removed, low-growing, native vegetation communities would be promoted and sustained through long-term vegetation management. Removing habitat can result in increased predation risk if martin or fishers, mountain beaver, red fox, or American badgers are forced to leave the cover of densely wooded areas. Expanding open areas between habitat patches would increases the risk of predation by coyotes, mountain lions and other predators. However, use of the project area by these species would likely remain limited to densely forested areas and these species may limit movement across existing open areas subject to ongoing logging activities; however, fishers are known to cross open areas to some degree but predation risk increases. Similarly, riparian corridors would largely remain intact which are often used by these species for movement.

Impacts from fragmentation to Oregon snowshoe hare are expected to be less than significant. In northern California, snowshoe hares occupy diverse habitats including conifer forests and woodlands with a preference for young forests with abundant understories. The presence of adequate cover appears to be the primary determinant of habitat quality and is more significant than food availability (Carreker, 1985). Snowshoe hares require dense, brushy, usually coniferous cover that provides protection from avian and terrestrial predators (Carreker, 1985). However, a wide variety of habitat types are used if cover is available (Sullivan, 1995). Construction activities would result in the removal of some preferred cover habitat for snowshoe hare as densely concentrated areas of conifers would be removed to support the placement of the WTGs or access roads. However, this would represent a small fraction of suitable cover habitat available within the region. In addition, this area is managed for commercial timber production and ongoing disturbances are common during the management of the plantations.

In addition, snowshoe hare preference for travel cover is relatively more open (Sullivan, 1995). Low-growing, native vegetation communities would be left intact and promoted around the WTGs and the shaded fuel breaks, providing adequate cover for hares during travel between habitats or while fleeing predators. In addition, riparian corridors would remain. Adverse effects to habitat for American badger are not expected as this species prefers more open habitats and has a low potential to occur in the project area.

Construction of the project would not likely pose a risk of exacerbating habitat fragmentation for martins and fishers in the region. The area is in an actively managed timber production area much of the project area is either highly fragmented from current timber operations or supports relatively young vegetation stands of conifers

which does not support the complex habitat requirements for martins and fishers. For species such as red fox they are considered to have a very low potential to occur and could still forage in existing habitats. Habitat for mountain beaver, Oregon snowshoe hare, and American beaver would also remain post development. Based on the limited potential for American badgers to be present it is unlikely the project would result in habitat fragmentation or limit access to habitat for foraging. Badgers are much less selective and will occupy a greater diversity of vegetation types. Suitable habitat is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils (Hoefler and Duke, 1990). However, habitat loss would be considered a significant impact under CEQA.

To reduce impacts from habitat loss the Applicant would implement **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed management Plan), **BIO-11** (Conduct Biological Monitoring During Construction) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas which could be used for foraging by some of these species. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention. **FOREST-1** and **FOREST-2** would result in the preservation of timber lands which could be used by these species. With the implementation of these **COCs** impacts from habitat loss would be reduced to less than significant.

Direct Mortality and Disturbance. Each of these species are relatively uncommon and solitary animals except during the mating season. All also share both diurnal and nocturnal activity patterns. Given the mobility and elusive nature of each of these species, it is likely that they would disperse into nearby habitat, avoiding human interactions during initial construction activities. However, should these species be present, injury or mortality of individuals during construction, development or new access roads, and access road use could occur. Martens use a variety of structures for natal dens including tree cavities, snags, stumps, fallen logs, woody debris, and rockpiles (Baker, 1993). Female fishers have been reported to be obligate cavity users for birthing and rearing young, although hollow logs are occasionally used as well (Aubry and Raley, 2006). Trees used by fishers for denning are typically large and considerable time (>100 years) is required for most suitable cavities to develop (Raley et al., 2012). Unlike martens and fishers, badger young are born and reared in burrows dug in the ground in dry, often sandy, soils, usually in areas with sparse overstory cover (Ahlborn, 1990). Sierra Nevada mountain beavers excavate burrows in soft soils where their young are kept. These species dens could be subject to destruction during

construction activities. In the summer, red fox is more positively associated with higher elevations more so than use of specific vegetation communities (Perrine, 2005). In winter, habitat selection appears to be linked more to the extent of forest comprised of large trees of greater than 60 cm DBH and greater than 40 percent canopy closure (Perrine, 2005; Benson et al., 2005).

Elevated levels of noise and human presence from construction of the project could result in the displacement or abandonment of active natal dens if present. The effects of disturbance to martens, fishers and badgers using dens have not been well studied. However, reproductive females with dependent young are potentially more susceptible to disturbance than adult males or juveniles since they must shelter and provision their young in dens. Although females will readily move their young to alternate dens, this requires energy, and the risk of predation may be relatively high when transporting kits to new den sites. Yet, fishers have been known to occupy habitats in the immediate vicinity of active logging operations, suggesting that the noises associated with these activities, or their perceived threat did not result in either displacement or territory abandonment (Spencer et al., 2015). Additionally, martens occasionally appear fearless of humans and will approach closely so that at times they may seem tame, but this impression is usually transient (Halvorsen, 1961). Breeding individuals or populations of Pacific marten, fisher, or American badger that inhabit remote and isolated areas with relatively low ambient noise and human interactions could be more vulnerable and adversely affected if present within the project area.

Snowshoe hares are shy and secretive animals that spend most of the day in shallow depressions, or “forms,” scraped out under clumps of ferns, brush thickets, and downed piles of timber (Sullivan, 1995). The species is primarily crepuscular to nocturnal; however, diurnal activity level increases during the breeding season, which varies considerably with latitude, location, and yearly events (such as weather conditions and phase of snowshoe hare population cycle) (Giusti et al., 1992). Although this species would be expected to avoid human interactions and disperse into nearby habitats during construction activities, some individuals may be subject to injury or mortality during vegetation removal, road improvements, clearing areas around WTG’s and access road use should they seek cover in dense vegetation subject to clearing. Natal dens are typically constructed aboveground in a nest of matted grasses and newborn hares are fully furred and mobile at birth. Juvenile hares are usually more active and less cautious than adults. Consequently, natal dens and newborn and juvenile hares may be more vulnerable to impacts associated with vehicle strikes and mechanical crushing (Maser et al., 1981).

Similarly, red fox are secretive animals with a very limited distribution. They breed from December to March which could make locating them extremely difficult if working in the snowy conditions found on the project site. However, the likelihood of encountering this species is extremely low.

The direct loss or disturbance to these species would be considered significant. The Applicant proposed a basic mitigation measure in the Shasta County EIR to reduce impacts from the project. In addition, the CDFW provided a series of measures that would avoid or minimize impacts to special status mammals. Staff incorporated these measures into **BIO-20** (Small Mammal Avoidance Measures). This COC requires the Applicant to conduct surveys for these species and avoid active dens if detected. In addition, this condition includes prescriptive reporting requirements. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. The condition includes limiting work to daylight hours, inspecting pipes and excavations, conducting pre-construction surveys, monitoring and many other protective measures. Implementation of **BIO-5** (WEAP) and **BIO-11** (Conduct Biological Monitoring During Construction) would also be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project and highlight the potential for these species to occur, provide notification requirements, and ensure all trash is collected daily and stored in secured containers. **BIO-1** through **BIO-4** would require the Applicant to designate a project biologist that would oversee compliance with biological requirements and ensure that full time biological monitoring is conducted during construction. Implementation of these **COCs** would avoid take of the species and reduce project related impacts to less than significant. Impacts to State Listed Species including the Sierra Nevada red fox would be avoided.

Introduction of Non-native Weeds, Exposure to Herbicides or other Hazardous Materials. If allowed to proliferate, invasive weeds can displace native vegetation and create an unfavorable environment for plants and wildlife that these species depend upon for sustenance. Invasive weeds often increase the potential risk of wildfires which could be detrimental to these species due to their relative inability to escape over long distances. Given the shy and elusive nature of each of these species, it is unlikely that any would be directly exposed to herbicides or other hazardous materials during the construction of the project. However, secondary exposure from the consumption of contaminated prey because of improper use, spill, or drift could occur. Consequences of prolonged exposure could include reduced reflex time, increased susceptibility to disease and pathogens, reduced thermoregulatory capacity, or mortality (Spencer et al., 2015). Spills of hazardous materials and other project related chemicals could also increase risk if consumed or become contaminated on an animal's fur.

As described for impacts to native vegetation the Applicant has proposed a series of measures to reduce impacts from improper herbicide use and to reduce the risk of accidently spills of chemicals or other materials. To reduce potential exposure to hazardous materials and limit sources of ignition during construction staff incorporated these measures into proposed **COCs** including **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1.** These measures include spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS. With the implementation of these COCs

impacts would be reduced to less than significant. Impacts to State Listed Species including the Sierra Nevada red fox would be avoided.

Operation and Maintenance

Less Than Significant with Mitigation Incorporated for Sierra Red Fox, *Significant and Unavoidable Impact* for Oregon Snowshoe Hare, Sierra Nevada Mountain Beaver, Pacific Marten, Fisher, and American Badger.

Basis for Conclusion. Sierra Red Fox have a limited potential to occur in the project Area. Oregon Snowshoe Hare, Sierra Nevada Mountain Beaver, Pacific Marten, Fisher, and American Badger could occur, and O&M activities have the potential to result in direct and indirect impacts to these species over the life of the project. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the project. Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Implementation of staffs recommended COC's would reduce impacts to less than significant levels except for wildfires.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced compared to the project. These would include exposure to noise, human disturbance, nighttime lighting, fugitive dust, and herbicides. O&M activities could include repairs and maintenance to roads and culverts which has some potential to impact these species use of adjacent habitat particularly should mountain beaver be present. O&M activities associated with the project could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site.

Risk of Wildfires During O&M. The risk of wildfires during O&M was described for common wildlife species and could increase during the O&M phase of the project. The turbines present obstructions and can impact aerial firefighting in the project area and could result in the spread of wildfires to the broader region. This could adversely affect densely forested areas in adjacent lands including the STNF and the LNF which likely support higher concentrations of these species compared to the project site.

To reduce impacts from all O&M activity except for wildfires, the applicant would implement the same measures described above. These include **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-10** (Invasive Species Management Plan), **BIO-20** (Small Mammal Avoidance Measures), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**.

Except for Sierra red fox which as a very limited potential to occur in the project area, project related impacts from the risk of wildfires to Oregon Snowshoe Hare, Sierra Nevada Mountain Beaver, Pacific Marten, Fisher, and American Badger would be considered significant and unavoidable.

Bats and Birds

Construction related impacts to common and special status bat and avian species are presented initially followed by operational impacts. The analysis is presented in this format because most construction related impacts to bats and nesting birds are similar in that both species often use roost or nest sites that are located in either natural or anthropogenic structures (i.e., bridges, structures, mines etc.). In most instances impacts to these types of features can be avoided or reduced by the implementation of staffs recommended COCs.

Operational impacts are more difficult to minimize as there are limited opportunities to prevent avian and bat species from flying through the rotor swept area or colliding with towers, WTG's, transmission lines, and other project components.

Common and Special Status Bats

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Seventeen bat species have the potential to occur within the project site. Some of these include spotted bat, western mastiff bat, pallid bat, western red bat, hoary bat, Townsend's big-eared bat, long-eared myotis, fringed myotis, and Yuma myotis. Five of these species are considered species of special concern by the CDFW. These species typically forage during periods of darkness but are active at dawn and dusk. They can occur under bridges, in rock crevices, under exfoliating bark, or within brush piles. Some bats can day roost on the shaded portions of large trees, rock outcrops, and structures. With the implementation of staffs recommended COCs impacts to these species would be reduced to less than significant levels.

Background and Analysis. The Applicant conducted acoustic surveys for bats between April 30 and November 13, 2017, at seven sites that represented potential WTG locations and in a riparian area that was determined to be attractive to bats (FWPA, TN 248307). Two of these sites were in an area north of Highway 299 which is no longer a part of the project. However, the data remains useful for an assessment of general bat use. Seventeen bat species were identified from the bat acoustic survey data including five specials of special concern. These included western red bat, pallid bat, Townsend's big-eared bat, spotted bat, and western mastiff bat (FWPA, TN 248307). However, the calls for western red bat, Townsend's big-eared bat, and pallid bat could not be verified upon review by an experienced bat biologist. Therefore, for the purposes of this analysis these species are considered to have a potential to occur

in the project area. There were no State or federally listed bat species detected during the surveys and none are expected to occur in the project area.

Direct and Indirect Impacts. Direct impacts to non-listed and special status bats, if present could include loss of habitat; disturbance to roosting, maternity, or hibernacula sites; mortality or injury; exposure to herbicides or other hazardous materials; and the introduction or spread of white-nose syndrome. Indirect impacts could include long-term habitat type conversion and edge effects.

Direct Mortality or Displacement. The decline of bat populations is often due to roost site disturbance or loss. Due to their sensitivity to noise, human presence, and other disturbance factors, roost protection is vitally important. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on the species. Given the wide variety of structures that bats utilize for roosting, it is possible that vegetation removal, grading, and other construction activities would result in the direct removal or disruption of some of these sites and some individual bats may be killed or injured, particularly if present during vegetation removal in forested areas. For example, Townsend's big-eared bats are very susceptible to human disturbance, and females are known to completely abandon their young when disturbed. The loss of maternity and hibernation roosts has been cited as the most significant factor contributing to their decline throughout their range (Miner and Stokes 2005). Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. This bat prefers foraging on terrestrial arthropods in open habitats and regional populations and individuals may show selective prey preferences (Johnston and Fenton 2001). They may also occur in open coniferous forests. Pallid bat roosts are very susceptible to human disturbance, and urban development has been cited as the most significant factor contributing to their regional decline (Miner and Stokes 2005). Special-status bats could occur within almost all habitats in the project area and could utilize a variety of features, including hollow trees, exfoliating bark, snags, rocky outcrops, and human-made structures (i.e., bridges) as roosting, maternity, and hibernacula sites. However, roosting sites and maternal colonies of pallid bat and western red bat are more commonly found in live or hollow trees at habitat edges and some myotis species will use exfoliating bark or tree snags. The project area does support some large trees that could be used by a variety of bats however most of the site consists of younger timber stands and large trees with cavities are limited. It is likely that bats could be present at or near some of the larger bridges and within some of the rocky outcrops that occur intermittently across the site. Any disruption to sensitive bat roost sites or individual bats would be considered a significant impact.

The applicant did not note the presence of any caves or mines in the project area that could be used for a maternity of hibernaculum site which reduces risk to these species during winter months when the bats would be vulnerable to disturbance. Blasting could also disrupt bats should they occur in adjacent areas.

There is ample foraging habitat in the project area for bats and bats can collide with vehicles or be injured if they are foraging at or near the ground during dusk and dawn. Reducing vehicle speeds and limiting work to daylight hours would reduce collision risk for most species of bats. Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. Indirect effects include the loss of foraging habitat due to type conversion, nighttime lighting that exposes bats to predation, and alteration in prey bases. Bats may ultimately be attracted to project features such as night lighting as these features may attract prey items such as insects. Fugitive dust from vehicle traffic or vibration from grading or drilling could also adversely affect bats should they day roost near access roads or work areas.

The applicant has not proposed specific avoidance measures for bats and potential roost sites occur in the project area (i.e., large trees, brush piles, bridges, and rock outcroppings). Staff and CDFW have developed pre-construction surveys and impact avoidance measures for bats to reduce impacts to potential hibernacula, maternity colonies, or day roosts should they occur. To reduce impacts to common and sensitive bats the Applicant would implement **BIO-22** (Special-Status Bat Avoidance Measures), which would require surveys and avoidance buffers to identify active roosting sites and prohibit activities that could cause disturbance. Work would be directed around the roost sites until the bats have left the site or the roost or colony is abandoned. Under certain circumstances non-sensitive bat roosts can be disturbed by carefully opening the structure during periods of activity and after inspection closing off or removing the structure. Should this occur, alternative roost sites and or bat boxes would be required. This measure would also require that if sensitive roost sites, maternity colonies, or hibernaculum are found that blasting would not be allowed if noise or vibration limits would disturb the nest. In addition, any large trees with the potential to support bats would be removed in a two-step process to allow local bats time to leave a tree proposed for removal.

In addition, **BIO-5** (WEAP) **BIO-7** (General Impact and Avoidance Measures), and **BIO-11** (Conduct Biological Monitoring During Construction) would be required. **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the Project and **BIO-1** through **BIO-4** would require the Applicant to designate a Project Biologist that would oversee compliance with biological monitoring and survey requirements. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. Impacts from fugitive dust would be mitigated by implementation of **AQ-SC3,** which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. Dust suppressants would be durable non-toxic soil stabilizers, and many other activity-specific control measures would be applied to reduce fugitive dust and to ensure activities do not create visible dust emissions during construction. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits. **NOISE-6** limits heavy equipment operation and noisy

construction work relating to any project features, including linear facilities, helicopter operation, and rock blasting.

Construction of the project is not expected to introduce White-Nose Syndrome to the project area. According to the White-Nose Syndrome Response Team (WNSRT) (2021), white-nose syndrome is a disease that affects hibernating bats and is caused by the fungus Pseudogymnoascus destructans (or Pd). Pd grows in cold, dark places and attacks the bare skin of hibernating bats. As it grows, Pd causes changes in bats that make them become active more than usual resulting in burning fat reserves needed to survive in the winter. Bats with the syndrome may exhibit unusual behavior such as flying outside during cold winter days. Pd spores can last a long time on surfaces including clothes, shoes, and outdoor gear. So, even though humans do not get white-nose syndrome, they can unknowingly transfer the fungus from one place to another. The most effective defense against the risk of spreading white-nose syndrome is avoiding dank areas where Pd may occur. To date in California, white-nose syndrome appears to be limited to detections of Pd near the town of Chester in Plumas County, located approximately 46 miles south of the project area (WNSRT, 2021). It is unlikely that construction of the project would result in the introduction or spread of white-nose syndrome unless workers have been exposed in other regions. However, to reduce the risk staff proposes **BIO-5** (WEAP) which will include specific language on avoiding areas where bats can occur and cleaning clothes, shoes, and other equipment prior to entering the job site.

Habitat Loss and or Fragmentation. Implementation of the project is not expected to result in significant impacts to bat foraging habitat. The project is in an area managed for timber production which will continue during the life of the project. In addition, clearing timber stands and managing vegetation around the WTGs and shaded fuel breaks would promote low-growing, native vegetation communities which would retain foraging habitat for many bats. Likewise, impacts to riparian areas where bats likely concentrate would be limited and similar habitats that are abundant in adjacent areas and throughout the region would remain. A variety of habitats and strategies are also used for foraging. For example, western red bats prefer to hunt over streams and forest openings and clearings while, due to flight and echolocation style, Townsend's big-eared bats are more suited to forage among the canopies and along the edges of mature forested stands (Gruver and Keinath, 2006). Many of these features would remain in the adjacent SNF and LNF. Further, multiple studies have noted increased activity along forest edges for a variety of bat species and many, such as Townsend's big-eared bat, western red bat, and long-eared myotis, are well adapted to edge habitats. Bats may benefit from linear elements such as wooded edges both when foraging and commuting as these edges provide habitat for insects and may serve as landmarks along the way to foraging grounds (Jantzen, 2012). Further, to reduce energetic requirements associated with long-distance flights, some species benefit from roosting as close as possible to open foraging grounds (Taylor et al., 2020); however, this could result in adverse impacts from their proximity to the WTG's. Although open habitats may appear to increase the risk of predation for bats, there is little evidence in

North America to support this. The limited documentation of predation of bats by owls or diurnal hawks occurred outside of maternity colonies where bat concentrations are much higher than elsewhere on the landscape (Barclay et al., 1982, as cited in Jantzen, 2012).

To reduce impacts from habitat loss or fragmentation, the Applicant would implement **BIO-8** (Habitat Restoration and Vegetation Management Plan) **FOREST-1**, **FOREST-2**, and **BIO-9** (Integrated Weed Management Plan). These measures would ensure that foraging habitat for bats is preserved by promoting low growing vegetation that would provide a base for insects and preserving forest habitat.

Wildfires could also be initiated during construction (See impacts to Native Vegetation and Landforms for a through discussion of this topic). For additional information on wildfire risk please refer to **Section 5.7** (Hazards, Hazardous Materials, and Wildfire). To reduce potential sources of ignition during construction staff proposes **HAZ-6** and **WORKER SAFETY-1** which includes a Fire Prevention Plan (FPP) and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS. These measures include educating workers on the risks and sources of wildfires and ensuring that adequate firefighting tools and equipment are present during construction. Smoking will not be allowed in wildland areas and vehicles would carry basic fire tools including fire extinguishers. Non-emergency work would also be prohibited during Red Flag events which are weather events that are typically associated with elevated temperatures, low humidity, and wind.

Exposure to Herbicides and Hazardous Materials. While it is unlikely that bats would be directly exposed to herbicides or other hazardous materials, secondary effects could occur because of consumption of contaminated food or water resources. If ingested, herbicides and other hazardous materials can cause death or reduce reproductive ability (Gruver and Keinath, 2006). To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends HAZ-1 which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected.

Common and Special Status Birds

The project area provides foraging, cover, or breeding habitat for a variety of resident and migratory birds and numerous avian species were detected during surveys conducted by the Applicant. The diversity of birds in the project area is a function of the types of habitats that occur, including dense forests, recently planted pine plantations, chaparral, riparian, and other small meadow community types. Except for a few non-native birds such as European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*), the loss of active bird nests or young is regulated by the Federal Migratory

Bird Treaty Act (MBTA) and Fish and Game Code Section 3503 and would be considered an adverse impact.

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Construction of the project could result in direct and indirect impacts to nesting bird species protected under California Fish and Game Code sections 3503.5 and 3511 and the Migratory Bird Treaty Act. Construction activities, primarily though removal of vegetation, could cause destruction or abandonment of active nests or the mortality of adults, young, or eggs. With the implementation of staffs recommended COCs impacts to these species would be reduced to less than significant levels.

Habitat Loss, Construction Disturbance, and Nest Loss. Direct impacts to nesting birds could include the loss or degradation of suitable habitat, disturbance of breeding behavior, destruction of active nests or eggs, and exposure to herbicides and other hazardous materials. Indirect impacts could include long-term habitat type conversion and edge effects, and increased potential for collision with WTGs and electrocution and powerline collisions (Collisions with WTGs and other project components are discussed under operational impacts). The introduction and spread of non-native weeds can also degrade habitat and increase fire risk.

Potential impacts to nesting birds include increased noise levels from heavy equipment used during the removal of timber, human disturbance, exposure to fugitive dust, the spread of noxious weeds, and disruption of breeding or foraging activity. Construction during the breeding season could result in the displacement of breeding birds and the abandonment of active nests.

Sound levels in natural areas vary depending on the season and weather conditions. Wind blowing through vegetation can increase sound levels compared to calmer days and for short periods of time could rise to a level that interferes with a bird's ability to hear predators or mask reproductive calls. Similarly, high levels of natural sounds can occur from flowing water which could have a similar effect. However, these noise sources are typically short term, the species has evolved within these conditions, or the species has adapted to seek refugia during periods where excessive noise conditions occur.

How construction noise affects a specific bird can vary greatly on the location of a nest and the species nesting. The scientific record contains extensive research documenting the negative effects of anthropogenic generated sound levels to many species of nesting birds. Noise disturbance due to construction, traffic, and other anthropogenic activity has been found to have detrimental impacts on pairing success and clutch size in some bird populations (Habib et al., 2007; Halfwerk et al., 2011). However, other more disturbance tolerant birds such as house finches and king birds appear to

successfully nest near noise producing sources and some activity build nests within active construction sites. However, there may be underlying risks to birds who elect to nest near locations with elevated sound levels such as a construction project, highway, or other sound generating facility.

Conversely, many other birds are intolerant of any human disturbance. Anthropogenic noise may affect populations by masking or distorting male song patterns or inducing a stress response that negatively impacts fitness (Habib et al., 2007; Kleist et al., 2018). Barber et al., (2009) noted that elevated noise levels can result in masking of predators and decrease communication between individual groups of birds. They also found that regardless of the mechanisms involved their study suggested that noise decreases a direct measure of fitness and hatching success, in the western bluebird, a species previously thought to be noise tolerant. Many riparian birds and other neo-tropical migrants are also adversely affected by noise and human disturbance. Reijnen et al., (2006) demonstrated that for two species of European warbler (*Phylloscopus* spp.), sound levels between 26 dB(A) and 40 dB(A) reduced breeding density by up to 60 percent compared to areas without disturbance (1995). In addition, while current sound thresholds used by many regulatory agencies for most birds in California are approximately 60 dB(A), this level may still adversely affect breeding success for some species. These data suggest disturbance from adjacent road noise and urban development may be a contributing factor in the use of habitat adjacent to developed areas. However, avian responses to noise and human disturbance may be a function of the perceived threat rather than on the intensity of noise. Therefore, increased noise levels would likely alter and/or preclude the breeding activities for many common and sensitive bird species known to occur in the project area.

Birds could also be exposed to increased risk of collisions with vehicles on Highway 299 and along project access roads. This risk may be more likely for species such as owls who are often struck by vehicles along access roads during periods of low light or birds that are attracted to roadkill.

Depending on the species, birds may actively nest on the ground close to equipment or even on idle construction equipment. In other ecosystems in southern California, birds have been documented nesting on vehicles, foundations, construction trailers, and other equipment left overnight or during a long weekend. In areas where construction may be phased, birds may quickly utilize these features as nest sites. Many of the birds that would be likely to use these types of nesting substrates are common species such as ravens, house finches, and doves. Nesting birds, including raptors may also attempt to nest on partially constructed turbines or within open cavities in the WTGs. Some cavity nesting species may also become trapped should they enter turbine housings, vertical pipes, outhouse vents, or other equipment. Cavity nesting birds may be difficult to detect should they be present in trees planned for removal. Birds may also nest on or under the various bridges that occur in the project area.

For species such as Peregrine falcons which do not build nests like most other birds noise or human disturbance could affect this species should they nest in direct line of sight of the project on one of the adjacent hillsides. This species usually lay their eggs in a shallow indentation, or "scrape," high on a cliffside or manmade structure, such as a building or bridge. This species will rarely use trees or snags for nesting sites when adequate cliffsides are available. Human disturbance may disrupt the reproductive behavior of peregrine falcons (Herbert and Herbert, 1969; Ellis, 1982). The timing of the disturbance to nest sites seems critical (Ratcliffe, 1993). Nesting falcons are intolerant of excessive human disturbance and may abandon nest sites; however, once eggs are present, this usually only occurs after frequent or prolonged disturbance that keeps the adults away from the nest for long periods of time (Ratcliffe, 1993).

Suitable breeding habitat for peregrine falcon occurs along steep cliffs and deep canyons throughout the project area. Peregrine falcons foraging habitat is linked to prey abundance and availability and they will utilize all seral stages of forested, woodland, and chaparral habitats. However, they have been shown to generally avoid foraging in associations with canopy coverage greater than 70 percent (Luensmann, 2010).

Any project related impact that results in the loss of nesting habitat, disturbance of breeding behavior, destruction of nests or eggs, exposure to herbicides or other hazardous materials, and mortality or injury to individual birds would be considered a significant impact. The Applicant and CDFW proposed measures to reduce impacts to nesting birds. Staff has incorporated language from these measures into **BIO-23** (Nesting Bird Avoidance and Minimization Measures). This measure requires pre-construction surveys for nesting birds and the establishment of non-disturbance buffers where needed to avoid adverse effects to active nest sites. This measure also requires the development of a Nesting Bird Management Plan that contains the types of birds that have the potential to nest in the project area, where they likely nest, prescriptive language on who is qualified to conduct nesting bird surveys and monitor active nests, the methodology of the surveys, when surveys will be required, and the frequency they must be repeated. For example, conducting one pre-construction survey with negative results only provides a short window where work can be conducted with reasonable assurance there are no active nests. Birds can and do nest in and near construction projects and some species can construct nests over a short weekend or if project activities temporary move to another location. The measure will also require the establishment of a nesting bird log to track active nests and provide routine reports to the CEC on nest status.

Staff also recommends **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction). These measures would educate workers regarding the legal protections for nesting birds and who to contact should a nest be detected, replace, and restore native vegetation communities, and require the identification and treatment of

weed infestations throughout the life of the project. The weed management plan would contain prescriptive measures including conducting preconstruction surveys and treatment of weeds prior to ground disturbance should the work occur when plants are visible.

Habitat Fragmentation. Clearing vegetation may also result in adverse effects from habitat fragmentation for some species and reduce future nesting opportunities. Conversely there will be some species of birds that benefit from creating edge habitats or more open areas that are preferred for foraging and or nesting. As this area is actively managed for timber production and currently consists of a patchwork of recently logged, mid seral (i.e., timber planted after the Fountain Fire) or scheduled for logging areas staff considers the risk of habitat fragmentation for common birds to be low and less than significant. However, the management of vegetation below the WTG's and along the shaded fuel breaks would provide habitat for a variety of shrub and low vegetation foragers.

Exposure to Herbicides and Hazardous Materials. Although the risk is low, individual birds could be exposed to herbicides. This could occur when treating weed infestations or stumps following the removal of vegetation. Even if birds do not come into direct contact with herbicides or other hazardous materials, they can be affected via food-chain concentrations, particularly when these materials are widely applied across a landscape. This can occur when fish, rabbits, or other small herbivores consume material exposed to contaminants or contaminant residue. The contaminant accumulates in the tissue of the predatory animal through bioaccumulation as exposed prey items are consumed. Even at non-fatal levels, the bioaccumulation of some contaminants can result in a reduction in the amount of food consumed, loss of weight, changes in physical activity, and a decrease in the production, fertility, and hatchability of eggs (Cox, 1991). Peregrine falcons are not expected to be subject to direct exposure to herbicides or other hazardous materials. However, ancillary effects could potentially occur because of food chain dynamics. Peregrine falcons are generalists and show a tendency to capture virtually any prey that is available (Thelander, 1977). Prey items primarily consist of small to medium-sized birds, shrews, voles, snowshoe hares, and larger birds are also occasionally consumed. Given this variation, peregrine falcons could be adversely affected if prey items have been exposed to, or accumulated relative levels of, hazardous materials. Birds that glean insects off treated vegetation could also be exposed to some degree.

To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected.

Olive-sided flycatcher, yellow-breasted chat, yellow warbler, Vaux's swift, Lewis's woodpecker, and other special status nesting birds and raptors.

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Construction of the project could result in direct and indirect impacts to sensitive nesting bird species protected under California Fish and Game Code sections 3503.5 and 3511 and the Migratory Bird Treaty Act. As described above for common species activities could cause the destruction or abandonment of active nests or the mortality of adults, young, or eggs. With the implementation of staffs recommended COCs impacts to these species would be reduced to less than significant levels under CEQA.

Construction Disturbance and Nest Loss. The Applicant identified several special status birds during their avian point counts and avian use surveys. Some of these include Vaux's swift (*Chaetura vauxi*), Yellow warbler (*Dendroica petechia brewsteri*), Olive-sided flycatcher (*Contopus cooperi*), and Lewis's woodpecker (*Melanerpes lewis*) which are all California species of special concern. Several species of raptors were also observed or have a high potential to occur. These include Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), and sharp-shinned hawk (*Accipiter striatus*).

Direct and indirect impacts to nesting birds would be the same as described form common birds and raptors and could include the loss of suitable habitat, disturbance of breeding behavior, destruction of active nests or eggs, and exposure to herbicides and other hazardous materials. Construction noise from construction equipment, blasting or helicopter use may also disrupt birds. Indirect impacts could include long-term habitat type conversion and edge effects, and increased potential for collision with WTGs and electrocution and powerline collisions (Collisions with WTGs and other project components are discussed under operational impacts).

Habitat Loss and Habitat Fragmentation. Clearing vegetation may result in adverse effects from habitat fragmentation for some species or reduce nesting opportunities. For example, Lewis's woodpecker prefers open forests, ranging from low-elevation riparian areas to higher-elevation burns and pine forests for breeding. This species requires snag trees either standing, dead, or partly dead for nesting. Rather than excavating cavities in wood, this species selects trees already well decayed. Olive-sided flycatcher breeding habitat is primarily associated with late-successional conifer forests with open canopies (Verner, 1980). They occur more abundantly in broad areas with a matrix containing clear-cuts or otherwise highly fragmented forest than in less fragmented or unfragmented landscapes (Altman and Sallabanks, 2000). In Douglas-fir forests in northwestern California, the species is detected more often at forest edges than in forest interiors. Preferred foraging habitat consists of unobstructed airspace within openings and over forest canopies with exposed perches (Altman and Sallabanks, 2000). Within occupied habitat, the removal of snags during logging operations reduces preferred nesting and foraging structures (Shuford and Gardali, 2008). Vaux's swifts are

associated with old-growth or mature coniferous forests, particularly in areas with large, hollow trees. They prefer snags or dead trees with cavities for nesting. They are colonial nesters which can expose them to large scale nest failure should a nest site be damaged of abandoned.

The project would not remove late successional forests; however, a few larger conifer trees are present in the project area. Most of the vegetation that would be removed consists of commercially harvested timber stands planted within the last 30 years, recently harvested areas, or early seral conifer woodlands. Large areas of recently planted conifers are located north of the PG&E transmission line ROW. The removal of these types of vegetation are not likely to result in adverse impacts to the preferred habitat used by Lewis's woodpeckers, Vaux's swift, or olive-sided flycatcher. Nonetheless, the loss or fragmentation of suitable habitat or introduction of invasive weeds could result in modifications to established breeding territories.

Yellow warbler and yellow-breasted chat are typically associated with riparian habitats which are utilized for breeding, nesting, and foraging. Yellow-breasted chat prefer early successional riparian habitat with a well-developed shrub layer while yellow warbler is most frequently found near water in riparian habitats or in coniferous forests or shrubby habitats near water (Shuford and Gardali, 2008b). Project activities would result in impacts of up to a maximum of approximately 9.9 acres of riparian woodlands and wetlands habitat. Road improvements may require the replacement or installation of culverts or other crossings to support the delivery of large pieces of equipment that are located within habitats utilized by yellow-breasted chat and yellow warbler.

Any project related impact that results in the loss of nesting habitat, disturbance of breeding behavior, destruction of nests or eggs, exposure to herbicides or other hazardous materials, and mortality or injury to individual birds would be considered a significant impact under CEQA.

Any project related activities that result in the loss or abandonment of an active nest would be considered significant. To reduce impacts to nesting birds Staff recommends **BIO-23** (Nesting Bird Avoidance and Minimization Measures). This measure was proposed for common birds and would include the default non-disturbance buffers for any sensitive avian species that could nest in the project area. With the exception for raptors, most sensitive birds would require a 300-foot non disturbance buffer until the approved avian biologist evaluates if a small or larger buffer is warranted based on the activity and location of the nest. A reduction of any nest buffer for sensitive birds would require notification to the CEC within 24 hours.

Staff also recommends **BIO-1** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction).

Exposure to Herbicides and Hazardous Materials. Impacts to these sensitive avian species from exposure to herbicides or hazardous materials is largely the same as described for common birds. However, herbicide use in habitats that potentially support yellow-breasted chat and yellow warbler would be limited to target vegetation by direct application methods only and protected through the implementation of avoidance buffers for aquatic resources. Direct exposure to yellow-breasted chat or yellow warbler individuals or nests would not be expected. Ancillary exposure could occur if improper use, accidental spill, or drift results in the inadvertent contamination of insects that comprise most of the these species' diets. This is unlikely to occur if pesticides or herbicides are applied correctly and in accordance with regulatory guidelines. To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected.

Willow Flycatcher

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Willow flycatcher is a state endangered species. Protocol-level surveys conducted by the Applicant in 2018 did not detect nesting flycatchers. However, the project site does support suitable riparian habitat that could be used by this species. Based on the age of the existing data and that this species is known from the region, staff concludes that this species could nest or forage on or near the project site. In addition, willow flycatchers may fly over the project site during migration and may use available patches of riparian/wetland and meadow habitat as stopover habitat in spring and fall (FWPA, TN# 248288-6). If present, with the implementation of staffs recommended COCs impacts to this species would be reduced to less than significant levels under CEQA and would not result in Take or a violation of the California Endangered Species Act.

Direct impacts to willow flycatcher, if present, could include loss of habitat, destruction of active nests or eggs, disruption of breeding behavior, and exposure to herbicides and other hazardous materials. Indirect could include habitat fragmentation and edge effects, long-term alterations to hydrology, and degradation of habitat from invasive weeds.

Construction Disturbance and Nest Loss. Implementation of the project would remove approximately 10-acres of riparian vegetation. Some of this could support nesting flycatchers. Willow flycatchers prefer nesting in riparian habitats that are structurally heterogenous. Foliage height diversity and proximity to lentic water appear to also be important habitat selection factors for the species (Brodhead, 2005). Most of

vegetation removal activities would occur in densely forested upland habitats that do not support suitable riparian breeding habitat for willow flycatcher. The 2019 Willow Flycatcher Habitat Assessment (FWPA, TN 248306) completed by the applicant indicated that approximately 6.0 acres of suitable habitat were identified during the 2018 survey effort, and approximately 5.6 acres during the 2019 update. No detections of willow flycatchers were recorded during those surveys. It should be noted that surveys were only conducted within 300-feet of proposed developed areas which may have missed birds in adjacent areas.

Vegetation clearing or noise from equipment could result in the loss of active nests, or the displacement of nesting birds should they occur. In addition, road improvement activities would occur along new and existing access roads. Some of these activities could occur within suitable riparian breeding habitat for willow flycatcher. However, these activities would be designed to minimize vegetation and soil disturbance to the extent feasible.

Willow flycatcher primarily build nests on low shrubs and bushes often near the edge of willow thickets along streams in broad valleys, canyon bottoms, mountainside seeps, and at the margins of lakes and pools (Sedgewick, 2000; Gaines, 2005). Many riparian birds, including willow flycatcher, are adversely affected by noise and human disturbance (See Impacts to Common Birds for a detailed discussion of Noise impacts). Construction activities would include the use of heavy equipment, cranes, bull dozers, logging equipment, and powered hand tools that generate increased levels of noise when in use. Road improvement activities or the construction of new roads or turbine pads could result in excess levels of fugitive dust. Although any increase in human presence, noise, or fugitive dust would be localized and temporary, they could result in disruptions of breeding behavior and subsequent abandonment of flycatcher breeding territories, if present within or near work areas.

Direct impacts would occur if willow flycatcher active nests or fertile eggs are destroyed during construction. Although most construction activities would be minimized in riparian areas that support suitable breeding habitat for the species, nests, or eggs, if present in could be accidentally destroyed during vegetation removal or road improvements without the implementation of COCs. Any activity that results in the destruction of willow flycatcher nests or eggs or affect breeding would be considered a significant impact and would be considered a violation of the CESA.

To reduce impacts to nesting willow flycatcher staff recommends **BIO-24** (Willow Flycatcher Avoidance and Minimization Measures). This measure requires the completion of protocol surveys for willow flycatchers within 500-feet of proposed disturbance in all suitable riparian vegetation. Survey areas will be proposed to CEC and CDFW staff prior to initiation of the surveys for verification and approval. Should a nest be found a 500-foot non disturbance buffer would be implemented around the nest. The nest would be monitored during construction activities to ensure no take occurs. This buffer may be reduced if there are site specific or topographical considerations that

warrant a reduction. However, as this is a State listed species a reduction would only be authorized if there is compelling evidence the reduction would not result in a take to the species or result in altered behavior to the bird.

Staff also recommends **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction). **BIO-8** would provide compensatory mitigation for any riparian habitat that is removed and restore and manage adjacent upland habitat along the shaded fuel breaks. Impacts from fugitive dust would be mitigated by implementation of **AQ-SC3,** which include paving the main access roads through the facility and delivery areas before construction begins or stabilizing them with soil binders. **AQ-SC4** would require a qualified dust monitor during dust producing activities and require remedial measures if fugitive dust exceeds authorized limits.

Habitat Fragmentation, Introduction of Weeds, and Exposure to Herbicides and Hazardous Materials. Direct impacts could occur if willow flycatcher or occupied habitat is exposed to herbicides or other hazardous materials due to offsite drift, accidental spill, or vehicle and equipment leaks. Herbicides and other hazardous materials used during construction activities could potentially affect willow flycatcher through direct toxicity or influences on their insect food base. However, the Applicant would only use herbicides that have been approved by the CEC based on evaluations of toxicity, solubility, soil adsorption potential, and persistence in water and soil. In addition, only employees or contractors with required applicator licenses/certificates would be utilized.

The fragmentation of riparian habitat and subsequent edge effects can lead to heightened risks to willow flycatchers. Eggs and young are safest when nests are constructed within large tracts of dense contiguous habitat whereas those that occur within narrow and linear riparian habitats are increasingly vulnerable to nest parasitism by brown-headed cowbird and predation of eggs and young by a variety of predators. These risks increase with decreasing distances from thicket edges (Whitfield, 1990). However, clearing upland vegetation is not expected to result in adverse effects from habitat fragmentation. Willow flycatchers migrate through a variety of habitats between southern winter and northern riparian breeding grounds. However, habitat selection becomes more important during the breeding season. Continuous riparian corridors that provide movement between breeding patches and adequate avenues for dispersal are ideal. Construction activities would minimize vegetation removal within riparian areas and most of the vegetation would remain intact. Therefore, isolated patches of habitat that create barriers for juvenile dispersal would not be established. In addition, the area is currently subject to logging and supports a patchwork of recently logged areas, early seral stands of vegetation, and mature tress proposed for logging.

To reduce potential exposure to hazardous materials and limit sources of ignition during construction (discussed previously for vegetation communities) staff has incorporated

these measures into proposed **COCs** including **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1** which includes spill prevention and hazardous materials procedures, a Fire Prevention Plan (FPP), a fuel break management plan, and construction worker safety programs to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS. Implementation of these measures would reduce impacts to less than significant.

Bald and Golden Eagle

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Bald and golden eagles are present in the region and are known to overfly the project site. Nesting habitat is limited for both species but is present to some degree. These species have not been detected nesting on the project site however the surveys are old. It is possible these species could nest on or near the project site. The project is not expected to result in loss of important foraging habitat for either species. Bald eagles typically nest in close association with large rivers and lakes while golden eagles typically prefer more open habitat for hunting. With the implementation of staffs recommended COC impacts to bald and golden eagle would be reduced to a less than significant level. Staffs proposed conditions include educating workers, safely using herbicides, conducting pre-construction surveys for bald and golden eagles, and providing non-disturbance buffers should they be detected.

Background and Analysis. The Applicant conducted aerial nest surveys for bald and golden eagles in 2017. Eleven occupied bald eagle nests were detected within 10 miles of the project. Most of these nests were located along or near the Pit River, approximately 4 to 8 miles north from the project boundary (FWPA, TN 248288-6). The nearest bald eagle nest was found on Lake Margaret, a small reservoir 2.9 miles east of the project site boundary (ibid). Over 20 bald eagles were recorded in the applicant's avian use surveys (FWPA, TN 248288-6).

There are multiple CNDDB and eBird records for bald eagles within 5 miles of project area and numerous CNDDB, eBird, and iNaturalist records of bald eagles within the surrounding area. This species should be considered present although nesting habitat is likely limited in the project area. Bald eagles are expected to overfly the project area.

The bald eagle is a state endangered and fully protected species. Golden eagle is a state fully protected species. Bald and golden eagles also receive federal protections under the BGEPA. The project must maintain compliance with the BGEPA and will include measures designed to minimize impacts to bald and golden eagles where possible. Under the BGEPA, nest abandonment or decreased eagle reproductive success caused by substantial interference with normal breeding, feeding, or sheltering behavior, would constitute "take" and are prohibited by federal and state law without prior authorizations or permits from USFWS and through the CEC's project certification.

Construction of the project has the potential to result in direct and indirect impacts to bald and golden eagle should they nest within two miles of disturbance areas. Direct impacts to bald and golden eagle could include the loss of suitable habitat, disturbance of breeding behavior, destruction of active nests or eggs, nest abandonment, and exposure to herbicides and other hazardous materials. Indirect impacts could include long-term habitat type conversion and edge effects.

Construction Disturbance and Nest Loss. Construction activities including initial vegetation removal, grading, blasting, and erection of the WTGs have the potential to disrupt bald and golden eagle breeding should an active nest occur within two miles of disturbance areas. Three golden eagles were observed by the Applicant during two years of aerial nest searches and over 914 hours of point counts. This data suggests that golden eagle use of the project site is relatively low. If golden eagles where nesting near the site it is likely that the birds would have been more routinely detected during point counts and general raptor surveys. Nest sites for golden eagle were not detected within 2 miles of proposed disturbance areas. However, the USFWS noted in their comment letter on the Shasta County EIR that aerial surveys may miss golden eagle nests when placed in large trees. Suitable breeding habitat for golden eagle occurs along scattered ridgelines and cliff faces, mature trees within open forests and woodlands, and transmission line infrastructure throughout the project area.

Based on the age of the surveys it is not possible to ascertain if golden eagles are currently nesting in the project area. Nesting areas, if present, would likely be associated with the large rivers and lake edges in the region such as the Pit River for bald eagles, and in areas closer to open foraging habitat for golden eagles. In addition, the Applicant is currently conducting (i.e., 2024) updated surveys for bald and golden eagles and this information will be provided to the CEC as it is obtained. In addition, most of the project site is dominated by relatively young stands of timber which do not support high quality nesting habitat for either species. Grier and Guinn (2003) determined that within the broad range of basic requirements (proximity to water bodies, substantial trees for nest support, and an adequate prey base), bald eagle habitat is highly variable and not specialized. Typically, bald eagles' nest near coastlines, rivers, or large lakes or streams that provide an adequate food base. In forested areas, they generally select the tallest trees with limbs strong enough to support the nest; however, large continuous forests are not obligatory habitats for nesting bald eagles. Rather, single variables, such as tree diameter or distance to water, have provided valid differences between nest site and random site selection (Grier and Guinn, 2003). If eagles lose a nest tree, they generally rebuild close by (Broley, 1947). Nest sites usually include at least one perch with a clear view of the water where the eagles usually forage. In California, resident bald eagle pairs remain during the winter, typically in the vicinity of their nesting areas, except when winter conditions are too severe, and they must move to lower elevations. Because most of the project site is located well away from large rivers and lakes it is likely that nesting for bald eagles occurs in adjacent areas that support large snags that are near surface water.

Golden eagle prefers to construct nests on platforms on steep cliffs or in large trees or man-made structures, such as transmission line towers in a variety of open habitats including forests, canyons, woodlands, shrub lands, and grasslands. This species requires open terrain provided in habitats such as grasslands and early successional stages of shrubland and forests for hunting. Most golden eagles in California are resident and, like bald eagles, may move to lower elevations during severe winter conditions. It is possible that golden eagles could nest on some of the steep cliff faces that occur in or adjacent to the proposed project area, but nests were not detected during previous surveys conducted by the Applicant. However, this species could forage within recently logged areas and the existing PG&E transmission line corridor.

If present, construction of the project could result in direct and indirect impacts to these species. Bald and golden eagles are particularly sensitive to interactions with humans. Human disturbance can negatively affect breeding eagles by causing them to flush from nests and perches, which can reduce breeding success and parental care or lead to abandonment of occupied nesting sites.

Grier and Guinn (2003) determined that there was not a clear relationship between bald eagle nest sites and human presence, although human presence may affect bald eagles at greater distances than 100 meters. One study found seventy-five percent of all flight and alert call responses occurred when human activity (e.g., vehicles, noise, and pedestrian disturbance) was within 200 meters and 500 meters, respectively (Grubb et al., 1992). Disruption of roosting and foraging areas can also negatively affect bald eagles. According to USFWS (2007), human activity may agitate or bother roosting or foraging bald eagles to the degree that it interferes with breeding, feeding, or sheltering behavior, causing injury, death, or nest abandonment. Nesting parents may inadequately feed their young if the adults are prevented or discouraged from feeding at preferred sites. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if other undisturbed and productive sites are unavailable. Disruptive activities in the flight path between nesting and roosting sites and nearby foraging areas can also interfere with feeding.

Human intrusion near golden eagle nest sites has also been shown to lead to nest abandonment, high nestling mortality when young go unattended due to altered behaviors by the parent birds, premature fledging, and ejection of eggs or young from the nest (Pagel et al., 2010). Palmer (1988) identified human disturbance as being responsible for 85 percent of golden eagle nesting failures in Wyoming, Colorado, and New Mexico. Eagles have also shown demonstrable responses to low-level aircraft, such as helicopter that would be used during Component 1 activities, particularly during the breeding season (Grubb and Bowerman, 1997). Low-level overflights have caused bald eagles to attack or avoid the aircraft, or depart the area entirely, which are energetically costly and behaviorally disruptive. Grubb and Bowerman (1997) cite an example in Arizona where the death of a nestling was attributed to frequent helicopter flights of less than 90 feet above a cliff nest. The disturbance kept the adults away for long periods and significantly reduced prey deliveries. Any impacts to bald or golden

eagles that result in nest disturbance or abandonment would be considered a significant impact under CEQA and would conflict with the bald and golden eagle act and CDFW regulations regarding fully protected species.

To reduce impacts to nesting bald and golden eagles staff recommends **BIO-25** (Bald and Golden Eagle Avoidance and Minimization Measures). This measure requires the completion of protocol surveys for each species within two miles of all proposed disturbance areas. In addition, this measure would require the implementation of ground-based surveys where legal access can be obtained to search for golden eagle nests that may be hidden from aerial observation. Survey areas will be proposed to CEC, CDFW, and USFWS staff prior to initiation of the surveys for verification and approval. Should a nest be found during construction a one mile non disturbance buffer would be implemented around the nest. The nest would be monitored during construction activities to ensure no take occurs. This buffer may be reduced if there are site specific or topographical considerations that warrant a reduction. For golden eagles a reduction would only be authorized if there were compelling evidence the reduction would not result in a take to the species or result in altered behavior to the bird.

Staff also recommends **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), and **BIO-11** (Conduct Biological Monitoring During Construction). **NOISE-6** limits heavy equipment operation and noisy construction work relating to any project features, including linear facilities, helicopter operation, and rock blasting to a period of Monday through Saturday between the hours of 7:00 A.M. to 7:00 P.M which would reduce noise related impacts during nighttime hours. Specific conditions related to blasting would include seasonal timing, pre-construction surveys, scare charges or warning horns, and monitoring. Blasting would not be authorized during the eagle breeding season if eagles are located within the non-disturbance buffers.

Habitat Fragmentation and or Degradation. Construction of the project would permanently remove approximately over 500 acres of forested vegetation in the project site. The loss of forested habitat is not expected to result in adverse impacts to bald or golden eagles foraging habitat and would represent a negligible reduction compared to similar habitats that are abundant throughout the region. Typically, bald eagles remain close to large areas of open water in the winter for prey access but may range farther from these areas provided there are large streams with adequate prey base which are extremely limited in the project area. There is limited foraging habitat present for bald eagles however they may periodically forage at some of the larger creeks that cross the project site. The conversion of forested habitat to low-growing vegetation communities surrounding the WTGs and the shaded fuel breaks would not adversely affect these species. As forested areas are removed this may create additional foraging opportunities for golden eagles, which could lead to mortality from collisions with the WTGs and met towers during operation of the project (Operational impacts are discussed below).

The removal of vegetation would increase habitat fragmentation in the region although the project area is currently fragmented from ongoing logging operations. In addition, while forest edges can have detrimental effects on a variety of species, others, such as bald eagle, are not as severely affected and edge habitats may even provide some benefits. In a study from south-coastal British Columbia, Goulet and Bird (2021) found that bald eagle nests close to patch edges in areas with greater human land use had higher reproductive rates than more isolated or rural nests. Another study from North Carolina determined that bald eagles used night roosting areas that contained larger trees, were less dense, had less crown cover, and were closer to forest edges than randomly selected sites. Forest edges can also provide some benefits to golden eagle. Juvenile golden eagles have demonstrated a preference for edges between clearcuts and forests (Sandgren et al. 2013). This is likely due to golden eagle hunting grounds' close connection to prey availability. During late summer and early autumn, when the juveniles are located close to their home range, clearcut and forest edges are productive and provide foraging opportunities. However, increasing preferred habitat for golden or bald eagles could lead to mortality from collisions with the WTGs (Operational impacts are discussed below).

Bald and golden eagle foraging habitat could also be indirectly impacted through the degradation of habitat from the introduction or spread of invasive weed species or changes in prey abundance or species assemblages. Habitat loss could also occur if wildfires are inadvertently initiated during construction or vegetation clearing activities. The loss of or degradation of habitat for these species would be considered significant under CEQA.

To reduce impacts from habitat loss, degradation from weeds, or accidental wildfires staff recommends **BIO-5** (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention.

Exposure to Herbicides and Hazardous Materials. The risk of exposure to bald eagles is extremely low as there is limited foraging habitat on the project area for this species. There is a slightly higher risk to golden eagles should they prey on small mammals that occur in more open areas or along the PG&E transmission line right of way. Although the risk is low, each of these species could also be exposed to herbicides should they forage in the project area. Even when bald or golden eagles do not come

into direct contact with herbicides or other hazardous materials, they can be affected via food-chain concentrations, particularly when these materials are widely applied across a landscape. This can occur when fish, rabbits, or other small herbivores consume material exposed to contaminants or contaminant residue. The contaminant accumulates in the tissue of the predatory animal through bioaccumulation as exposed prey items are consumed. Even at non-fatal levels, the bioaccumulation of some contaminants can result in a reduction in the amount of food consumed, loss of weight, changes in physical activity, and a decrease in the production, fertility, and hatchability of eggs (Cox, 1991).

To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-3** (Weed Control Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected. Implementation of these measures would reduce impacts to a less than significant level.

California Condors

Construction

Less Than Significant Impact.

Basis for Conclusion. California condors are not currently known from the project area. Nesting habitat for this species is limited and the closest known occurrences occur as an experimental population in the Redwood National Forest. Implementation of the project is not expected to result in disturbance to nesting birds or result in the loss of nesting or foraging habitat for this species. In the unlikely event this species occurs during construction staffs proposed COCs for other species would ensure the protection of foraging or visiting birds. These COCs include the collection of microtrash, educating workers, and providing non-disturbance buffers should unexpected species be detected in the project area during construction. Although not required the implementation of staffs recommended COCs would reduce impacts to this species to less than significant levels under CEQA

Background and Analysis. The California condor is federally and state-listed endangered and is Fully Protected in California. On March 23, 2021 the USFWS and Yurok Tribe announced the reintroduction of condors to Yurok Ancestral Territory and the Redwood National Forest (northern portion of species historic range). This effort was conducted under the Northern California Condor Restoration Program and this condor population is considered a nonessential, experimental population under the ESA. Condors were subsequently released and in 2023 several condors received treatment for lead poisoning after feeding on a poacher-killed elk within the Redwood National Park.

Direct Mortality or Displacement. Condors are not known to nest near the project site, and it is unlikely they would do so given the habitat conditions that occur in the project area. Construction of the project would not result in direct or indirect impacts nesting condors. Nonetheless, given the current population trends and efforts to re-introduce this species to areas of their formal range and that condors are known to travel over 50 miles during foraging events, condors may visit the project area at least on occasion over the course of the project lifespan. Should they occur impacts to nesting condors would be avoided through the implementation of nesting bird measures for other species such as golden and bald eagle. **BIO-25** (Bald and Golden Eagle Avoidance and Minimization Measures) requires that surveys are conducted within two miles of all proposed disturbance areas. If present as a local nester it is likely that these surveys would detect both over flying birds and likely nest sites. In addition, **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), and **BIO-11** (Conduct Biological Monitoring During Construction) would educate workers regarding this and other species, includes measures for cleaning up micro-trash and will include specific language on the procedures required should a new or unexpected species be detected in the project area during construction or operation of the project. With the implementation of these COCs impacts to California condor are not expected to occur.

Habitat Loss and or Fragmentation. Construction of the project is not expected to result in the loss of important foraging habitat for California condors. The removal of large and dense timber lands and the management of shaded fuel breaks could increase foraging opportunities for this species in the future. Potential interactions with the WTGs and other project components are discussed under operational impacts.

Exposure to Herbicides and Hazardous Materials. Condors are curious species which will land and investigate trash piles and other construction related debris. The greatest risk for condors is associated with the potential for ingestion of objects such as microtrash (i.e. broken glass, hardware, plastic waste, bottle caps, small pieces of metal) or substances such as ethylene glycol antifreeze. Adults can bring microtrash back to nest sites where young birds can be injured or killed when they ingest the material. California condors are known to forage on a variety of carrion including small mammals such as jack rabbits (Collins, 2000) and may be attracted to small animals killed during construction activities on the proposed haul routes. The likelihood of this occurring during construction is extremely low and existing COCs would ensure this impact is avoided should condors occur at some point during construction. Although not required **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), and **BIO-11** (Conduct Biological Monitoring During Construction) includes measures for cleaning up micro-trash and will include specific language on the procedures required should a new or unexpected species be detected in the project area during construction or operation of the project.

To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from

exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. While California condors are not currently present in the project area, they could become periodic visitors as their population increases. Although not required the implementation of staffs recommended COCs would avoid impacts to this species.

Northern and California Spotted Owl

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. For management purposes the USFWS considers Highway 299 to be the boundary between the Northern and California spotted owl. Defining species boundaries is important for effective management and conservation. By delineating species boundaries, managers can develop targeted conservation strategies for each species, considering their ecological requirements, threats, and other conservation priorities. Therefore, all owls south of the 299 are considered California spotted owls and all owls north of the 299 as Northern spotted owls. See FWPA, TN 249927 (Technical Memorandum Regarding the Boundary Between Northern and California Spotted Owls) for further information describing the history and decisions that set the range boundaries for these species. In conclusion, while Northern spotted owls may be present to some degree, for regulatory purposes they have been excluded from further analysis in this document. However, because of their similar life histories any mitigation measures proposed for California spotted owls would also protect Northern spotted owls should they occur.

California spotted owls have not been detected nesting on the project site but are known from adjacent locations. They likely forage to some degree in the project area. With the implementation of staffs recommended COC impacts to California spotted owls would be reduced to less than significant levels under CEQA. Staffs proposed conditions include educating workers, safely using herbicides, conducting pre-construction surveys for spotted owls, and providing non-disturbance buffers should they be detected.

Background and Analysis. Northern spotted owl is listed as a federal and state threatened species. The California spotted owl is a California SSC and is being considered as a candidate for federal listing. The project is located where the ranges of these two species converge. It is possible that both species occur in the dense woodlands surrounding the project area however it is not possible to effectively determine the birds to subspecies where their ranges overlap. Northern and California spotted owls share morphological traits, such as physical appearance and anatomical features, which makes it difficult to differentiate between species in the field. It is also likely that birds in this area are interbreeding which can further complicate species identification.

The Applicant conducted a variety of habitat assessments and surveys for California spotted owl. They concluded that most of the project area contains limited habitat due to the Fountain Fire and because the site is activity managed for timber production. Suitable habitat for this species is present in older forested areas along the southern and eastern portions of the project area and in adjacent natural and managed timber lands. Spotted owl surveys conducted by the Applicant in 2021 to support previous planning efforts did not detect spotted owl activity in the project area, but owls were documented nesting at the historical activity center (SHA0046) which is located on National Forest Service lands east of the project (see Figure 1 FWPA, TN253168), but no CSO activity within the project. At the request of staff additional surveys for this species were conducted in 2023. California spotted owls were detected near the southern border of the project near the LNF during focused surveys conducted by the Applicant in 2023 (FWPA, TN 253168). No active nest sites or activity centers were detected within 0.25 miles of any proposed disturbance areas.

Direct and Indirect Impacts. Direct impacts to California spotted owl, if present, could include loss of habitat, destruction of active nests or eggs, disruption of breeding behavior, and exposure to herbicides and other hazardous materials. Indirect could include habitat fragmentation and edge effects, increased windthrow, long-term alterations to hydrology, and degradation of habitat from invasive weeds.

Construction Disturbance and Nest Loss. Based on the results of these surveys, the age of most of the conifer stands, the fragmented nature of the remaining large timber stands, and ongoing timber harvesting the likelihood of California spotted owl nesting within the project area is low but cannot be excluded. Large stand altering wildfires to be a common occurrence across many areas that support spotted owl habitat and this species may elect to nest in more marginal habitat types should primary nesting habitat be lost. Construction activities including initial vegetation removal, grading, blasting, and erection of the WTGs have the potential to disrupt spotted breeding should an active nest occur within 0.25 miles of disturbance areas.

If present, active nests or eggs could be destroyed during tree felling or other activities. Use of powered hand tools, heavy equipment in the vicinity of occupied spotted owl habitat could introduce elevated levels of noise. These activities could disrupt breeding behavior and ultimately lead to avoidance of breeding altogether or the failure of an already established nest. Delaney et al. (1999) studied the effects of helicopter noise on Mexican spotted owls in New Mexico and found the flushes (flight responses) increased with decreasing distance and increasing sound level. They also determined that owls flushed more in response to chain saw noise than helicopter noise. Owl flushing rates were the same in the breeding season and the non-breeding season, although owls did not flush when chicks were in the nest. Finally, the authors found no significant difference in reproductive success between owls exposed to helicopter and chainsaw noise and those that were not exposed to these noise sources, but the population sizes were small enough that the authors may not have been able to detect an effect on reproduction. However, flushed owls are likely more prone to predation, stress, and

repeated activity during the breeding season. Another study by Tempel and Gutierrez (2003) used fecal corticosterone (a stress hormone) as a measure of physiological stress response in California spotted owls exposed to chainsaw noise. They found no detectable increase in fecal corticosterone levels in owls exposed to a chainsaw operating 100 meters away. While the studies cited above suggest that spotted owls can tolerate some degree of anthropogenic noise disturbance, impacts associated with construction that cause the destruction of nests or eggs or disrupt breeding behavior could occur without precautions.

Any impacts to California spotted owl that result in nest disturbance or abandonment would be considered a significant impact under CEQA. To reduce impacts to nesting California spotted owl staff recommends **BIO-26** (California Spotted Owl Avoidance and Minimization Measures). This measure requires the completion of protocol surveys for spotted owls within 0.25-miles of suitable habitat or the implementation of Limiting Operating Periods to avoid the breeding season for this species. If detected the Applicant would implement a 0.25-mile non-disturbance buffer and limits to the amount of timber removed may be required. This buffer may be reduced if there are site specific or topographical considerations that warrant a reduction. Survey areas will be proposed to CEC, CDFW, and USFWS staff prior to initiation of the surveys each year depending on the location of the disturbance in proximity to suitable habitat for verification and approval. Additional buffers may be warranted in the event of blasting.

Staff also recommends **BIO-1** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-11** (Conduct Biological Monitoring During Construction) and **NOISE-6** which limits heavy equipment operation and noisy construction work relating to any project features, including linear facilities, helicopter operation, and rock blasting to a period of Monday through Saturday between the hours of 7:00 A.M. to 7:00 P.M Specific conditions related to blasting would include seasonal timing, pre-construction surveys, scare charges or warning horns, and monitoring. Blasting would not be authorized during the breeding season if spotted owls are located within the non-disturbance buffers.

Habitat Loss and Fragmentation. Spotted owls generally rely on mature and old-growth forests because these habitats contain the structures and characteristics required for nesting, roosting, dispersal, and foraging. Although spotted owls select habitat at multiple spatial and temporal scales, there is less flexibility in nesting and roosting habitat requirements. Generally, older forests with a higher degree of complexity and a high canopy closure are thought to be preferred for nesting and roosting activities. Like most owl species, California spotted owls' nest in trees, typically utilizing large cavities in old trees or natural platforms created by breaks in the treetops or other natural deformities large enough to provide a stable nest site. Most of the habitat in the project area consists or a patch work of timber plots, some of which have been recently harvested. Most of the habitat in the project area generally consists of young trees (i.e., approximately 30 years old) which does not support the preferred

habitat for this species. The loss of these timber stands would not result in significant loss of foraging habitat.

Foraging habitat is the most variable of all habitats used by territorial spotted owls (USFWS, 2017). In general, studies suggest that foraging habitat is more open (less vegetation biomass) than nesting habitat, is often located close to nest sites, is associated with large trees and snags, and is infused with other vegetation types. In a study located in the Plumas National Forest during the 2015-2017 breeding seasons it was found that California spotted owls selected for foraging habitat with high canopy cover (>70%) and high to medium diameter trees (>25 cm DBH). However, Irwin et al (2007) found California spotted owls use forested areas with moderate density, commonly by small watercourse, adjacent to nesting sites during nocturnal foraging. These areas most likely have a higher density of prey. Riparian zones, in both mixed conifer and hardwood forests, seem to be important in foraging areas since woodrats can be an important food source (Ibid). Foraging habitat can include young forests with high heterogeneity and a hardwood component due to it being beneficial woodrat habitat. Woodrats were not as commonly caught by owls in medium and high canopy cover habitats which suggest that other prey items are consumed and may lead to less reproductive success (Zulla et al, 2022).

Woodrats are the primary prey in the southern portion of the species' range, including northern California (Lesmeister et al., 2018). Recent landscape-level analyses in portions of southwest Oregon and California Klamath Province suggest that a mosaic of late successional habitat interspersed with other seral conditions may benefit northern spotted owl more than large, homogeneous expanses of older forests in areas where woodrats are a major component of spotted owl diets (Meyer et al., 1998; Franklin et al., 2000; Zabel et al., 2003). This is also likely true to California spotted owls as well. Woodrats occur in fairly open forests and have the greatest densities in young stands, along edges, or in brushy areas (Carey et al., 1992; Zabel et al., 1995). Spotted owls used forest edges to a greater degree when forage consisted primarily of woodrats (Diller et al., 2012).

Dispersal habitat is essential to maintaining stable populations by filling territorial vacancies when resident spotted owls die or leave their territories, and to provide adequate gene flow across the range of the species (Lesmeister et al., 2018). Although spotted owls can disperse through highly fragmented forested areas, the stand-level and landscape-level attributes of forests needed to facilitate successful dispersal have not been thoroughly evaluated or described (USFWS, 2011). Thomas et al. (1990) defined forest suitable for dispersal for northern spotted owls as having trees with a greater or equal to diameter at breast height (dbh) of 11 inches at 40 percent or greater canopy cover occurring on 50 percent or greater percent of a 36-square-mile township; this definition became known as the 50/11/40 rule. However, this hypothesis was not based on juvenile resource selection data and remains largely untested (Lesmeister et al., 2018). Another study empirically analyzed forest-type selection during juvenile dispersal (Sovern et al., 2015). This study found that juveniles strongly

select for old forest with closed canopy (greater than 70 percent cover) and large-diameter trees (greater than 20 inches dbh), which are similar forest conditions selected by adult spotted owls for nesting and roosting. At a minimum, dispersal habitat consists of stands with adequate tree size and canopy closure to provide protection from avian predators and at least minimal foraging opportunities. There is little evidence that small openings in forest habitat influence the dispersal of spotted owls, but large, non-forested valleys are apparent barriers to both natal and breeding dispersal (Forsman et al., 2002). However, survival decreases dramatically when the amount of non-habitat (non-forest areas, sapling stands, etc.) exceeds approximately 50 percent of the home range (Dugger et al., 2005).

Schilling et al. (2013) found that spotted owls had decreased survival and increased home-range size with increased forest fragmentation in southwestern Oregon. In Washington, territory-level extinction rates decreased with increased amount of late-seral edge, and colonization decreased with more late-seral patches within a territory (Sovern et al., 2014). Comfort et al. (2016) found that spotted owls that were radio-marked in southern Oregon were negatively associated with hard edges (high contrast in forest structure and height) at a fine scale but showed a lack of negative response to hard edges at broader scales (territory or home-range scales). It is also important to consider these factors when assessing the influence of forest edges on foraging and space used by spotted owls (Lesmeister et al., 2018). At the territory scale, heterogeneity can contribute to accessibility to different forest types during foraging events. As older forests become reduced to smaller and more isolated patches, the ability of spotted owls to successfully disperse and establish territories is also reduced (Lamberson et al., 1992). The survival of dispersing juvenile owls significantly diminishes when the landscapes they utilize are fragmented (Thomas et al., 1990; Lamberson et al., 1992). High dispersal mortality, coupled with low reproductive rates, make the species particularly susceptible to changes in habitat connectivity due to fragmentation (McKelvey et al., 1993). Regardless of spatial scale, spotted owls appear to be positively associated with softer, more diffuse edge types created by disturbances such as low- and mixed-severity fire (Comfort et al., 2016).

The removal of vegetation is not expected to result in adverse impacts by increasing windthrow. Windthrow occurs when the force of wind exceeds a tree's stem or anchor strength and results in the breaking or blowing down of trees. Topographic conditions and stand management activities influence windthrow potential because wind accelerates as it moves over and around landscape obstacles. Depending on landscape position, thinned stands or stands adjacent to clearcut harvests may experience increased susceptibility to windthrow (USFS, 2023; Thomas et al., 1990). Windthrow is a part of the natural disturbance throughout much of the northern spotted owl range and does not pose a significant risk to the species (Courtney et al., 2004). It is likely that this is also common for areas supporting California spotted owls where they use conifer woodlands.

In some circumstances, windthrow can be beneficial as it aids in developing structural elements needed for spotted owl habitat, such as snags and broken top trees (Franklin and Gutierrez, 2002). However, significant windthrow events can result in damage ranging from slight to almost complete removal of trees in some areas. However, most of the trees that would be removed are relatively young and there are few large stands of mature late seral stages of conifer woodland that are more closely associated with this species. Based on this it is likely that any potential increase in windthrow would result in negligible, if any, affects to California spotted owl habitat in the project area.

In conclusion, California spotted owls do not appear to use most of the project site based on the current habitat conditions (i.e., relatively young stands of timber) for nesting bur likely forage along the margins of the site. The removal of these areas and more forested habitat would result in more open areas however these would occur in an area already subject to ongoing timber harvest plans that is highly fragmented in the southern portion of the project area. The loss of these areas is not expected to result in the significant loss of foraging habitat or result in increased habitat fragmentation for this species compared to baseline conditions.

To reduce impacts from habitat loss, degradation from weeds, or accidental wildfires staff recommends BIO-5 (WEAP), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention.

Increased interactions with barred owls great horned owls. The removal of timber stands could increase edge areas which could lead to increases in the number of bared owls in the region. Barred owls are known to occur in Shasta County and have been recorded throughout the STNF and LNF and in proximity to most of the project area. Research has demonstrated the detrimental effects of barred owls on northern spotted owl populations at a range-wide scale, which include altered behavior (e.g., reduced calling of spotted owls), displacement from preferred high-quality habitat, decreased survival and occupancy rates, and increased extinction rates. It is likely that as this species range expand, they will pose an increased risk to California spotted owls. Great horned owls are also able to effectively utilize edge areas and could increase in abundance in newly cleared areas. However, construction of the project would not result in additional fragmented habitat or increase edge effects compared to current timber practices in the immediate area. While smaller trees would be removed in most

of the site these areas do not currently support spotted owls. Any contribution to risks associated with barred owls or great horned owls would be negligible.

Exposure to herbicides or other hazardous materials. There is some risk that spotted owls could be indirectly exposed to herbicides or other hazardous materials. Although spotted owls are unlikely to come into direct contact with herbicides or other hazardous materials, they could be secondarily affected through consumption of contaminated prey. This can occur when small herbivores consume material exposed to contaminants or contaminant residue. The contaminant accumulates in the tissue of the predatory animal through bioaccumulation as exposed prey items are consumed. Woodrats, the primary prey source of spotted owls in the project area, have been shown to use harvested woodlands prepared mechanically if piles of woody debris are present, but do not use sites that have been treated with herbicides within the previous 5 years (O'Connell and Miller, 1994). The type of sites included in the study represent areas that were broadly treated with herbicides, which would not occur during the project.

The greatest risk of herbicide exposure is in the southern portions of the project area where spotted owls have been detected in adjacent habitat. However, the Applicant would use only those herbicides that have been approved by the CEC based on evaluations of toxicity, solubility, soil adsorption potential, and persistence in water and soil. Only employees or contractors with required applicator licenses/certificates would be utilized. In addition to herbicides, other hazardous materials, such as fuel, motor oil, and hydraulic fluid, would be used in vehicles and heavy equipment.

To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected. Implementation of these measures would reduce impacts to a less than significant level.

Great Gray Owl

Construction

Less Than Significant Impact.

Basis for Conclusion. Species not known to occur in the project area. Suitable old growth timber and associated proximities to adequate foraging habitat is not present. Staffs proposed mitigation measures for other avian species and owls would prevent disturbance to nesting birds if present.

Background and Analysis. The great gray owl is a state endangered species. The distribution of the species is extremely limited and there are no known records of this species occurring in the project region. In a study conducted by the Applicant they indicated that nearest known occupied territories are located approximately 85 miles away in Modoc County. In addition, although the project is within the historic range of the species the site lacks the typical habitat features required for this species. Great gray owl nesting habitat in California is most associated with dense forest stands adjacent to montane meadow foraging habitat. Suitable nesting habitat includes mature or old-growth conifer stands with greater than 50 percent canopy cover containing potential nest trees. Similarly, this species was not detected during surveys for other owls nor detected during surveys for northern goshawk, willow flycatcher, and general fixed point avian use surveys (FWPA, TN 248308-5).

Direct and indirect impacts to this species are not expected to occur during construction of the project. However, should they occur in surrounding areas or elect to nest in the project area prior to construction they would be protected by the implementation of mitigation measures for other native birds and owls.

Northern Goshawk

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Approximately six northern goshawks were observed during by the Applicant (Appendix C4 of FWPA, TN 248288-6) during fixed avian point counts and a series of protocol level surveys conducted at historic sites and across the broader project area. No nesting goshawks have been detected. Goshawks use a variety of forest types for nesting and foraging across their range. Because of their mobility and the wide array of forest types they use, it is difficult, if not impossible, to define discrete breeding populations (USFS, 2006). Based on the age of the surveys, while low, it is possible this species could nest on or near the project site. With the implementation of staffs recommended COC impacts to northern goshawk would be reduced to less than significant levels under CEQA. Staffs proposed conditions include educating workers, safely using herbicides, conducting pre-construction surveys for northern goshawk, and providing non-disturbance buffers should they be detected.

Background and Analysis. Northern goshawk is a CDFW SSC. This species has been observed during avian surveys conducted by the Applicant in 2017 and 2018 (Appendix C4 of FWPA, TN 248288-6). In addition, there are four historical four goshawk territories (i.e., territories 54, 50, 66, and Cow Creek) have been documented within the project area (see Figure 1 in FWPA, TN 248306-4 2018). Based on information provided by the Applicant territories 50, 66, and Cow Creek have been inactive since the mid 2000's and only territory 54 showed some activity (FWPA, TN 248306-4). This is consistent with information provided in the Cedar Boots timber harvest plan (THP) which was approved in, October 2017 and overlaps three of the goshawk occurrence

areas (50, 66, and Cow Creek). The THP further indicates that no goshawks were detected during planning for future timber harvesting in this area.

Protocol surveys for this species were conducted at the four historic nest sites in 2018. Two previously documented nest trees were located during field surveys associated with territories 50 and 54. One nest tree contained a nest that was occupied by a great horned owl and the other was a broken-top snag no longer capable of supporting a nest. No visual or auditory detections of goshawks were recorded, and no evidence of nesting goshawks was observed during the dawn acoustical surveys in those locations.

Goshawk surveys were conducted again in 2021. They included all potentially suitable nesting habitat (i.e., forest stands greater than 40 years of age) located within a 0.25-mi buffer of project infrastructure (e.g., roads, underground collection, turbines pads, etc.). No goshawks or nest sites were detected.

Based on the surveys the data suggests that the project area has a lower potential to support this species compared to adjacent forest land. However, the surveys are three years old and suitable habitat for this species does occur in other non-surveyed areas. It is possible this species occurs in or adjacent to the project area, particularly in areas supporting larger stands of timber adjacent to the LNF.

Goshawk typically use the densest stands of vegetation that are available given the capability of the forest type. Numerous studies and modeling efforts have found nest sites to be associated with similar factors, including but not limited to, proximity to water and patches of larger, denser trees (USDA, 2006). High canopy closure also appears to be an important habitat characteristic (Hayward and Escano, 1989). Foraging habitat typically includes forest floors, small woodland openings or edges, or large open areas (Wheeler et al., 2003).

Construction of the project has the potential to result in direct and indirect impacts to northern goshawks should they nest near disturbance areas. Direct impacts could include the loss of suitable habitat, disturbance of breeding behavior, destruction of active nests or eggs, nest abandonment, and exposure to herbicides and other hazardous materials. Indirect impacts could include long-term habitat type conversion and edge effects.

Construction Disturbance and Nest Loss. Construction activities including initial vegetation removal, grading, blasting, and erection of the WTGs have the potential to disrupt goshawk breeding should an active nest occur within 0.25-miles of disturbance areas. While actively logged areas may reduce the potential for this species to occur in some areas (i.e., recently logged or early successional stands) the USFWS previously reported that disturbance does not appear to be a significant factor effecting the long-term survival of any North American goshawk populations (USFWS, 1998). However, human disturbance such as timber harvesting near nests has been shown to cause nest failure, especially during incubation (Boal and Mannan, 1994). Logging activities, such as cutting, loading, and skidding within 50 to 100 meters of a nest can cause

abandonment even with nestlings up to 20 days old (USFWS, 1998). If nests are present, they may be subject to periods of elevated noise and human presence during project construction. Similarly large vehicles and equipment would be required to cross a wide variety of potential nesting habitat for a period of two years which could disrupt nesting for this species. Other disturbance related impacts such as blasting could disturb birds well away from the project area. Based on the age of the surveys it is not possible to ascertain if this species is currently nesting in the project area. The disturbance of breeding behavior or the destruction of nests or eggs would result in significant impacts under CEQA.

To reduce impacts to nesting northern goshawks staff recommends **BIO-27** (Northern Goshawk Avoidance and Minimization Measures). This measure requires the completion of protocol surveys within 0.25 miles of all proposed disturbance areas. I Survey areas will be proposed to CEC and CDFW staff prior to initiation of the surveys for verification and approval. Should a nest be found during construction a 0.25 mile non disturbance buffer would be implemented around the nest consistent with current CDFW guidelines for this species. The nest would be monitored during construction activities to ensure no take occurs. This buffer may be reduced if there are site specific or topographical considerations that warrant a reduction and if screening vegetation has been left in place surrounding the nest site. Screening vegetation could be removed after the completion of the nesting season and the young have fledged. A buffer reduction would only be authorized if there were compelling evidence the reduction would not result in a take to the species or result in altered behavior to the bird.

Staff also recommends **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-11** (Conduct Biological Monitoring During Construction) and **NOISE-6** which have been described previously.

Habitat Fragmentation and or Degradation. Construction of the project would permanently remove approximately 500 acres of forested vegetation in the project site. Construction of the project would remove high quality habitat that could be used by this species. However, due to different population responses that are expected in habitats of different quality, it is important to consider potential use of all possible habitats and not just high-quality habitat exclusively (USDA, 2006). As such, northern goshawk could occur in habitats of varying degrees of quality throughout the project area. In addition, northern goshawks are long-lived and exhibit high territory fidelity (Detrich and Woodbridge, 1994). The removal of vegetation and timber stands would alter foraging habitat in the project area. However, for northern goshawk, nesting sites, if present, would likely be associated with densely forested areas in proximity to permanent to semi-permanent aquatic features and open spaces for foraging. The reduction of vegetation would represent a negligible reduction compared to similar habitats that are abundant in adjacent areas and throughout the region. Northern goshawks also prefer habitat near openings and adjacent to adequate foraging grounds. Vegetation removal would occur where densely forested habitat would be permanently converted to low-growing vegetation communities such as shaded fuel breaks and the areas around the

WTGs. This would create new edge habitat potentially increasing foraging opportunities for northern goshawk should they nest in adjacent areas.

To reduce impacts from habitat loss, degradation from weeds, or accidental wildfires staff recommends **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **FOREST-1**, **FOREST-2**, **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction) and **HAZ-7** (Prepare a Fuel Breaks Plan). **BIO-5** would require all construction personnel and project staff to undergo environmental awareness training prior to conducting work on the project. **BIO-7** identifies a series of standard environmental measures that must be complied with during construction. The condition includes limiting work to daylight hours, inspecting pipes and excavations, conducting pre-construction surveys, monitoring and many other protective measures. **BIO-8** requires the restoration of temporary disturbed areas with low growing native species including annual wildflowers to promote a transition along the shaded fuel breaks and temporarily disturbed areas. The fuel breaks would be managed through **HAZ-7** (Fuel Breaks Plan (FBP)) with input from a wildland fire fuels specialist or local forester. This condition would augment **BIO-8** to balance restoration and fire prevention.

Exposure to Herbicides and Hazardous Materials. It is highly unlikely that northern goshawks would be directly exposed to herbicides or other hazardous materials during construction. However, prey items, including small rodents and squirrels, that have been exposed to contaminants could be consumed. According to Rosenfield et al. (1991), the primary prey species of goshawks tend to accumulate less pesticide in their tissues compared to other accipiter species. Furthermore, the USFWS concluded that pesticides and other contaminants appear to have not significantly affected goshawks in the U.S. (USFWS, 1998). While these studies reflect minimal, if any, detrimental effects to northern goshawk from exposure to herbicides could occur.

To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. In addition, **BIO-5** (WEAP) would educate workers to the risk of hazardous materials and provide protocols for notifying construction managers should spills or leaks be detected. Implementation of these measures would reduce impacts to a less than significant level.

Sandhill Cranes

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Greater and lesser sandhill cranes are not currently known to nest in the project area but are known as seasonal migrants. Implementation of the

project is not expected to result in disturbance to nesting birds or result in the loss of nesting or foraging habitat for this species. In the event this species occurs during construction, staffs proposed COCs would ensure the protection of foraging or visiting birds. Implementation of staffs recommended COCs would reduce impacts to this species to a less than significant level and would avoid impacts to a State fully Protected Species during construction.

Background and Analysis. Greater sandhill cranes are a State Threatened and State fully protected species that were once abundant breeders on the Modoc Plateau of northeastern California. This species is not expected to nest on the project site but would occurs as a seasonal migrant. Sandhill cranes typically use large freshwater marshes, prairie ponds, and marshy tundra during summer and grain fields or prairies during migration and winter. Greater sandhill crane nesting or stopover roosting habitat is limited within the proposed project area, but this habitat may expand as vegetation is cleared around access roads and WTG pads. The closest known nesting habitat is located approximately 20 miles east of the project site, in the Fall River Valley Important Bird Area (FWPA, TN 248288-6).

The proposed project site and broader project area are located at the edge of a known migratory pathway for this species (Donnelly et al 2021.) (see **Figure 5.2-3**). In addition, several hundred sandhill cranes were observed in flight during avian surveys conducted by the Applicant (FWPA, TN 248309-5) but they could not be identified to species. Sandhill cranes are expected to migrate over the project site in the spring and fall.

Direct Mortality or Displacement. Greater sandhill cranes are not known to nest near the project site, and it is unlikely they would do so given the habitat conditions that occur in the project area. Construction of the proposed project is not expected to result in direct or indirect impacts to breeding birds. However, these birds could be subject to project related disturbance should they use any of the small meadows as stopover sites during seasonal migration. In addition, as vegetation is removed prior to the construction of the WTG's and shaded fuel breaks these areas may become more attractive for migrating birds. While this species is largely associated with open habitats, they can use edge areas near riparian and meadows that are cleared along the many access road and turbine pads. While the risk of these birds lingering in the project area is low it cannot be ruled out. Staff considers the likelihood of nesting to be extremely low and has not proposed a COC for nesting sandhill cranes. Should a bird be detected resting or loitering within the project area impacts would be reduced through the implementation of **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), and **BIO-11** (Conduct Biological Monitoring During Construction). These measures educate workers regarding the protection of native wildlife and will include specific language on the procedures required should a new or unexpected species, such as greater sandhill crane, be detected in the project area during construction or operation of the project. With the implementation of these COCs impacts to this species are not expected to occur.

Habitat Loss and or Fragmentation. Construction of the project is not expected to result in the loss of important foraging habitat for greater sandhill cranes. The removal of large and dense timber lands and the management of shaded fuel breaks could increase foraging or loitering opportunities for this species in the future. Potential interactions with the WTGs and other project components are discussed under operational impacts.

Exposure to Herbicides and Hazardous Materials. This species could also be subject to exposure to herbicides should they forage in areas that were recently treated; although, the likelihood of this event is extremely low. To reduce impacts from exposure to hazardous materials and improper herbicide use Staff recommends **HAZ-1** which would require the preparation of a SPCC, **WORKER SAFETY-1** which includes construction worker safety programs to protect workers from exposure to hazardous material and waste, and **BIO-9** (Integrated Weed Management Plan) which includes the requirements and safe handling practices for herbicide use. The implementation of staffs recommended COCs would avoid impacts to this species.

Operation Impacts to Bats and Birds

The discussion of operational impacts to birds and bats are broken into three categories. These include (a) general operation and maintenance activities such as vegetation management and facility maintenance, (b) risks associated with the fire suppression and wildfires and how they affect bird and bat species, and (c) collision risks with the WTGs, transmission lines, and met towers.

General Operation Activities

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to a variety of bird and bat species. Impacts from O&M activities would be similar in type but reduced in magnitude relative to construction of the proposed project, except in the event of a large uncontrolled wildfire and collision risks (described below). Most impacts would occur to previously disturbed areas cleared or managed to support construction of the project. Operation noise could adversely affect nesting and or roosting species by masking predators or vocalizations during breeding. Implementation of staffs recommended COC's would reduce impacts to less than significant levels.

Background and Analysis. Direct and indirect impacts associated with O&M activities would be similar in type but reduced in magnitude relative to initial construction activities. Vegetation management, road work, and facility maintenance would include the loss of habitat, potential disruption of nesting and or denning sites, exposure to construction noise, fugitive dust, and herbicides. O&M activities would require vegetation management around the WTGs and along the various shaded fuel breaks. Birds and bats using these areas could be subject to displacement or mortality

depending on the specific O&M activity and the timing when the work is completed. The removal of timber and large stands of vegetation would likely result in a shift of nesting and foraging patterns by birds and bats. After initial clearing more disturbance tolerant species would likely become more common in the area and there would a shift to low scrub and ground nesting birds within vegetation management areas. Edge habitats would be expected to support a variety of birds. Large trees that could support bats would be removed from the project site which would likely reduce encounters with bats. However, bats can and do occupy various outbuildings and may use these structures opportunistically. Conducting work during periods when nesting birds or bats are present could result in nest or roost failure and would be considered a significant impact.

Birds and bats would also be subject to new baseline noise levels and vibration from the operation of the turbines. Noise would emanate from the turbine blades whenever they are operational. The turbine's noise level is approximately 56 dBA, at the base of the turbine which is slightly higher than the daytime and nighttime ambient noise level of 42 dBA per day. This could result in predator masking in some circumstances. Vibration from the WTGs is expected to be minimal and would be damped within a short distance. See **Section 5.9** (Noise and Vibration) for a more thorough discussion of this topic. Shadows would also move along the landscape as the blades rotate around the nacelle. This effect could result in increased vigilance for some birds, however there is no feasible mitigation to prevent this from occurring. O&M activities could also result in the introduction of new invasive weeds or could further spread invasive weeds that are already present in the project site.

To reduce impacts from O&M activity except for wildfire and collision risk, the applicant would implement **BIO-5** (WEAP), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), and **BIO-11** (Conduct Biological Monitoring During Construction), **BIO-17** (Special-Status Bat Avoidance Measures), **BIO-23** (Nesting Bird Avoidance and Minimization Measures), **BIO-24** (Willow Flycatcher Avoidance and Minimization Measures), **BIO-25** (Bald and Golden Eagle Avoidance and Minimization Measures), **BIO-26** (California Spotted Owl Avoidance and Minimization Measures), **BIO-27** (Northern Goshawk Avoidance and Minimization Measures), **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1**. With the implementation of these COC's impacts would be reduced to less than significant levels.

Wildfire Risks to Birds and Bats

Significant and Unavoidable Impact.

Basis for Conclusion. The risk of wildfires poses a substantial risk to common and special status bats. Even with staffs proposed COCs impacts would remain significant and unavoidable.

Background and Analysis. Wildfires can provide beneficial and adverse impacts to native birds and bats depending on the fire intensity, scale of the fire, fire frequency, timing of the fire (i.e., during the nesting season), and the specific life history of each species. Because of these uncertainties staff is considering a potential for a large, high intensity fire to occur during the breeding season across the project area and broader region including burning into portions of the SNF and LNF.

Common and Special Status Bats. Wildland fires can create an abundance of roosting sites for forest-dwelling bat species, such as little brown bat and long-eared myotis (Bond, 2015). Mixed- and high-severity fire in forest ecosystems also likely enhances foraging opportunities for bats (Buchalski et al., 2013). In mid-elevation forests burned at mixed and high severity in western Montana, Schwab (2006) noted that these species preferentially roosted in larger-diameter snags in high-density stands of fire-killed trees. While most of the project site does not support large trees with snags, they are present in adjacent forest lands particularly in the SNF and LNF. Many insect species inhabiting coniferous forests are highly evolved through adapting sensory organs or life strategies to exploit severely burned forests and in turn can create a superabundance of native insect prey for bats. Most bats have the capacity to flee wildfires provided temperature conditions are suitable. As large wildfires are most often associated with the activity period for bats and few large trees occur on the project site most impacts would occur to bats in offsite areas such as the LNF or SNF. These areas still retain many large trees that could support bat colonies and likely provide additional resources such as mines and large rock outcrops that may thermally protect bats from a wildfire. Should a wildfire occur on site or come to the site, where the turbines present obstructions and can impact aerial firefighting, it may spread to adjacent lands and would likely result in the direct loss of nursery colonies when young bats are unable to effectively flee a wildfire. Bats in thermally stable areas may be less prone to loss however staff is assuming a worst-case scenario that a fire will occur when young bats are unable to flee.

To reduce impacts the Applicant would implement **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Designated Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (WEAP), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (General Impact and Avoidance Measures), **BIO-8** (Habitat Restoration and Vegetation Management Plan), **BIO-9** (Integrated Weed Management Plan), **BIO-11** (Conduct Biological Monitoring During Construction)**, AQ-SC3**, **AQ-SC4**, **AWTER-1**, **WATER-2**, **HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, and **WORKER SAFETY-1**. Even with the implementation of these COCs impacts to common and sensitive bats would remain significant and unavoidable.

Common and Special Status Birds

The risk of wildfires during O&M was described for common wildlife species and could increase during the O&M phase of the project. The evaluation of impacts and risk to sensitive birds from O&M associated wildfires is based on several factors including if the

species is a resident or migratory bird, the dependency of specific habitat types such as riparian or older stands of conifer woodlands, and the potential for that species to be present during periods when wildfires are most common (i.e., summer through fall months in this location). Generally, when there are stand replacing fires that result in the loss or mortality of conifer woodlands, species that prefer those habitats decline and those that are more generalists or prefer broadleaf vegetation are more resilient or increase. Seavy and Alexander (2014) concluded that for a site in southern Oregon they found evidence that 8 out of 27 bird species decreased as a result of the fire. The strength of these patterns varied through time; several species that declined did not do so until the 2nd year of the fire, but by the 4th year after the fire the difference between burned and unburned areas had decreased. We found relatively few species that increased as a result of the fire. Many of the species that decreased as a result of the fire were generally associated with mature coniferous forest. Species associated with mixed-conifer forest did not exhibit strong responses to the changes created by the fire. (Ibid)

For the purposes of this evaluation staff based their conclusions of impacts that a fire would occur when eggs or nestlings are present in the nest and would be unable to escape should a large high intensity wildfire occur. Therefore, impacts would be considered significant and unavoidable.

Olive-sided flycatcher, Vaux's swift, and Lewis's woodpecker. Willow Flycatcher, yellow-breasted chat, yellow warbler, and other special status nesting birds and raptors. Bald and Golden Eagles. Northern and California Spotted Owl, Northern Goshawk, and Great Gray Owl.

Significant and Unavoidable Impact.

Basis for Conclusion. Should a wildfire occur on site or come to the site, it may spread to adjacent lands including the LNF or SNF. More importantly, should firefighting activities be hindered because of the large turbine heights and layout of the project it could contribute to stand replacing fires in adjacent lands and could result in significant loss of habitat used by these species in the region. Even with the implementation of shaded fuel breaks and staffs proposed COCs these impacts would be considered significant and unavoidable.

Background and Analysis

Olive-sided flycatcher, Vaux's swift, and Lewis's woodpecker are more dependent on older or late successional forests which do not occur on the project site. However, these communities occur in adjacent lands including the SNF and LNF.

Yellow warbler and yellow-breasted chat are typically associated with riparian habitats which are utilized for breeding, nesting, and foraging. Yellow-breasted chat prefer early successional riparian habitat with a well-developed shrub layer while yellow warbler is most frequently found near water in riparian habitats or in coniferous forests or shrubby habitats near water (Shuford and Gardali, 2008b). Willow flycatcher primarily build

nests on low shrubs and bushes often near the edge of willow thickets along streams in broad valleys, canyon bottoms, mountainside seeps, and at the margins of lakes and pools (Sedgewick, 2000; Gaines, 2005).

Riparian associated songbirds are less likely to be subject to long term habitat loss from O&M associated wildfires should they occur. Riparian vegetation can be more resilient to wildfires and is often capable of resprouting quickly after a fire provided access to ground and or surface water is present. In addition, insect eating species may benefit from the effects of wildfire. Seavy and Alexander (2014) found that arthropod abundance after a large fire increased after the first years of a fire. Raptors and other forest dwelling species not strongly associated with old growth forests would be expected to colonize adjacent areas or return post fire.

The risk of wildfires to bald and golden eagles is lower for these species as they likely occur in smaller densities across a wider region and often fledge their young earlier than many other forest dwelling birds. However, canopy fires in conifer woodlands would be expected to result in the loss of active nests and their young should fires occur during the breeding season. Post fire opportunities could occur in some area as fire killed trees could create opportunities for nesting and post fire foraging opportunities for golden eagles.

Northern and California Spotted Owls. Some evidence shows that spotted owl occupancy in areas following a high severity fire may not be significantly affected, as the post-fire landscape can provide high-quality foraging habitat for the species. As such, dominant owls tend to occupy the highest quality sites, while occupancy is reduced in mostly lesser quality sites (Lee and Bond, 2015). In fact, owls have been documented foraging in high severity burn areas within 1.5 km of core nesting and roosting habitat for up to 4 years following a fire (Bond et al., 2009). However, further studies have demonstrated contradictory data. For example, the King Fire of 2014 had a detrimental effect on spotted owls and spotted owl habitat in El Dorado County, California. This megafire caused a direct loss of suitable nesting and roosting habitat that will not be replaced for several decades, and the probability of owl site extirpation was seven times higher after the fire than before at severely burned sites, contributing to the greatest annual population decline observed over a 23-year study (Jones et al., 2016). It has also been reported that wildfires that result in tree basal mortality more than 50 percent, that reduce canopy cover to an average of less than 25 percent, will result in loss of breeding spotted owl pairs in an area (Stephens et al., 2016). Ganey et al. (2017) present the argument that high severity fire is pervasive enough within the range of the spotted owl to constitute a potential threat to the species. The recent Park fire of 2024 burned over 425,000 acres approximately 35 miles south of the project area which likely included habitat for California spotted owl and other dense forest associated birds on the LNF and adjacent timber lands (ESRI, 2024). In the short-term, high-severity fires may negatively impact northern spotted owls, but create suitable habitat at approximately 20 years, and high-quality habitat by 60–80 years post-fire

(Kennedy and Fontaine, 2009). The loss of these habitats statewide could pose a long-term risk to the species viability.

Northern goshawks are another forest dwelling bird that is strongly associated with older timber stands. This species is known from the region and likely nests within adjacent timber lands on the LNF and SNF. Large fires that spread to these areas would likely result in the loss of active nests and young should they occur during the breeding season. Great grey owls nest and roost in dense coniferous forest near large open meadows and could occur in adjacent forest lands.

In addition, to the loss of individual birds and their eggs or young, O&M related wildfires would contribute to habitat loss and fragmentation in the region. Birds that are displaced must either disperse to unoccupied territory or compete with resident birds that are present in unburnt areas. This can adversely affect birds in these areas and reduce survivorship. Birds that cannot find suitable nesting or foraging habitat are likely to suffer decreased reproductive success, be more easily predated, or die from lack or resources.

The Applicant has proposed several measures to reduce project related wildfires during O&M which include the placement of water tanks and the creation of shaded fuel breaks and vegetation management areas surrounding each WTG. However, these areas would still retain light flashy fuels which could result in a rapid spread of fire to adjacent habitat. In addition, **HAZ-6** (Fire Prevention Plan), **HAZ-7** (Fuel Breaks Management Plan), and **HAZ-8** (Site Water Supply Plan) would require the management of vegetation, implementation of fire protection and suppression methods, and developing a plan to determine the volume, number, and location of water tanks to support fire suppression on the project site. Staff considers it likely that a wildfire will occur in the region based on the existing fire history See Section 5.7 (Hazards, Hazardous Materials, and Wildfire). Should the operation of the project hinder firefighting and allow the fire to spread onto adjacent timber plots, National Forest Service lands, or grow into a stand replacing fire it would result in significant and unavoidable impacts to these birds.

California Condors and Sandhill Crane

Less than Significant Impact.

Basis for Conclusion. California Condors and Sandhill Crane are not known to nest in the project region and are unlikely to be affected should a wildfire spread to adjacent forest lands. Impacts to these species from the initiation and or spread of wildfires would be considered less than significant.

Background and Analysis. California Condors and Sandhill Crane are not known to nest in the project region and would be unlikely to be subject to loss or mortality from large stand replacing fires in this Region. An experimental population of condors has been released near the Pacific Coast and Sandhill cranes are known to nest east of the

project site in Ash Meadows. Fires would not be expected to affect migratory sandhill cranes except when fires are actively producing weather inducing columns of smoke. Therefore, impacts to these species from O&M inducted wildfires would be less than significant.

Operation Impacts to Bats and Birds

Collision with WTGs, Met Towers, and Other Infrastructure

In the United States wind energy generation in 2012 was estimated to have killed 600,000 (Hayes 2013) to 888,000 bats (Smallwood 2013), 214,000 to 368,000 small birds (Erickson et al. 2014), and 234,000 (Loss et al. 2013) to 573,000 (Smallwood 2013) birds of all sizes. Because installed wind energy capacity in the United States doubled from 2012 to 2020, bird and bat fatalities likely also increased (Smallwood and Bell 2020).

Collision fatalities among birds and bats have been an incidental effect of wind energy since the first large-scale deployments of wind turbines (Loyd et al 2023). Collisions can occur to both resident and migratory birds and the impacts of these mortalities can have adverse effects on local and regional populations for some species. Loyd (2023) found that as a group, birds show two peaks in fatalities that correspond with spring (May) and autumn (September) migration, with the autumn peak in fatalities generally exceeding the spring peak in magnitude (Choi et al 2020). This pattern highlights the spatial element of risk–where turbines are located relative to migratory routes and the risk associated with flight behavior during migration (Loyd et al 2023). Staff expects that seasonal migrants including a variety of songbirds, waterfowl, owls, cranes, and raptors would be at risk as well as local resident birds either detected by the Applicant or known to occur in the region.

As described in the CEC and CDFG's California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC and CDFG, 2007), lead and responsible agencies should "make estimates of potential fatalities and risk to individual species and populations to determine the level of impact and to develop avoidance, minimization, and mitigation actions" to "comply with CEQA and address other wildlife protection laws." The "pre-permitting assessment" level of effort depends on the category of the project site. Category 1 (sites with available wind–wildlife data) and Category 2 (sites with little existing information and no indicators of high wildlife impacts) would require a lower level of pre-permitting assessment, whereas Category 3 (project sites with high or uncertain potential for wildlife impacts) and Category 4 (site inappropriate for wind development) would require a higher level of pre-permitting assessment.

As described by the CEC and CDFG guidelines (Guidelines; CEC and CDFG, 2007), "baseline" bird studies are used to determine: 1) the species of birds that use the area, and how numbers vary through the year; 2) how much time birds spend within the rotor-swept area, and how this varies by season; 3) an estimated range of fatalities that might result from the project, and how estimated bird use of the site compares to other

wind sites that also have fatality estimates or information; 4) potential micro-siting, design, or mitigation measures that could reduce projected impacts; and, 5) other studies or pre-permitting data needed for post-construction impact assessment.

The Draft USFWS Wind Turbine Guidelines Advisory Committee Recommendations (Draft USFWS Guidelines) suggests applying a tiered approach to evaluating and minimizing the risk of wildlife impacts from wind energy projects, including preliminary evaluation or screening of potential sites (Tier 1), site characterization (Tier 2), field studies to document site wildlife conditions and predict project impacts (Tier 3), post-construction fatality studies (Tier 4), and other post-construction studies (Tier 5) (USFWS 2009).

The Applicant completed a variety of technical studies to meet the CEC and CDFW guidelines. These studies were conducted generally following the tiered approach outlined in the US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines and USFWS Eagle Conservation Plan Guidance (ECPG) (FWPA, TN 248309-5). These studies provide information for Tier 2 (Site Characterization) and Tier 3 (field studies and prediction of project impacts) pursuant to the Draft USFWS Guidelines' tiered approach. These studies employed avian point count stations, raptor nest searches, protocol surveys for target species, and acoustic bat monitoring conducted by qualified biologists utilizing standard survey protocols as described by CEC, CDFW, and USFWS to assess the potential collision risk to birds and bats.

Most of the avian and bat data for the original Fountain Wind project was completed by the Applicant and submitted to the Shasta County Planning Department to support the preparation of a Draft and Final EIR. At that time both the USFWS and CDFW provided extensive comment letters regarding the need to complete additional studies to better understand the use of the area by various species of birds. The USFWS noted that aerial surveys for golden eagles may not detect nesting golden eagles. Further both agencies noted that use of existing avian mortality data from the nearby Hatchet Ridge Wind Farm may not provide an accurate assessment of risk for the Fountain Wind project as the turbine size and layout are different. In addition, the Hatchet Ridge Wind Farm only performed carcass surveys for two years after commencement of operations (Tetra Tech, 2013). Thus, data is limited.

Staff considers the Fountain Wind project area as a Category 2 to 3 based on the age of the data and because the site is located adjacent to a known migratory pathway for sandhill cranes.

Collision Risk. Collision risk is the number of collision fatalities for a species or group of species divided by the number of individuals of that species or group in the zone of risk (area where the species can travel through and be exposed to the collision factor) (USFWS, 2009). USFWS acknowledges that direct, quantitative estimates of individual, group, or population collision risk is difficult and "usually beyond the scope of wind energy project studies due to the difficulties in evaluating these metrics" (USFWS,

2009); therefore, collision risk estimates are typically qualitative and utilize comparisons among existing wind energy projects and/or design alternatives. USFWS states that the "assessment of risk should synthesize sufficient data collected at a project to estimate exposure and predict impact for individuals and their habitat for the species of concern, with what is known about the population status of the species, and in communication with the relevant wildlife agency and industry wildlife experts" (USFWS, 2009).

The groups of birds potentially at risk from collisions with the Fountain Wind WTGs, MET towers, and collector lines include raptors, migrating passerines and seabirds, migrating waterfowl, nocturnal species, and resident birds. Resident and migratory bats are also at risk from collision and barotrauma. Barotrauma is a phenomenon caused by sudden and extreme changes in atmospheric pressure and is a known source of mortality to bats at windfarms. Factors that affect the risk of collision and mortality include:

- Level of use by the species. For example, in areas with greater raptor use, the risk to those species is higher. In addition, if a wind farm is placed in a known migratory corrido the risk to migratory species increases.
- Habitat present in proposed wind farm area. Managed forests for timber production often have lower species diversity compared to more natural lands.
- Availability and type of habitat and selected prey species. For example, the transition of conifer woodland to more open spaces along managed fuel breaks and around the WTGs to low growing vegetation could increase prey such as the availability of California ground squirrels and small mammals for golden eagles and red-tailed hawks.
- Proximity to large areas of open water or aquatic resources for bald eagles and other water birds.
- The placement and layout of the WTGs (such as ridgelines versus mid slope, single row of turbines compared to multiple rows). Larger WTGs spaced at wider intervals may reduce the number of potential collisions.
- Availability of potential perches in adjacent habitat and on facility structures including MET and transmission line towers, fencing, and the WTGs may increase the susceptibility of raptor fatalities.
- WTG size and rotor height. Older style WTGs were shorter with rotors that were lower to the ground, which brought a greater percentage of raptors foraging in the area into the same height as the rotors. Larger, modern WTGs are taller with rotors higher off the ground; thus, foraging raptors are less likely to collide with rotors.
- Rotor blade tip speed and rotational speed. Newer WTGs with slower speeds may be associated with lower avian fatality rates.
- The amount of time a bird spends at heights within the rotor swept area (RSA) or rotor swept heights (RSH).

- Lighting. Nighttime lighting of turbines and MET towers as well as exterior lighting at facilities may attract bats and or disorient birds and increase mortality rates.
- Operating time. Use of seasonal curtailment or curtailment under specific conditions such as low calm nights versus year-round operation may reduce avian and bat risk compared to continuous operating time.
- Power line height and electrocution. Power lines located within the foraging and flying altitudes of raptors and bats may result in electrocution should these species contact the lines. Additionally, the poles may serve as perches or nest sites for raptors and other avian species.

Avian Use and Migration. The project area is in the Pacific Flyway, a broad region that supports a variety of migratory birds. In addition, the site is located between upland habitat on the Modoc Plateau and foraging, breeding, and wintering habitat in the Central Valley. The site is located near the Fall River Valley IBA which supports a high diversity of ducks and shorebirds, including breeding sandhill cranes (FWPA, TN 248318). Thousands of ducks and geese over-winter here, and the site provides a staging area for migrating species such as the cackling Canada goose, a rare subspecies. The Pit and Fall rivers support large populations of breeding and wintering bald eagles and osprey and the open valley provides important winter foraging habitat for raptors. Swainson's hawks, long-billed curlews (Numenius americanus), burrowing owls, black swifts, and tricolored blackbirds are known to nest in the valley, while bank swallows, a state threatened species are known to nest along the Pit River. (FWPA, TN 248318)

The Upper McCloud River IBA is also notable for a large population of breeding willow flycatchers, a state endangered species (FWPA, TN 248318). These and other species have the potential to overfly the site and are at some risk of collision with the WTGs and MET towers.

Based on two years of avian use studies, the Applicant concluded the site does not appear to be located in an important migratory pathway for birds. Staff acknowledges that the avian data appears to be lower compared to some windfarms but notes that the project area is immediately adjacent to a known migratory pathway for sandhill cranes (Donnelly et al 2021). Sandhill crane movements were derived from 108 individual birds captured and fitted with GPS leg bands (Ibid). These birds move from western states to locations within California's central valley. Based on tracked data it is likely that these species will continue to overfly the project site during the life of the project and several hundred were recorded during avian point counts by the Applicant; however, due to the elevation the birds could not be identified to the species level. Both species of sandhill cranes are considered sensitive by the CDFW. Greater sandhill crane is a state listed species and lesser sandhill cranes is a SSC.

Avian Use Surveys. The Applicant conducted a variety of focused and protocol surveys for special status and resident birds including bald and golden eagles, northern

goshawk, southwest willow flycatcher among others. In addition, two years of fixed-point avian use surveys were conducted at 39 observation points located throughout the project area. Two separate surveys were conducted at each point every month. The first survey included a 10-minute (min) small bird survey followed immediately by a 60-min large bird survey. The first-year study (Year 1) was conducted over a 14-month period from April 2017 through May 2018, and second year (Year 2) avian use surveys over a 10-month period from June 2018 through March 2019. (FWPA, TN 248309-5; FWPA, TN 248309-1) During the 2018–2019 avian use and flight behavior studies, only 383 surveys were conducted due to snow and inclement weather (FWPA, TN 248309-5; FWPA, TN 248309-1). In addition, only 2 surveys were conducted in the Fall and one in the spring, a time when Songbird (small bird) surveys were conducted separately from large bird surveys.

Common Birds, Bats, and Raptors

Significant and Unavoidable Impact.

Basis for Conclusion. Wind farms are a known source of mortality to birds and bats. Wind power has been associated with avian fatalities caused by collisions with WTGs and other wind plant structures (Orloff and Flannery,1992). Merriman (2021) took an average of three studies from 2013-2014 and determined that an average of 366,000 birds were killed by wind turbines in the US in 2012. At that time there were 44,577 turbines compared to approximately 65,548 turbines in 2021. They concluded that approximately 538,000 birds died from WTGs in 2021. Although common birds and raptors are not considered rare, they are still protected by State and federal regulations including the MBTA. In addition, it is difficult to predict how the loss of common birds over a 35-year timeframe will affect local or regional populations. While many common birds have stable populations there is mounting evidence that many avian species are in decline and several bird species have recently been suggested or petitioned for listing. In addition, many species currently listed by State and or federal governments including northern and California spotted owls, and burrowing owls are at risk of further habitat loss or displacement which could affect their long-term viability.

Avian monitoring data for the adjacent hatchet Wind Farm concluded that the estimated annual fatality rate for all birds was 3.5 bird fatalities/turbine/year or 154 bird fatalities/project/year (Tetra Tech, 2014). With a 35-year project operating period this would result in approximately 5,390 bird deaths. However, staff notes that use of the Hatchet Ridge Wind Farm data should be used with caution. As noted in the 2019 CDFW comment letter to Shasta County, CDFW cautioned use of the Hatchet Wind Farm Data when making inferences to mortality risk for the Fountain Wind project for a number of reasons. For example, the project includes taller turbines with a larger rotor swept area and includes multiple rows of turbines compared to the single turbine row for hatchet Wind. In addition, CDFW noted that the applicant changed the way fatality estimates were reported in the final report and recommended specific protocols be developed for the project. Likewise, members of the public raised concerns that the monitoring frequency and search area around the turbines was too infrequent and too

small to detect all mortalities. This would likely result in missed birds and bats that were killed by collision with the WTGs or removed from the site by predators. Staff has applied the Hatchet Wind Farm data as a proxy and acknowledges that mortality estimates may be different and likely higher based on the larger rotor sweep area and configuration of the turbines.

Staff concluded if the same mortality rates were applied to the project the mortality rate for all birds would be an average of 168 birds lost per year for 48 turbines or 5,880 birds over the 35-year life of the project. This includes a range of 94-274 birds lost per project year or 3,290 birds to 9,576 birds over the 35-year life of the project. Calculations related to mortality are described further below. Note that the Applicant concluded that these estimates may not be strictly applicable to the project as the turbines are larger, with a bigger rotor sweep area, and more numerous compared to Hatchet Wind. In addition, staff considers there to be a higher risk of collision compared to Hatchet Wind due to the configuration of the WTG fields. Thus, the annual bird deaths may be closer or higher than the 9,576 value. Therefore, even with staff's proposed COCs the ongoing loss of common birds and raptors would be considered significant and unavoidable.

Background and Analysis. Operation of the Fountain Wind project is expected to result in mortality and injury to a variety of resident and migratory avian and bat species from collisions with the 48 WTGs, 3 MET towers, and an existing PG&E 230 kV transmission line that crosses near the middle of the project site in a general east-west orientation. Per FAA regulations the wind turbines and MET towers would include lights for visibility. The WTGs have a maximum tip height of 610 feet above the ground and the MET towers may be up to 394 feet above the ground. The project layout places the WTGs in ten "rows" with the number of WTGs per "row" varying from 2 to 10 WTGs. The turbine "rows" are nearly but not quite parallel in a general northwest-southeast orientation with the distances between the rows varying from approximately 0.4 to 1.3 miles (FWPA TN 248330-2).

The magnitude of these impacts can vary from year to year but would be expected to result in the loss of thousands of birds and bats over the lifetime of the project. Studies indicate that raptors and passerines appear to be the most susceptible to WTG collisions in the United States (AWEA, 1995). Collisions with WTGs have also been an ongoing source of mortality for bats.

An important consideration when assessing the risk of bird and bat from collisions with WTGs is that it is often difficult to predict, and depends on a variety of factors including species composition on a site; behavior and flight characteristics of species present; migratory patterns; site characteristics including habitat, weather, proximity to water, features that concentrate migrants, and weather; and wind farm features such as WTG type and configuration and lighting (Marques et al., 2014). Due to the complexity of the multiple factors that contribute to collision risk, pre-construction risk assessments and surveys may not accurately predict actual mortality during operation (Ferrer et al.,

2012). Therefore, ongoing operational monitoring and adaptive management are important components to mitigating avian and bat fatalities and have been proposed as one form of compensatory or adaptive management for all species of birds and bats.

More importantly while avian and bat monitoring is a useful tool for identifying and estimating impacts to various species it does not account for every species of bird that is potentially killed by the wind farm. Finding zero fatalities might mean that none occurred or that fatalities occurred, but none were found (Smallwood and Bell, 2020). Several factors should be considered when using this tool as a metric to assess impacts. Small birds are often overlooked and may include rare species that are not considered in the analysis. In addition, large and small birds may be removed by predators prior to the searcher conducting the surveys. Some birds can only be identified to family because of decay, predation, or from the damage of the collision while other birds cannot be identified at all. Similarly, some sensitive birds likely collide with the WTGs after the initial monitoring period has been completed. Another factor to consider is not all turbines are inspected under the same frequency which can lead to an underestimation of mortality or missed lost to predation or decay. Staff acknowledges that wind farm developers and researchers make good faith efforts to counter these uncertainties with searcher efficiency and carcass persistence trials, however we must recognize that by their definition, rare or uncommon species would be expected to occur in smaller numbers and not all species killed will be detected.

Migratory and Resident Small Birds. Based on the data presented by the Applicant small birds are expected to be at the highest risk of collision with the WTGs because of their relative abundance and percentage of time spent within risk areas such as Rotor Sweep Height (RSH) or Rotor Sweep Areas (RSAs). Small birds have the potential to collide with the WTGs and other facilities and would be subject to direct mortality or be injured and subject to higher predation risk and eventual mortality.

Two years of small bird surveys were conducted in the project area and approximately 2,408 small bird observations of 71 different species were detected during the first year and 1,711 including 50 different species during the second year (FWPA, TN 248318). The most abundant birds observed during these surveys included dark-eyed junco, mountain chickadee, western bluebird, and Steller's jay. Small bird abundance in both years of avian surveys was highest in the fall, followed by summer and spring, and lowest in the winter. Species richness across both years of small bird surveys was highest in summer. The seasonal abundance and species richness results suggest that small bird use is moderate and relatively consistent across seasons and across the project site.

The Applicant noted that small bird abundance in both years of avian surveys was highest in the fall, followed by summer and spring, and lowest in the winter. Species richness across both years of small bird surveys was highest in summer. The seasonal abundance and species richness results suggest that small bird use is moderate and relatively consistent across seasons and across the project site. The results of small bird

avian surveys further suggest that there is no specialized use of nesting habitats by resident birds, use of the area by migratory songbirds is non-concentrated.

During 10-min small bird surveys, 274 groups (977 observations) were recorded flying within the 100-m radius survey plots. Of these, 42.4% were observed flying at heights within the estimated RSH and 57.6% were observed below the RSH; none were observed flying above the RSH. Passerines were the small bird type most often observed flying within the RSH (44.2%). (See FWPA, TN248309-1 for additional data on avian use of the project area). Although passerines were observed flying through the proposed RSH approximately 44 percent of the time there is potential for all avian species to fly within the RSH height range.

Avian monitoring data for the adjacent Hatchet Wind Farm concluded that the estimated annual fatality rate for small birds was 2.4 bird fatalities/turbine/year or 104 bird fatalities/project/year (Tetra Tech, 2014). Data from Hatchet Wind is below:

- The estimated annual fatality rate for small birds was (4.67 + 0.72 + 1.70)/3 = 2.4 bird fatalities/turbine/year or (206+32+75)/3=104 bird fatalities/project/year.

If you assume a 35-year project operating period that would result in approximately 3,640 small birds. Staff concluded if the same mortality rates were applied to the project the mortality rate for small birds would be 115 birds lost per year for 48 turbines or 4,032 birds over the 35-year life of the project. This includes a range of 0.72-4.67 birds lost per project year or 1,201 birds to 7,848 birds over the 35-year life of the project. Staff's calculation based on the projects Avian Use data and mortality estimates from Hatchet Wind are described below.

- Small birds 2.4*48=115.2 or 115.5*35=4,032 small birds over the life of the project. Range of 0.72*48=34.6/project year so 34.6*35=1,201 to 4.67*48=224.2/project/year or 224.2*35=7,848 birds.

Migratory and Resident Large Birds and Raptors. Large birds included waterbirds, waterfowl, shorebirds, diurnal raptors, vultures, upland game birds, doves and pigeons, and large corvids.

During the 60-minute large bird surveys, a total of 3,267 observations were recorded in Year 1 and 8,459 observations were recorded in Year 2. This included the observation of 25 and 22 separate large bird species in Year 1 and 2, respectively.

The Applicant surveys found that seasonal trends in diurnal raptor use were very similar between years, with the fall and spring migration periods having the highest use. Fifteen species of diurnal raptors were detected over all seasons during the two years of surveys, including Cooper's hawk, northern goshawk, sharp-shinned hawk, ferruginous hawk, red-tailed hawk, rough-legged hawk, northern harrier, red-shouldered hawk, bald eagle, golden eagle, merlin, American kestrel, osprey, prairie falcon, and turkey vulture. The red-tailed hawk had the highest use of any diurnal raptor species during all four seasons. Among other diurnal raptor species, sharp-

shinned hawk and Cooper's hawk had relatively high use in fall and spring. Overall, raptor use was higher during migration seasons. All of these species have the potential to fly within the RSH.

Diurnal raptors that have the potential to occur within the project site include the State Threatened Swainson's hawk, white-tailed kite, and American peregrine falcon (the latter two are state fully protected species). None of these three species was recorded during two years of large bird surveys but are known from the region. The northern harrier, a California SSC, was recorded in both years within the project site. Six other species of raptors on the CDFW watch list that were observed include the Cooper's hawk, ferruginous hawk, merlin, prairie falcon, osprey, and sharp-shinned hawk. Obvious areas of concentrated use by eagles or other diurnal raptors or consistent flight patterns were not observed (see WPA, TN248309-1 for additional data on avian use of the project area)

Data from the Applicants Avian Use Studies found that in Year 1 24.2% of flying large birds were recorded within the RSH, 71.7% were above the RSH, and 4.1% were flying below the RSH for turbine blades of 30-200 m AGL. Corvids were the most common large bird recorded flying within the RSH (76.2%). Over half (63.4%) of all diurnal raptor observations were recorded flying within the RSH, with 27.8% recorded above the RSH, and 8.8% recorded below the RGS. Among diurnal raptor subtypes, northern harriers and eagles were most often observed flying within the RSH (100% and 83.3%, respectively).

Avian monitoring data for the adjacent Hatchet Wind Farm concluded that the estimated annual fatality rate for large birds was 1.13 bird fatalities/turbine/year or 50 bird fatalities/project/year for 44 turbines (Tetra Tech, 2014). Using this same predicted mortality rate for 48 turbines over a 35-year project lifespan staff concluded that:

- Large bird mortality would be 1.13*48=54.2 birds per year or 54.2*35yrs = 1,898 large birds over the life of the project. This has a lower range of 1.08*48=51.8 or 51.8*35yrs= 1,814 to 1.2*48*35=2,016 over 35 years.
    - Ave is 1,898 with range from 1,814 to 2,016 over 35 years.

During Year 1 of fatality monitoring at Hatchet Ridge, the estimated annual fatality rate for raptors was 0.06 per wind turbine per year. During the second and third year, raptor fatality rates could not be calculated due to low sample sizes, with only eight diurnal raptor fatalities documented over three years. These included four red-tailed hawks, two sharp-shinned hawks, and one Cooper's hawk, which are the three most common raptors also observed in the project site; and one turkey vulture (Tetra Tech, 2014). Therefore, expected mortality rates for raptors was not available as only a small number of raptors were detected during the Hatchet Avian Mortality Monitoring. Based on this data, the Applicant estimated that between 4.3 and 53 raptors would be killed per year for the original Fountain Wind project if no operational considerations were taken such as curtailment or other measures. Using this data staff concluded that:

- If between 4.3 and 53 raptors are killed per year. Average of 28 per year. Then and average of or 1,002.8 or between 151 and 1,855 raptors would be killed during the 35-year operational lifespan of the project.
    - 4.3*35= 151 to 53*35=1,855 over 35 years.

Waterfowl use was highest in fall (65.71 birds/800-m plot/60-min survey), followed by spring (11.25), winter (10.69), and summer (0.15). Greater white-fronted goose accounted for all waterfowl use in fall, and snow goose accounted for all waterfowl use in spring and the majority (75.3%) of use in winter. Other, less abundant waterfowl species recorded included Canada goose (summer and winter only) and tundra swan (winter only). Waterfowl accounted for over 90% of overall large bird use in fall and winter, and 46.9% in spring, but only 4.1% in summer. Waterfowl were observed most frequently during winter and fall (9.0% and 7.7% of surveys, respectively) and less often during spring and summer (3.1% and 0.9% of surveys, respectively). (FWPA, TN 248309-1) The Avian Use Study (FWPA, TN 248309-1) also found that the majority of waterbirds and waterfowl were recorded above the RSH (78.5% and 97.1%, respectively).

Avian monitoring data for the adjacent Hatchet Wind Farm concluded that the estimated annual fatality rate for waterfowl was low with an average of 0.72 bird fatalities/turbine/year or 32.3 bird fatalities/project/year for 44 turbines (Tetra Tech, 2014). Using this same predicted mortality rate for 48 turbines over a 35-year project lifespan staff concluded that:

- Waterfowl mortality would range from 0.72*48=34.6 birds per year or 34.6*35yrs = 1,211 birds over the life of the project. Range of 0.63*48*35 = 1,058 birds to 0.9*48*35= 1,512 birds over 35 years.
    - Ave is 1,211 with range from 1,058 to 1,512 over 35 years.

Based on the Hatchet Wind data, operation of the project's WTGs for a 35-year period will likely result in the loss of approximately 3,640 small birds (range of 1,201 to 7,848), 1,898 large birds (range of 1,898 to 2,016), 1,002.8 raptors (range of 151 to 1,855), and 1,211 waterfowl (range of 1,058 to 1,512). However, based on the larger turbine size and configuration of the project it is possible that the total mortality numbers would be larger compared to the Hatchet Wind Site. Similarity, in a CDFW comment letter to the Shasta County Planning department on the previous DEIR the CDFW recommended caution when inferring fatality rates expected at Fountain Wind based on Hatchet Ridge data. In addition, numerous intervenors have suggested that the avian mortality studies conducted at Hatchet Wind farm may have used a search radius that would not account for all avian mortalities (TN# 253307 Jim Wiegand Comments Against Fountain Wind #6). For example, the search radius around the WTGs at Hatchet Wind were 63.5 meters from each side of the turbine to create a 127-meter square plot. The WTGs at Hatchet Wind have a rotor diameter of 94 meters or 308 feet.

Birds that are hit by the blade may not drop directly below the strike point and could be projected outside the search area into heavy vegetation and not detected during mortality searches. Collisions that occur during periods of high wind could also project birds or bats outside the search radius. In a presentation at the WWRIM in 2019 titled "Where Carcasses Land – and Why It Matters", Huso noted that the spatial distribution of bat carcasses depends on wind speed during the night of their demise. The study found that the proportion of carcasses landing beyond 60 m of the turbine increased consistently with increasing wind speed (WWRIM 2019 a presentation on Where Carcasses Land – and Why It Matters Presenter: Manuela Huso, United States Geological Survey (USGS)). Staff assumes this same condition could occur for birds which may lead to error in some circumstances. However, other studies indicate that approximately 60% of bird carcasses fall within 50m of the turbine and for contrast, 90% of bat carcasses fall within 50m of the turbine. Small birds and large bird carcasses have a similar fall distribution. (AWWIC 2020)

Staff considers the available data for Hatchet Wind useful to generate some estimates of bird mortality from the project but concurs that it may not accurately represent the avian and bat mortality that is expected to occur for the project. Most of the applicant's mitigation is centered on post construction monitoring and the implementation of actions after the impacts occur. Except for sandhill cranes (discussed below) the Applicant concluded the project site does not appear to be part of a major migratory movement corridor, and the bird abundance is relatively low compared to other windfarms, overall collision risk for diurnally active avian species is low. While staff concurs that avian use for this area is lower compared to other windfarm locations the data is aged and may not reflect current avian use of the site. In addition, site conditions may become more favorable for some edge birds and raptors as vegetation is cleared for the fuel management zones and the areas around each WTG. In addition, the project site includes numerous small drainages, streams, and wet meadows which likely attract additional bat and avian species. While the footprint of the project is smaller compared to what was assessed in the Shasta County EIR it is still likely to result in the loss of numerous raptors, including special status species that may occur as migrants. As most raptors are long lived and do not reproduce at an early age this can have affects to local occurrences, especially if the loss becomes chronic. Even for relatively common birds the ongoing loss through regional habitat loss, wildfires, climate change, and collision with WTGs and MET towers contributes to the loss of resident and migratory birds. As noted in the State of the Birds Report (2022) many birds across the U.S. show downward trends in every habitat except in wetlands. While this report is nationwide it suggests that avian trends for many species are declining and that even common birds can be at risk of declining populations. For these reasons, staff concludes the estimated number of bird deaths from the project described above to be significant and unavoidable. This is especially so as these numbers may reflect some level of undercounting.

To reduce impacts to birds and bats the applicant has proposed several measures including conducting post construction mortality monitoring for three years after the

initiation of operation. If unexpected levels of mortality are encountered impacts to resident and migratory birds including raptors would be reduced by operational modifications such as curtailment of turbine speed, ultrasonic deterrence systems or other mitigation to minimize raptor and bat fatalities. Additional measures are proposed for bald and golden eagles (discussed below).

Staff and CDFW have considered the Applicants proposed mitigation and have incorporated portions of that language into the proposed **COCs** to reduce and or minimize impacts to avian species and bats. At this time staff recommends **BIO-28** (Avian and Bat Mortality Monitoring And Adaptive Management Plan), **BIO-29** (Implement a Technical Advisory Committee for Avian and Bats), **BIO-30** (Implement Seasonal Curtailment), **FOREST-1** (The project owner shall provide a fee payment to a land trust for the permanent conversion of 510 acres of prime timberland (Site Class I and II) at a one-to-one ratio of equivalent site classification) and **FOREST-2** (The project owner shall reforest the 548 acres of temporarily converted timberlands, including site preparation and planting of conifer seedlings).

BIO-28 (Avian and Bat Mortality Monitoring and Adaptive Management Plan) The Plan will require post operation mortality surveys to estimate mortality rates for different species of birds and bats from collisions with WTGs and provide a variety of mechanisms to reduce mortality including the use of monitoring systems to track birds and curtail suspect WTGs, acoustic deterrence for bats, and on-site avian monitoring. It will also require demonstration that the project owner has obtained or is in the process of acquiring an eagle take permit from the USFWS.

BIO-29 (Implement a Technical Advisory Committee for Avian and Bats) requires the establishment of a Technical Advisory Committee (TAC) composed of the Applicant, CEC, CDFW, USFWS, local land managers such as the USFS, third-party subject matter experts, such as organizations dedicated bird and bat conservation and research, and scientists familiar with post-construction survey protocols. The TAC would provide oversight and guidance during the fatality monitoring stage and work collaboratively to propose and implement additional mitigation and operational strategies should avian mortality exceed expected thresholds. **BIO-30** (Implement Seasonal Curtailment) would provide a plan for seasonal curtailment specific to certain wind and seasonal conditions to reduce collision risk to birds and bats. It will also provide a mechanism for the project owner to minimize the curtailment periods based on monitoring and deterrence.

Bald and Golden Eagles

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Bald and golden eagles are known from the project region but appear to be present in relatively low numbers. The closest known bald eagle nest is approximately three miles away. Two years of avian assessments found approximately 35 minutes of risk time for bald eagles the first year and 16 minutes the second year.

Golden eagles risk time was two and four minutes respectively. While this data is old, it suggests low risk for these species.

Bald eagles are not expected to use the project area as key foraging habitat due to the limited amount of open water. Conversely, golden eagle use of the project area may increase as the conifer woodlands are transitioned to low scrub communities surrounding the WTGs and from the large access roads and shaded fuel brakes that would be established. Should this result in the increase of prey items such as ground squirrels, brush rabbits, and jackrabbits the risk of attracting golden eagles could increase.

Staff considers it is likely that a eagles will collide with the WTGS at some point during the life of the project and have proposed COCs to offset the loss and ensure impacts to fully protected species meet the CDFW requirements of full mitigation. In addition, supplemental surveys would be required to assess usage before and after construction and to evaluate mortality through ongoing mortality studies and adaptive management.

Background and Analysis. Operation of the project could have direct impacts on bald and golden eagles through collision with WTGs, MET towers, or existing power lines. Avian use studies of the project area found lower use of the area by bald eagles, and comparable use by golden eagles, when compared to preconstruction surveys at the Hatchet Ridge project site.

Aerial and ground-based eagle and raptor nest surveys conducted during the breeding seasons from 2017-2019, and fixed-point eagle use surveys from April 2017 through March 2019 found from nine (2017) to eleven (2019) occupied bald eagle nests within 10 miles of the project site. Most of these were along the Pit River which is known to support large numbers of bald eagles. The closest nest to the project area is approximately 3 miles away near Lake Margaret. Twenty-two observations of bald eagles documented over the two-year survey period. Thirteen observations were made in the winter.

Aerial nest surveys did not detect any nesting golden eagles within 10 miles of the project area. However, three historical golden eagle nests could not be located during either year of aerial surveys. During the two-year fixed-point eagle use survey, three golden eagle observations were made. All three observations of golden eagles were made during the spring migration season.

The most directly relevant data for an assessment of the project's potential risk to eagles comes from the nearby Hatchet Ridge Wind project, specifically its two-year preconstruction avian use survey reports and three-year post-construction mortality monitoring report (Tetra Tech, 2012; Tetra Tech, 2013; Tetra Tech, 2014). Both the Hatchet Ridge project and the project occur in more forested areas compared to most windfarms in California which could have an influence on the collision risk in this location. In addition, the Hatchet Ridge project's post-construction avian fatality

monitoring did not identify any bald or golden eagle mortalities from project operation (Tetra Tech, 2014). Additional information on eagle risk is described below.

Bald and Golden Eagle Usage and Risk Minutes. The Applicant based eagle risk on the avian mortality data collected for the Hatchet Wind Farm and surveys conducted for the project. No eagle mortality was detected during the first three years of monitoring at hatchet Wind and the Applicant concluded that eagle usage of the project site is low. In Year 1, 16 bald eagle observations were recorded, resulting in 35 bald eagle risk minutes. In Year 2, six bald eagle observations and one golden eagle observation were recorded within the project area, resulting in five eagle risk minutes were recorded within the 800-m plots at flight heights of 200 m or less AGL. The majority (80.0%) of bald eagle risk minutes were recorded in winter, with only a single bald eagle risk minute recorded in spring and no risk minutes recorded in summer or fall. Bald eagle risk minutes per minute of survey were highest during spring followed by winter. Golden eagle use of the project was very low during both years of study. Two observations were made in Year 1 and one observation was in Year 2. Both observations occurred in the spring. In the Year 1 surveys golden eagle was observed in flight for a total of five minutes, which resulted in two golden eagle risk minutes. During the Year 2 surveys golden eagles were observed in flight for a total of four min, all of which were recorded in spring. All four minutes of flight were within 800-m plots at flight heights of 200 m or less AGL. (See FWPA, TN248309-1 for additional data on avian use of the project area).

No bald or golden eagle fatalities have been documented at Hatchet Ridge (Tetra Tech, 2014). The Applicant concluded that based on the generally low direct impacts to bald eagles documented in the Pacific Northwest, including at Hatchet Ridge, as well as the relatively low use of the project by bald eagles the risk of collision at the project is anticipated to be low. However, staff consider it likely that a bald or golden eagle will collide with a WTG or MET tower during the life of the facility. In addition, the project WTGs would be 62 percent taller with 70 percent larger blade diameters than the Hatchet Ridge project and would be placed in multiple rows compared to the single row of WTGs at Hatchet Wind.

Staff concludes that there is some uncertainty of the risk to eagles based on the age of the data, the broader project footprint and the size of the proposed WTGs. The Applicant did not provide an estimate of expected mortality for bald or golden eagle and concluded the risk was low based on previous monitoring and survey data. While many factors contribute to the risk of collision with WTGs staff used a conservative estimate of that up to 1 bald and 1 golden eagle would be subject to mortality every five years. For reference the original Shasta County EIR had an annual fatality threshold of one bald eagle per year. Staff considers the loss of 1 bald and 1 golden eagle per year to be less than significant under CEQA and that compensatory actions could be implemented to comply with USFWS and CDFW requirements under the Bald and Golden Eagle Acts and to meet the full mitigate standard.

The Applicant has proposed to offset operational impacts to bald and golden eagles if necessary, by retrofitting electrical utility poles that pose a high risk of electrocution to these species. In addition, the Applicant would coordinate with the USFWS and implement the recommended USFWS Eagle Conservation Plan Guidance which can include other measures such as carcass removal and rebuilding at risk utility poles. Staff has considered these actions and incorporated additional recommended language from the CDFW into **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan). This plan requires 5 years of monitoring to ensure risks to eagles and other birds are adequately assessed and mitigated to comply with fully mitigate standards identified by the CDFW. In addition, the plan requires the use of an automated detection and deterrent system designed to minimize the risk of birds that are detected flying through the RSH. This system would proactively be used to reduce the risk of avian collisions as a requirement of operation rather than being used after the fact if high mortality rates are detected.

These systems have been demonstrated to be useful in reducing collision risk. A presentation at the Wind Wildlife Research Meeting (WWRM) titled the "Effectiveness of Radar Assisted Shutdown on Demand of Turbines as a Mitigation Tool to Avoid Soaring Bird Mortality in Wind Farms" concluded that radar-assisted turbine shutdown on demand can be extremely efficient in avoiding collision mortality in areas where such a conflict may emerge, effectively reducing soaring bird mortality rates while incurring negligible production losses. However, Smallwood and Bell (2020) suggested it is likely that some species, such as golden eagle, American kestrel, and fly-catchers, are more vulnerable to a wind turbine's moving blades; thus, some form of turbine shutdown may serve a mitigation function. A few bird species, including American kestrel, are also more vulnerable to open interior spaces on towers or turbines, where they can become entrapped, covered in oil, or injured by heat or moving parts. An operational curtailment strategy might not reduce turbine-caused fatalities for all bird species (Ibid).

In addition, staff proposes to require the use of avian and bat detection dogs to gain a better understanding of the mortality risks associated with the project. The use of dogs in monitoring has been shown to greatly improve the accuracy of searches, particularly for small-bodied animals (Arnett 2006; Paula et al., 2011). In a blind trial, scent detection dogs located 73 percent of bat carcasses, whereas human searchers detected only 20 percent. The Plan would also require the removal of animal carcasses from beneath WTGs and along project access roads and minimize the number of structures such as brush or rock piles that can attract small prey items for golden eagles.

BIO-30 (Implement Seasonal Curtailment) will be required until monitoring or other applicant proposed measures demonstrates that avian and bat use does not pose a risk to the species under specific timing and or weather conditions. The monitoring will be coordinated through **BIO-29** (Implement a Technical Advisory Committee for Avian and Bats) which will assist in reviewing avian mortality data and identify if avoidance and or full mitigation standards for eagles is being achieved. The conditions will provide real-

time avian use data during the construction and initial operation of the project. This information will further inform the CEC and agencies of potential risks not identified during the studies completed for the Shasta County EIR. This data will also allow for a better estimate of Take for bald and golden eagles based on the ECPG guidelines. Recent surveys would ensure that required compensatory mitigation would be implemented prior to operation and funded through a binding agreement with the CEC. The determination of appropriate levels of compensatory mitigation, such as through a resource equivalency analysis is based on two predictions: the level of take expected at a project; and the amount of mitigation required to offset that take.

Based on current take estimates of 1 golden and 1 bald eagle per year the proposed mitigation is expected to be adequate. However, should additional loss occur the Applicant would be required to increase the protective actions and provide additional compensatory measures. Initial impacts from habitat loss habitat loss would be off-set through **FOREST-1** (The project owner shall provide a fee payment to a land trust for the permanent conversion of 510 acres of prime timberland (Site Class I and II) at a one-to-one ratio of equivalent site classification) and **FOREST-2** (The project owner shall reforest the 548 acres of temporarily converted timberlands, including site preparation and planting of conifer seedlings). This may also reduce some of the open space which can be an attractant to golden eagles and other raptors. With the implementation of these measures impacts to bald and golden eagles can be reduced to less than significant and meet CDFW requirements to fully mitigate impacts to golden eagles.

Northern and California Spotted Owl

Significant and Unavoidable Impact.

Basis for Conclusion. For management purposes the USFWS considers Highway 299 to be the boundary between the populations of Northern and California spotted owl. Therefore, all owls south of the 299 are considered California spotted owls. Staff notes that it is likely that Northern spotted owls can move into the project area and could be subject to mortality during the operation of the project. California spotted owls have not been detected nesting on the project site but are known from adjacent locations near the border of the LNF. They have been detected flying through the southern portion of the of the project site and could forage or use the patchwork of remaining trees as dispersal habitat. While this species has a lower potential to collide with WTGs compared to many species, there remains a potential for owls to be lost over the 35-year lifespan of the project. Risk may be higher for birds departing the tall trees that occur in adjacent forest lands because they may be flying within the RSH.

California spotted owls are a species of special concern and are being considered for as a candidate for State listing due to their declining populations, competition with barred owls, and widespread habitat loss due to landscape level wildfires. Because studies have concluded that the population of this species have declined sharply over the last 20 years (USGS, 2018) from a combination of timber harvest, fire suppression activities that promote a higher density of smaller trees that are fire sensitive, which ultimately

increase the risk of high severity fires. Coupled with the expansion of barred owls which compete with this species staff considers the loss even one owl to contribute to the decline of the species on a local and regional scale. Staff has proposed a series of conditions to reduce or minimize impacts to avian species including California spotted owls, however it is uncertain how effective they will be for this nocturnal species over the life of the project. Therefore, even with staff's proposed COCs impacts would be considered significant and unavoidable.

Background and Analysis. For management purposes the USFWS considers Highway 299 to be the boundary between the occurrences of Northern and California spotted owl. Therefore, any spotted owl that is present south of the 299 is considered a California spotted owl and any spotted owl north of the 299 as a Northern spotted owl. While Northern spotted owls may be present to some degree and subject to collision risk with the WTGs, for regulatory purposes they are considered California spotted owls south of Highway 299 and have been excluded from further analysis in this document. Staff notes that it is likely that Northern spotted owls can move into the project area and could be subject to mortality during the operation of the project. California spotted owls have not been detected nesting on the project site but are known from adjacent locations near the border of the LNF. They likely forage to some degree in the project area and can use the area as dispersal habitat.

The project would include 48 wind turbines with maximum tip height of 610 feet above ground surface (abg) and 3 MET towers with heights of up to 394 feet abg located throughout the project site. This species typically forages at night and could fly at high enough elevations if nesting in tall forest trees in adjacent forest lands to encounter any above ground wire or turbine blade but are less likely to collide with the WTG tower. While most of the project area consists of sparse nesting habitat birds would be expected to move through the area.

During three years of avian and bat mortality monitoring for the Hatchet Wind project located just north of the project no Northern or California Spotted Owl mortalities were detected. However, this data while useful may not reflect the risk to owls at the proposed project site due to size and configuration differences between the projects, and the intermittent nature of the monitoring. In addition, the report noted that "at the time of this report, there are no publicly available mortality monitoring studies for wind energy facilities with forested ridge-top habitat in the Western United States; thus, comparisons are made to Western-region facilities" (Tetra Tech, 2014). The 2019 Spotted Owl Risk Assessment (FWPA, TN248307) noted that because operational wind energy projects are sparse within the range of spotted owls, the potential susceptibility of spotted owls to collisions with turbines was evaluated for the congeneric barred owl, which occurs in similar forested habitats but occupies a much larger range across North America. The study found that only four barred owl mortalities out of 20,168 avian fatalities were documented. And that overall other forest dwelling owls accounted for a very low percentage of fatalities. But as previously noted, these numbers may

undercount total fatalities. And while low, the barred owl mortality rate does confirm the risk to the spotted owls is realistic and predictable.

Staff considered this data and concluded that California spotted owls would be subject to mortality from collisions with WTGs, MET towers and any above ground collector or transmission lines during the 35-year life of the project. California spotted owls occur immediately adjacent to the project site and have been documented within 0.3 and less than 1 mile from the southern boundary of the site (FWPA, TN 248309 (2021 surveys) during surveys conducted by the Applicant. This includes historic and activity center (SHA0046) which based on the 2021 nest location, is approximately 0.4 mi (2,000 ft) from the closest project disturbance and an owl was detected at Site SHA0124 approximately 1 mile from the project site (FWPA, TN 249927 Spotted Owl Memo) which is located on the LNF. Supplemental surveys conducted by the Applicant in 2023 found two detections approximately 0.9 and 1.4 mi south of the nearest proposed turbine, respectively (FWPA, TN 253168). Staff believes that even low levels of mortality of this already declining species has the potential to affect local populations and considers impacts to be significant and unavoidable. To reduce potential impacts staff has incorporated mitigation language presented by the Applicant, in the form of further mitigation plans, into **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan). **BIO-30** (Implement Seasonal Curtailment) includes feathering turbines during low wind events at night which may reduce potential collisions should owls be dispersing or foraging across the project area. In addition, **BIO-29** (Implement a Technical Advisory Committee for Avian and Bats) will promote collaboration on other forms of mitigation should California spotted owls be found during the 5-years of avian and bat mortality.

Sandhill Crane

Significant and Unavoidable Impact.

Basis for Conclusion. Greater sandhill cranes are a State Threatened and State fully protected species that were once abundant breeders on the Modoc Plateau of northeastern California. Surveys conducted by the Applicant detected large numbers of sandhill cranes overflying the site during Year 2 avian risk studies. While the birds were not positively identified as the specific State listed/Fully Protected greater sandhill crane species, this species is known to nest 20 miles east of the project site in the Fall River Valley Important Bird Area. In addition, the project area is located immediately adjacent to a known migratory pathway routinely used by greater sandhill cranes as they fly from other states to California's central Valley and other locations. Although there were no sandhill cranes identified during three years of mortality studies at the nearby Hatchet Wind project, staff cannot conclude that this species will not collide with the projects larger WTGs because the birds have been detected overflying the project area in large numbers, the site is located adjacent to a known migratory pathway for GPS tracked birds, and poor weather conditions can and do result in birds flying lower than typically expected during migration. Staff concludes that because these are flocking birds should a collision event occur it would likely result in the loss of multiple birds

which can adversely affect local occurrences. Therefore, staff considers the impacts to be significant and Unavoidable despite the application of staffs recommended COCs.

Background and Analysis. Operation of the project has the potential to result in the loss of greater sandhill cranes which are a State Threatened and State fully protected species. The Shasta County EIR (FWPA, TN 248288-6) noted that sandhill crane injury or mortality from collision with turbine towers, WTGs, and MET towers could occur during construction of these facilities, especially during migration periods when most crane traffic occurs. The document also noted that low-light and poor visibility conditions may be particularly hazardous to migrating cranes and increase the probability of collision with unlit structures. Collisions may also occur as a result of crane interactions with ridgetop power lines.

Staff concurs with the Applicant that the project site does not appear to be located within a daily flight route and migrating cranes are known fly at high altitudes (e.g., 3,000 to 5,000 feet above ground) that are generally above the height of proposed facilities (Johnsgard, 2015). However, staff notes that the project site and broader project area are located at the edge of a known migratory pathway for this species (Donnelly et al 2021.) (see **Figure 5.2-3**). In addition, several hundred sandhill cranes were observed in flight during avian surveys conducted by the Applicant (FWPA, TN 248309-5) but they could not be identified to species. Sandhill cranes are expected to migrate over the project site in the spring and fall. Donnelly et al (2021) also found that GPS tagged cranes also appear to use consistent pathways which increase risk to migrating birds.

The Applicant considers the risk of collision with greater sand hill cranes to be low based on the Hatchet Wind Farm data and several other mortality studies conducted in the United States. For example, no sandhill crane fatalities were documented during the three-year fatality monitoring study at Hatchet Ridge, despite this species recorded flying over the site during pre-construction avian use surveys (Tetra Tech, 2014). In addition, Researchers at WEST monitored use by migrating sandhill cranes at five wind energy facilities in North and South Dakota from 2009 – 2013 for three years at each site. Concurrently, they searched underneath all turbines daily for fatalities of cranes. Cumulatively, observers spent about 13,182 hours recording crane use over 1,305 days, and even though 42,727 sandhill crane observations were recorded, no fatalities of cranes were found beneath turbines (Derby et al. 2018) A crane monitoring study was conducted at the Forward Energy Center, a wind energy facility in southern Wisconsin located within 3.2 km (2.0 miles) of a large wetland used by sandhill cranes. No crane fatalities were found during the crane monitoring study in the fall of 2008, or during regular bird fatality monitoring studies conducted in the fall of 2008, spring and fall of 2009, and in the spring of 2010, even though sandhill cranes were observed in the study area (Grodsky et al. 2013).

Staff acknowledges this data is useful but cautions these studies occur in different locations and is uncertain how turbine heights, location (i.e., flatlands versus

mountainous areas), migratory or daily routes, searcher efficiency or other metrics were implemented. Staff also cautions that monitoring studies are often conducted voluntarily or not at all for some wind farms which may result in underestimates of mortality for some species. Staff notes that of the 27 waterbird fatalities documented at these facilities two American white pelicans and one sandhill crane fatalities were observed. In addition, the tally in WEST's database does not include three sandhill crane fatalities documented in non-standardized fatality surveys at other facilities. These include one fatality at an older-generation facility at Altamont Pass in California (Smallwood and Karas 2009), and two fatalities from a facility in west Texas (Navarrete and Griffis-Kyle 2014; Stehn 2011), documented as part of a wintering crane displacement study conducted by graduate student L. Navarrete of Texas Tech University. Based on three years of avian monitoring that was conducted approximately 10 years ago for a smaller scale project, the presence of the species in the area due to the flyway, a nesting area in the vicinity, and creation of open areas for future stopover roosting habitat within the project site, staff must conclude that sandhill cranes will collide with the WTGs, turbine towers, or MET towers, even with required FAA lighting. In addition, two unidentified crane or rail species were also detected during mortality monitoring at the Hatchet Ridge Windfarm (Tetra Tech, 2014). Therefore, staff cannot conclude that some rare species were not subject to mortality, especially given the diversity of bird species in the region. The number of birds lost, and the frequency of the occurrence remains unknown.

If mortality rates remain low or are limited to single birds every few years it is possible that the impacts to this species could be fully mitigated which is a CDFW requirement for impacts to State listed and fully protected birds under the Fish and Game Code. However, staff notes that even with the use of radar which has been demonstrated to be effective in reducing mortalities and five years of mortality studies proposed in staff's COC it is not possible to ensure impacts to this species would not occur over the 35-year lifespan of the project. Similarly, because these birds are slow to become reproductively active the loss of one or more females could adversely affect crane numbers for several years.

In addition, while greater sandhill crane nesting or stopover roosting habitat is limited within the project site this habitat may expand as vegetation is cleared around access roads and WTG pads which could encourage greater sand hill cranes to pause in the region during migration.

To reduce mortality staff has proposed the same general measures for other birds and raptors including **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan), **BIO-30** (Implement Seasonal Curtailment), and **BIO-23** (Implement a Technical Advisory Committee for Avian and Bats) impacts would likely remain significant and unavoidable for this species. As a component of **BIO-28** the Applicant would be required to fund the enhancement of crane habitat in portions of California or implement measures to reduce predation should the project be approved and commence operation.

Northern Goshawk

Significant and Unavoidable Impact.

Basis for Conclusion. Goshawks are known to occur in the region and were detected within the project area during surveys conducted by the applicant; however, no nesting was observed during surveys conducted in 2021. It is likely that goshawks will continue to overfly the project area and may nest in the densely forested lands adjacent to the project. Although there is little information regarding the risk to goshawks from collisions with windfarms and there were no documented mortalities of this species during three years of mortality monitoring at the adjacent Hatchet Ridge windfarm several raptor species were lost (Tetra Tech, 2014). While the risk may be low these species are present in the region, were observed overflying the area, have the potential to fly with in the rotor sweep area, and could be subject to collision risk. Staff considers it likely that this species will be killed but is not able to estimate the numbers of birds given the limited and dated data. Therefore, staff must assume a worst-case scenario and concludes impacts to this species would be considered significant and Unavoidable even with staff's proposed COC.

Background and Analysis. Goshawks are known to occur in the region and were detected within the project area during fixed-point large bird use surveys and incidentally, totaling six observations between April 2017 and March 2019 (FWPA, TN 248308 Northern Goshawk Memo). Goshawk nest sites have been documented historically within the project area. Broadcast acoustical surveys conducted on June 21-24 and July 12-15, 2021, did not result in any detections of goshawks and no evidence of nesting was observed (FWPA, TN 248308 Northern Goshawk Memo).

The Applicant concluded that during operations, risk to this species may be low because of the small goshawk population in the area which would reduce the risk to this species from collisions with the WWTGs or other facilities. In addition, there were no recorded mortalities during three years of avian mortalities at the Hatchet Wind Farm and no mortality recorded due to wind turbines in California (Tetra Tech, 2014). Staff considered this information and concluded that the lack of data concerning goshawk mortalities may be due to several factors including the limited number of windfarms constructed in occupied goshawk habitat, the short periods of post construction monitoring that is often conducted, and the varied survey intervals that occur during post construction monitoring. It is completely plausible that birds that occur in small numbers could be predated or be killed episodically during post monitoring periods. Staff notes that in general, raptors are susceptible to collisions at windfarms across the United States. Because this species is known to occur in the project area, has historically nested in the project area and has been recorded overflying the site during previous surveys there is a likelihood that this species would be subject to loss from colliding with the WTGs or other facilities. In addition, because this bird may occur in low numbers in the region impacts would be considered significant and unavoidable over the 35-year life of the project.

To reduce mortality risk staff has proposed the same general measures for other birds and raptors including **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan), **BIO-23** (Implement a Technical Advisory Committee for Avian and Bats), and **BIO-30** (Implement Seasonal Curtailment). It is likely the implementation of these measures would reduce risk and could offset impacts to low numbers of birds. In addition, by increasing the period when monitoring occurs, expanding the search area around the turbines, and using searcher dogs', impacts will be better quantified, and the TAC could apply additional measures to reduce those impacts should they exceed mortality thresholds identified in **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan).

Great Gray Owl and California Condor

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Great gray owl is not known to occur in the project area. Suitable old growth timber and associated proximities to adequate foraging habitat is not present but is present on adjacent forest lands. California condors are not currently known from the project area. Nesting habitat for this species is limited and the closest known occurrences occur as an experimental population in the Redwood National Forest. These species would be subject to risk of collision should they occur in the project area. However, they are not expected to be present except for rare occurrences. With the implementation of staff recommended COCs impacts to these species would be reduced to less than significant levels.

Background and Analysis. The risk to these species is low considering the expected distribution of the animals in the region. Neither were detected during avian surveys at the Hatchet Ridge of Fountain Wind farm surveys or during mortality monitoring at the Hatchet Windfarm. Given the current population trends and efforts to re-introduce condors to areas of their formal range and that condors are known to travel over 50 miles during foraging events, condors may visit the project area at least on occasion over the course of the project lifespan. Should they overfly the project site if approved they could be at risk of collisions with the WTGs, MET Towers, and other equipment. They could also be attracted to carcasses of large mammals should they occur in the project area. Great gray owls may also overfly the project area overtime and could be at risk of collision. At this time, the current experimental population of condors is small and not established, but this could change over the 35-year operational life of the project with a larger permanent population of condors.

To reduce risk of collision staff has proposed **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan), **BIO-29** (Implement a Technical Advisory Committee for Avian and Bats), and **BIO-30** (Implement Seasonal Curtailment). These conditions include the use of radar operating curtailment systems which could reduce the risk to a large bird such as a condor. It is likely the implementation of these measures would reduce risk. Staff has also proposed the requirement that an additional two years of avian and bat mortality monitoring be conducted at year 12 of operations.

While staff cannot rule out that either a condor or a great gray owl will be killed during the life of the project impacts would be considered less than significant with mitigation.

Olive-sided flycatcher, Vaux's swift, and Lewis's woodpecker. Willow Flycatcher, yellow-breasted chat, yellow warbler, and other special status birds.

Significant and Unavoidable Impact.

Basis for Conclusion. Each of these birds has either been detected in the project area or is known to occur in the broader region and can be expected to overfly the site. In addition, each of these birds have been documented as mortalities at other windfarms or come from families of birds that are susceptible to collisions.

Background and Analysis. Vaux's swift, yellow warbler, olive-sided flycatcher, and Lewis's woodpecker are California species of special concern and were detected during surveys conducted by the Applicant. The yellow warbler is a migratory species in northern California, with presence in the region during the spring and fall. Willow flycatchers were not detected on the project site, but a large breeding population is known from the region near the Upper McCloud River IBA (FWPA, TN 248318). In addition, virtually any special status bird that that is present in the pacific flyway has some potential to occur during migration including white pelicans, rails, burrowing owls, loggerhead shrikes, white tailed kites, Swainson's hawks, and other rare or sensitive species. Even species not detected during avian point counts could occur over the course of the lifetime of the project. Tricolored blackbirds are known to nest in the valley, while bank swallows, a state threatened species are known to nest along the Pit River (FWPA, TN 248318). These and other species have the potential to overfly the site and are at some risk of collision with the WTGs and MET towers.

Avian monitoring at the Hatchet Ridge Wind farm detected one yellow warbler fatality during year one surveys. That was the only special status bird found during the three years of monitoring. However, of 98 avian fatalities from 39 species that were detected at the project, 42 avian fatalities were not identifiable to species due to the condition of the remains (Tetra Tech, 2014). In addition, two unidentified crane or rail species totaling 5 birds were also detected. Therefore, staff cannot conclude that some rare species were not subject to mortality, especially given the diversity of bird species in the region.

Staff considers it likely that sensitive resident birds and migratory species will collide the WTGs, towers, MET Towers, and other structures throughout the life of the project. Staff is unable to conclude which species will be encountered or in what numbers. This includes willow flycatchers which are known from the region and likely use riparian habitat in the project area during migration. Burrowing owls also may move through this region and have been recorded striking WTGs in other locations. Some resident birds such as Lewis's woodpecker may fly below the RSH but impacts may still occur. Because windfarms are a known source of mortality to a wide variety of birds staff concludes that the impacts would be considered significant and unavoidable.

To reduce risk of collision staff has proposed **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan), **BIO-29** (Implement a Technical Advisory Committee for Avian and Bats), and **BIO-30** (Implement Seasonal Curtailment). These conditions include the use of radar operating curtailment systems which could reduce the risk of collision. It is likely the implementation of these measures would reduce risk. Staff considers these measures to be important to reducing and assessing risk to a variety of sensitive birds that have the potential to fly through the project site over the life of the project. Implementation of **FOREST-1** would require the project owner to provide a fee payment to a land trust for the permanent conversion of 510 acres of prime timberland (Site Class I and II) at a one-to-one ratio of equivalent site classification. **FOREST-2** would require the project owner to reforest the 548 acres of temporarily converted timberlands, including site preparation and planting of conifer seedlings. These impacts would help offset habitat loss and mortality to a variety of forest dwelling birds.

Common and Sensitive Bats

Significant and Unavoidable Impact.

Basis for Conclusion. Common and sensitive bats are especially at risk of collisions or injury with WTGs. In the United States wind energy generation in 2012 was estimated to have killed 600,000 (Hayes, 2013) to 888,000 bats (Smallwood, 2013). Because installed wind energy capacity in the United States doubled from 2012 to 2020, bird and bat fatalities likely also increased (Ibid). Operation of the project is expected to continue this trend and result in the ongoing loss of large numbers of migratory bats. Staff has proposed several COCs including feathering turbines and seasonal curtailment which has been demonstrated to reduce bat fatalities, but impacts would remain significant and unavoidable.

Background and Analysis. Seventeen bat species have the potential to occur within the project site. Some of these include silver-haired, Brazilian free-tailed, hoary, big brown spotted bat, western mastiff bat, pallid bat, western red bat, hoary bat, Townsend's big-eared bat, long-eared myotis, fringed myotis, and Yuma myotis. Five of these species are considered species of special concern by the CDFW. Fourteen bat species were documented from acoustic survey data collected by the Applicant within the project area, including two California species of special concern: spotted bat, and western mastiff bat. It has been generally presumed that pre-construction bat activity rates are positively related to post-construction bat fatalities; however, to date, the relationship between pre-construction activity rates and post-construction fatality rates has not been established (FWPA, TN 248307). Similarly, bats do not always echolocate, and some species are difficult to detect. Hoary bats may not echolocate 50% of the time and may be detectable only 10% of the time (Corcoran and Weller 2018). Some species may also be attracted to turbines, so that activity patterns may change once turbines are built.

Bat fatality rates were documented at the nearby Hatchet Ridge Wind project, which has been in operation since 2010. Over three years of monitoring, a total of 63 bat fatalities were found from four species (silver-haired, Brazilian free-tailed, hoary, and big brown). Estimated annual bat fatality rates ranged from 5.13 to 12.02 bats/turbine/year of predominantly hoary, silver-haired, and Mexican free-tailed during their late summer/fall migration period (Tetra Tech, 2014). If we assume these rates are accurate and apply these rates to the Fountain Wind projects 48 WTGs, we find that between 8,618.4 to 20,194 bats would be killed in 35 years assuming there is no variation in bat use between the sites.

- Bats 5.13 bats/turbine to 12.02 bats/turbine. Therefore, 48*5.13=264.2/year for FW or 8,618.4 in 35 years to 48*12.02=577/year or 20,194 bats in 35 years.

Staff considers these impacts to contribute to the ongoing loss of bats across the United States. A review of the WWRM presentation Landscape Features Associated with Hoary Bat Fatalities at Wind Energy Facilities Presenter: Erin Baerwald, University of Regina, noted that “currently, fatalities at wind energy facilities are one of the greatest known sources of mortality for migratory bats. Between 840,000 and 1.7 million bats are estimated to have been killed by wind turbines in the US and Canada from 2000-2011, and several hundred thousand fatalities are estimated to occur annually. Of these fatalities, approximately 72% are of three species of migratory tree-roosting bats: hoary bats, eastern red bats, and silver-haired bats. Recent analyses suggest that fatalities at wind energy facilities are negatively affecting populations of hoary bat, which are thought to make up about 32% of wind energy-related bat fatalities.” As noted in this and other reports silver-haired and hoary bats were some of the most killed bats at Hatchet Ridge. Staff considers it likely that due to the many small streams, creeks, and small wet meadows that occur in the project area bats would be killed in higher numbers overall compared to Hatchet Wind as migratory bats move through and forage in the area. Impacts would be considered significant and unavoidable to the ongoing loss of bats.

To reduce risk of collision staff has proposed **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan), **BIO-29** (Implement a Technical Advisory Committee for Avian and Bats), and **BIO-30** (Implement Seasonal Curtailment). Seasonal curtailment has been demonstrated to be an effective tool in reducing bat mortality at windfarms in California. Smallwood and Bell (2020) found that wind turbine curtailment significantly reduced near-misses and rotor-disrupted flights of bats, and it significantly reduced fatalities of bats but did not have the same effect for birds. They concluded that because the migration season is relatively brief, seasonal curtailment would greatly reduce bat fatalities for a slight loss in annual energy generation, but it might not benefit many bird species. Staff concurs and bat mortality at the adjacent Hatched Wind Farm was found to be low during winter months when most bats are inactive in the project area. Feathering turbines during low wind speeds may also be useful but would not be expected to reduce mortality rates compared to full curtailment when sensitive bats are migrating though the area. In addition, through the TAC if

mortalities exceed thresholds additional measures such as the use of bat deterrents which have demonstrated to be effective for some species of bats including hoary bats which are present in the project area.

c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Riparian habitats drive food webs, provide seeds for regeneration, habitat for wildlife, access to water, and create cooler, more hospitable microclimatic conditions essential for many plant and animal species.

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Construction of the project has the potential to result in temporary and permanent impacts to a variety of ephemeral, intermittent, and perennial drainages. Many of these drainages would be considered jurisdictional by the USACE, RWQCB, and the CDFW. Impacts to these waters can be mitigated by staffs proposed COCs which include numerous measures to protect water quality, sensitive aquatic resources, and ensure that all temporary and permanent impacts are mitigated either through restoration or compensatory land acquisition. In addition, the COCs identified by staff were developed in coordination with the CDFW to ensure they meet LSAA requirements. The Applicant will also have to obtain permits from the RWQCB and the USACE. With the implementation of staffs COCs impacts would be reduced to less than significant levels.

Background and Analysis. There are numerous waterways in the project Area including unnamed drainages and wetlands as well as several named drainages, including Richardson Creek, Little Hatchet Creek, Hatchet Creek, Carberry Creek, Goat Creek, North Fork Montgomery Creek, Indian Spring, South Fork Montgomery Creek, Cedar Creek, North Fork Little Cow Creek, Little Cow Creek, and Mill Creek. Stantec biologists mapped 41 ephemeral stream segments, 110 intermittent stream segments, and 109 perennial stream segments within the survey area (FWPA, TN 248329-4). In addition, 21 non-vegetated ditch segments within the survey area and three ponds were present.

A jurisdictional delineation was conducted by Stantec in 2019 (FWPA, TN 248329-4). This document included areas north of Highway 299 which are not included in the current project description for the project. The Applicant provided updated maps of proposed disturbance areas and a table of jurisdictional features that would be subject to temporary and permanent impacts (see FWPA, TN 248329-4). During a site visit conducted by staff it is not clear if the survey delineated the boundaries of CDFW jurisdictional habitats or used vegetation as a proxy for CDFW jurisdictional habitat. In

addition, during the one-day reconnaissance level survey conducted by staff in November 2024, staff noted that a variety of vegetated and unvegetated swales, ditches and other features may not have been included in the initial delineation completed by Stantec in 2019. It is possible these features were assessed and dismissed however that information was not found in a review of the applicant's technical documents. It was noted that in the Stantec document the survey focused on classifying aquatic habitats following A Guide to Wildlife Habitats of California, an older and more general classification system (Mayer and Laudenslayer, 1988) (FWPA, TN 248329-4).

Direct and Indirect Impacts. Direct and indirect impacts would occur from the construction of stream crossings filling and grading from new road construction, widening existing access roads, installing, or replacing existing culverts, and placement of staging areas.

The project would require road crossings at approximately 32 streams. Twenty-four new road crossings would be required, including 5 perennial streams, 12 ephemeral and intermittent streams and 7 non-vegetated ditches. Eight crossings would occur where there are existing roads and crossings, which may require improvement or replacement. These include 3 perennial streams and 5 ephemeral and intermittent streams.

Based on information provided by the Applicant construction of the project would result in 7.5 acres of permanent impacts to Mixed Montane Riparian Forest, 7.3 acres of permanent impacts to Mixed Montane Riparian Scrub, 0.03 acres of permanent impacts to Montane Meadow, and 0.4 acres of permanent impacts to Wet Montane Meadow. Staff assumes that these are considered jurisdictional by the CDFW and other agencies.

Table 5.2-7 (Potential Jurisdictional Features Impacted by the Proposed Project) provides a concise breakdown of the drainage type and expected jurisdiction. Impacts to these features would be considered a significant impact. Permanent impacts would also occur to these features and include direct loss of wetland meadows, seeps, and springs.

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
1	CV49	34	63.86		Temporary Impacts	Culvert	AccessRoad/UGE	16	12	PermVeg		x	x
Total Permanent Impacts to Culvert			**0**	**0**							**0**	**0**	**0**
Total Temporary Impacts to Culvert			**63.86**	**0.00146602**							**0**	**1**	**1**
2	ES21	13	50.99		Temporary Impacts	Ephemeral Stream	UGE	112	2	TempNo		x	x
3	ES24	27	324.00		Temporary Impacts	Ephemeral Stream	AccessRoad/UGE	686	5	TempNo		x	x
4a	ES25	28	83.39		Temporary Impacts	Ephemeral Stream	AccessRoad/UGE	303	5	TempNo		x	x
4b	ES25	28	102.05		Perm Impacts	Ephemeral Stream	AccessRoad/UGE	303	5	PermImperv		x	x
5a	ES26	29	936.47		Temporary Impacts	Ephemeral Stream	AccessRoad/UGE	1025	4	TempNo		x	x
5b	ES26	29	357.81		Perm Impacts	Ephemeral Stream	AccessRoad/UGE	1025	4	PermImperv		x	x
6a	ES28	30	1,871.15		Temporary Impacts	Ephemeral Stream	AccessRoad/UGE	956	3	TempNo		x	x
6b	ES28	30	613.95		Perm Impacts	Ephemeral Stream	AccessRoad/UGE	956	3	PermImperv		x	x
7a	ES32	45	125.61		Temporary Impacts	Ephemeral Stream	AccessRoad/UGE	111	17	TempNo		x	x
7b	ES32	45	75.11		Perm Impacts	Ephemeral Stream	AccessRoad/UGE	111	17	PermImperv		x	x
8a	ES33	45	254.16		Temporary Impacts	Ephemeral Stream	AccessRoad/UGE	148	17	TempNo		x	x
8b	ES33	45	150.38		Perm Impacts	Ephemeral Stream	AccessRoad/UGE	148	17	PermImperv		x	x
Total Permanent Impacts to Ephemeral Stream			**1,299.3**	**0.02982782**							**0**	**5**	**5**

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
Total Temporary Impacts to Ephemeral Stream			**3,645.77**	**0.08369536**							**0**	**7**	**7**
9	FEW2	39	307.68		Perm Impacts	Fresh Emergent Wetland	Access Road	56	7	PermFill	x	x	
Total Permanent Impacts to Fresh Emergent Wetland			**307.68**	**0.00706336**							**1**	**1**	**0**
Total Temporary Impacts to Fresh Emergent Wetland			**0**	**0**							**0**	**0**	**0**
10	E2	50	53.61		Temporary Impacts	Intermittent	OHE	14	19	TempNo	x	x	x
11	F1	50	102.57		Temporary Impacts	Intermittent	OHE	18	19	TempNo	x	x	x
12a	G1	50	1,935.56		Temporary Impacts	Intermittent	OHE	181	19	TempNo	x	x	x
12b	G1	50	967.91		Perm Impacts	Intermittent	OHE	97	19	TempNo	x	x	x
13a	H1	50	81.38		Temporary Impacts	Intermittent	OHE	41	19	TempNo	x	x	x
13b	H1	50	54.19		Perm Impacts	Intermittent	OHE	34	19	TempNo	x	x	x
14a	I 1	50	27.90		Temporary Impacts	Intermittent	OHE	28	19	TempNo	x	x	x
14b	I 1	50	16.90		Perm Impacts	Intermittent	OHE	18	19	TempNo	x	x	x
15a	N	25	490.35		Temporary Impacts	Intermittent	Access Road	82	6	TempNo	x	x	x
15b	N	25	329.59		Perm Impacts	Intermittent	Access Road	55	6	PermImperv	x	x	x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
16a	P1	41	311.81		Temporary Impacts	Intermittent	UGE	52	15	TempNo	x	x	x
16b	P1	41	212.24		Perm Impacts	Intermittent	UGE	35	15	PermFill	x	x	x
17	P2	41	43.97		Temporary Impacts	Intermittent	UGE	22	15	TempNo	x	x	x
18	P3	41	61.69		Temporary Impacts	Intermittent	UGE	10	15	TempNo	x	x	x
Total Permanent Impacts to Intermittent			**1,580.83**	**0.03629086**							**5**	**5**	**5**
Total Temporary Impacts to Intermittent			**3,108.84**	**0.07136915**							**9**	**9**	**9**
19a	IS37	16	438.73		Temporary Impacts	Intermittent Stream	UGE	344	1	TempNo	x	x	x
19b	IS37	16	78.24		Perm Impacts	Intermittent Stream	UGE	344	1	TempNo	x	x	x
20	IS38	16	339.50		Temporary Impacts	Intermittent Stream	UGE	253	1	TempNo	x	x	x
21a	IS39	16	1,213.15		Temporary Impacts	Intermittent Stream	UGE	211	1	TempNo	x	x	x
21b	IS39	16	44.85		Perm Impacts	Intermittent Stream	UGE	211	1	TempNo	x	x	x
22a	IS41	16	146.54		Temporary Impacts	Intermittent Stream	UGE	178	1	TempNo	x	x	x
22b	IS41	16	127.92		Perm Impacts	Intermittent Stream	UGE	178	1	TempNo	x	x	x
23	IS42	16	41.92		Temporary Impacts	Intermittent Stream	UGE	127	1	TempNo	x	x	x
24a	IS43	16	214.42		Temporary Impacts	Intermittent Stream	UGE	236	1	TempNo	x	x	x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
24b	IS43	16	20.09		Perm Impacts	Intermittent Stream	UGE	236	1	TempNo	x	x	x
25a	IS45	27	124.84		Temporary Impacts	Intermittent Stream	AccessRoad/UGE	240	5	TempNo	x	x	x
25b	IS45	27	77.35		Perm Impacts	Intermittent Stream	AccessRoad/UGE	240	5	PermFill	x	x	x
26	IS46	27	29.24		Temporary Impacts	Intermittent Stream	AccessRoad/UGE	235	5	TempNo	x	x	x
27a	IS48	13	108.27		Temporary Impacts	Intermittent Stream	UGE	232	2	TempNo	x	x	x
27b	IS48	13	74.36		Perm Impacts	Intermittent Stream	UGE	232	2	TempNo	x	x	x
28	IS49	13	113.85		Temporary Impacts	Intermittent Stream	UGE	112	2	TempNo	x	x	x
29a	IS51	31	994.61		Temporary Impacts	Intermittent Stream	OHE	31	13	TempNo	x	x	x
29b	IS51	31	979.66		Perm Impacts	Intermittent Stream	OHE	31	13	TempNo	x	x	x
30	IS65	41	113.42		Temporary Impacts	Intermittent Stream	AccessRoad/UGE	171	15	TempNo	x	x	x
31	IS69	41	37.97		Temporary Impacts	Intermittent Stream	AccessRoad/UGE	164	15	TempNo	x	x	x
32a	IS88	50	387.51		Temporary Impacts	Intermittent Stream	Access Road	180	19	TempNo	x	x	x
32b	IS88	50	173.27		Perm Impacts	Intermittent Stream	Access Road	180	19	PermImperv	x	x	x
33a	IS89	50	736.09		Temporary Impacts	Intermittent Stream	Access Road	128	19	TempNo	x	x	x
33b	IS89	50	556.49		Perm Impacts	Intermittent Stream	Access Road	128	19	PermImperv	x	x	x
34a	IS90	50	82.92		Temporary Impacts	Intermittent Stream	Access Road	79	19	TempNo	x	x	x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
34b	IS90	50	46.08		Perm Impacts	Intermittent Stream	Access Road	79	19	TempNo	x	x	x
Total Permanent Impacts to Intermittent Stream			**2,178.31**	**0.05000712**							**10**	**10**	**10**
Total Temporary Impacts to Intermittent Stream			**5,122.98**	**0.11760744**							**16**	**16**	**16**
35a	NVD13	26	340.41		Temporary Impacts	Non-Vegetated Ditch	Access Road	327	6	TempNo		x	
35b	NVD13	26	125.90		Perm Impacts	Non-Vegetated Ditch	Access Road	327	6	PermImperv		x	
36a	NVD14	26	48.89		Temporary Impacts	Non-Vegetated Ditch	Access Road	190	6	TempNo		x	
36b	NVD14	26	65.82		Perm Impacts	Non-Vegetated Ditch	Access Road	190	6	PermImperv		x	
37a	NVD15	27	372.43		Temporary Impacts	Non-Vegetated Ditch	AccessRoad/UGE	170	5	TempNo	x	x	
37b	NVD15	27	32.12		Perm Impacts	Non-Vegetated Ditch	AccessRoad/UGE	170	5	PermFill	x	x	
38	NVD16	14	68.16		Temporary Impacts	Non-Vegetated Ditch	UGE	80	2	TempNo	x	x	
39	NVD17	42	113.03		Temporary Impacts	Non-Vegetated Ditch	UGE	38	15	TempNo	x	x	

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
40a	NVD19	46	110.62		Temporary Impacts	Non-Vegetated Ditch	AccessRoad/UGE	477	17	TempNo	x	x	
40b	NVD19	46	581.82		Perm Impacts	Non-Vegetated Ditch	AccessRoad/UGE	477	17	PermImperv	x	x	
Total Permanent Impacts to Non-Vegetated Ditch			**805.66**	**0.01849541**							**2**	**4**	**0**
Total Temporary Impacts to Non-Vegetated Ditch			**1,053.54**	**0.02418595**							**4**	**6**	**0**
41a	A	38	5,411.71		Temporary Impacts	Perennial	Access Road	154	8	TempNo	x	x	x
41b	A	38	4,349.61		Perm Impacts	Perennial	Access Road	120	8	TempNo	x	x	x
42a	A1	36	3,262.03		Temporary Impacts	Perennial	AccessRoad/UGE	81	10	TempNo	x	x	x
42b	A1	36	4,078.62		Perm Impacts	Perennial	AccessRoad/UGE	102	10	PermImperv	x	x	x
43	D1	49	136.81		Temporary Impacts	Perennial	OHE	14	18	TempNo	x	x	x
44a	J	37	22.36		Temporary Impacts	Perennial	UGE	31	9	TempNo	x	x	x
44b	J	37	42.89		Perm Impacts	Perennial	UGE	57	9	TempNo	x	x	x
45a	K	37	15.95		Temporary Impacts	Perennial	UGE	22	9	TempNo	x	x	x
45b	K	37	0.60		Temporary Impacts	Perennial	UGE	0	9	TempNo	x	x	x
46a	M	37	91.09		Temporary Impacts	Perennial	UGE	22	9	TempNo	x	x	x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
46b	M	37	71.26		Perm Impacts	Perennial	UGE	18	9	TempNo	x	x	x
47a	S	43	658.40		Temporary Impacts	Perennial	OHE	82	18	TempNo	x	x	x
47b	S	43	645.36		Perm Impacts	Perennial	OHE	81	18	TempNo	x	x	x
Total Permanent Impacts to Perennial			**9,187.74**	**0.21092149**							**5**	**5**	**5**
Total Temporary Impacts to Perennial			**9,598.95**	**0.22036187**							**8**	**8**	**8**
48a	PS34	39	253.14		Temporary Impacts	Perennial Stream	Access Road	312	7	TempNo	x	x	x
48b	PS34	39	57.93		Perm Impacts	Perennial Stream	Access Road	312	7	PermFill	x	x	x
49	PS35	39	312.66		Perm Impacts	Perennial Stream	Access Road	50	7	PermImperv	x	x	x
50a	PS36	39	31.74		Temporary Impacts	Perennial Stream	Access Road	55	7	TempNo	x	x	x
50b	PS36	39	132.40		Perm Impacts	Perennial Stream	Access Road	55	7	PermFill	x	x	x
51	PS37	39	66.58		Temporary Impacts	Perennial Stream	Access Road	47	7	TempNo	x	x	x
52a	PS53	17	387.74		Temporary Impacts	Perennial Stream	UGE	431	2	TempNo	x	x	x
52b	PS53	17	131.10		Perm Impacts	Perennial Stream	UGE	431	2	TempNo	x	x	x
53	PS55	14	18.71		Temporary Impacts	Perennial Stream	UGE	35	2	TempNo	x	x	x
54	PS56	14	375.39		Temporary Impacts	Perennial Stream	UGE	218	2	TempNo	x	x	x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
55a	PS58	32	1,471.82		Temporary Impacts	Perennial Stream	OHE	301	14	TempNo	x	x	x
55b	PS58	32	1,452.59		Perm Impacts	Perennial Stream	OHE	301	14	TempNo	x	x	x
56	PS59	33	1,559.55		Temporary Impacts	Perennial Stream	AccessRoad/UGE	253	14	TempNo	x	x	x
57a	PS61	33	969.05		Temporary Impacts	Perennial Stream	AccessRoad/UGE	396	14	TempNo	x	x	x
57b	PS61	33	861.86		Perm Impacts	Perennial Stream	AccessRoad/UGE	396	14	PermImperv	x	x	x
58a	PS66	48	563.31		Temporary Impacts	Perennial Stream	AccessRoad/UGE	78	16	TempNo	x	x	x
58b	PS66	48	372.05		Perm Impacts	Perennial Stream	AccessRoad/UGE	78	16	PermFill	x	x	x
59a	PS67	48	991.38		Temporary Impacts	Perennial Stream	AccessRoad/UGE	89	16	TempNo	x	x	x
59b	PS67	48	577.53		Perm Impacts	Perennial Stream	AccessRoad/UGE	89	16	PermFill	x	x	x
60a	PS68	49	816.00		Temporary Impacts	Perennial Stream	Access/OH	183	18	TempNo	x	x	x
60b	PS68	49	338.49		Perm Impacts	Perennial Stream	Access/OH	183	18	PermFill	x	x	x
61	PS69	49	574.48		Perm Impacts	Perennial Stream	Access/OH	47	18	PermImperv	x	x	x
62	PS70	49	982.28		Perm Impacts	Perennial Stream	Access/OH	122	18	PermImperv	x	x	x
63a	PS71	49	344.69		Temporary Impacts	Perennial Stream	Access/OH	95	18	TempNo	x	x	x
63b	PS71	49	590.44		Perm Impacts	Perennial Stream	Access/OH	95	18	PermFill	x	x	x
64a	PS74	44	374.46		Perm Impacts	Perennial Stream	Access Road	407	17	PermFill	x	x	x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
64b	PS74	44	757.78		Temporary Impacts	Perennial Stream	Access Road	407	17	TempNo	x	x	x
64c	PS74	44	757.78		Temporary Impacts	Perennial Stream	Access Road	407	17	PermFill	x	x	x
65a	PS75	44	187.20		Temporary Impacts	Perennial Stream	Access Road	33	17	PermFill	x	x	x
65b	PS75	44	413.15		Perm Impacts	Perennial Stream	Access Road	33	17	PermFill	x	x	x
66a	PS76	44	512.32		Perm Impacts	Perennial Stream	Access Road	288	17	PermFill	x	x	x
66b	PS76	44	344.09		Temporary Impacts	Perennial Stream	Access Road	288	17	PermFill	x	x	x
66c	PS76	44	344.09		Temporary Impacts	Perennial Stream	Access Road	288	17	TempNo	x	x	x
Total Permanent Impacts to Perennial Stream			**7,683.74**	**0.1763944**							**15**	**15**	**15**
Total Temporary Impacts to Perennial Stream			**10,240.04**	**0.23507897**							**18**	**18**	**18**
67	PON2	42	330.37		Temporary Impacts	Pond	UGE	N/A	15	TempNo	x	x	x
68a	PON3	42	1,343.00		Temporary Impacts	Pond	UGE	N/A	15	PermVeg	x	x	x
68b	PON3	42	116.69		Perm Impacts	Pond	UGE	N/A	15	PermFill	x	x	x
Total Permanent Impacts to Pond			**116.69**	**0.00267883**									
Total Temporary Impacts to Pong			**1,673.37**	**0.03841529**									
69a	RW1	38	12,995.64		Temporary Impacts	Riparian Wetland	OHE	N/A	8	PermVeg	x		x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
69b	RW1	38	16,262.39		Perm Impacts	Riparian Wetland	OHE	N/A	8	PermVeg	x		x
70a	RW5	36	1,368.58		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	10	TempNo	x		x
70b	RW5	36	480.67		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	10	PermImperv	x		x
71	RW6	36	149.44		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	10	TempNo	x		x
72	RW8	49	657.45		Temporary Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
73a	RW50	25	3,980.68		Temporary Impacts	Riparian Wetland	Access Road	N/A	6	PermVeg	x		x
73b	RW50	25	1,705.65		Perm Impacts	Riparian Wetland	Access Road	N/A	6	PermFill	x		x
74a	RW100	44	785.01		Temporary Impacts	Riparian Wetland	Access Road	N/A	17	PermVeg	x		x
74b	RW100	44	130.66		Perm Impacts	Riparian Wetland	Access Road	N/A	17	PermFill	x		x
75a	RW101	44	928.63		Temporary Impacts	Riparian Wetland	Access Road	N/A	17	PermVeg	x		x
75b	RW101	44	556.00		Perm Impacts	Riparian Wetland	Access Road	N/A	17	PermFill	x		x
76a	RW102	44	1,954.13		Temporary Impacts	Riparian Wetland	Access Road	N/A	17	PermVeg	x		x
76b	RW102	44	576.88		Perm Impacts	Riparian Wetland	Access Road	N/A	17	PermFill	x		x
77a	RW103	44	460.48		Temporary Impacts	Riparian Wetland	Access Road	N/A	17	PermVeg	x		x
77b	RW103	44	233.88		Perm Impacts	Riparian Wetland	Access Road	N/A	17	PermFill	x		x
78a	RW47	39	11,386.06		Temporary Impacts	Riparian Wetland	Access Road	N/A	7	PermVeg	x		x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
78b	RW47	39	7,565.18		Perm Impacts	Riparian Wetland	Access Road	N/A	7	PermImperv	x		x
79	RW61	14	33.52		Temporary Impacts	Riparian Wetland	UGE	N/A	2	TempNo	x		x
80	RW63	14	262.06		Temporary Impacts	Riparian Wetland	UGE	N/A	2	TempNo	x		x
81	RW64	14	297.12		Temporary Impacts	Riparian Wetland	UGE	N/A	2	TempNo	x		x
82a	RW65	34	21,136.22		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	12	PermVeg	x		x
82b	RW65	34	393.56		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	12	PermImperv	x		x
83a	RW74	42	2,158.74		Temporary Impacts	Riparian Wetland	UGE	N/A	15	PermVeg	x		x
83b	RW74	42	1,397.79		Perm Impacts	Riparian Wetland	UGE	N/A	15	PermFill	x		x
84	RW75	42	52.30		Temporary Impacts	Riparian Wetland	UGE	N/A	15	PermVeg	x		x
85a	RW76	32	382.47		Temporary Impacts	Riparian Wetland	OHE	N/A	14	PermVeg	x		x
85b	RW76	32	392.68		Perm Impacts	Riparian Wetland	OHE	N/A	14	PermVeg	x		x
86a	RW77	32	765.94		Temporary Impacts	Riparian Wetland	OHE	N/A	14	PermVeg	x		x
86b	RW77	32	693.68		Perm Impacts	Riparian Wetland	OHE	N/A	14	PermVeg	x		x
87a	RW78	33	445.92		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermVeg	x		x
87b	RW78	33	162.81		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermImperv	x		x
88a	RW80	33	441.65		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermVeg	x		x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
88b	RW80	33	180.41		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermImperv	x		x
89a	RW81	33	1,361.19		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermVeg	x		x
89b	RW81	33	29.10		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermFill	x		x
90a	RW82	33	1,270.28		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermVeg	x		x
90b	RW82	33	164.87		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	14	PermFill	x		x
91a	RW83	34	88.21		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	12	TempNo	x		x
91b	RW83	34	41.38		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	12	PermFill	x		x
92a	RW85	48	599.22		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermVeg	x		x
92b	RW85	48	502.20		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermFill	x		x
93a	RW87	48	1,881.44		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermVeg	x		x
93b	RW87	48	996.31		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermFill	x		x
94	RW88	48	643.11		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermVeg	x		x
95a	RW90	48	750.01		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermVeg	x		x
95b	RW90	48	63.81		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermFill	x		x
96a	RW91	48	655.61		Temporary Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermVeg	x		x
96b	RW91	48	257.04		Perm Impacts	Riparian Wetland	AccessRoad/UGE	N/A	16	PermFill	x		x

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
97a	RW92	49	915.20		Temporary Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
97b	RW92	49	261.54		Perm Impacts	Riparian Wetland	OHE	N/A	18	PermFill	x		x
98a	RW93	49	1,684.86		Temporary Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
98b	RW93	49	799.04		Perm Impacts	Riparian Wetland	OHE	N/A	18	PermFill	x		x
99a	RW94	49	393.95		Temporary Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
99b	RW94	49	1,818.98		Perm Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
100a	RW95	49	624.19		Temporary Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
100b	RW95	49	1,024.39		Perm Impacts	Riparian Wetland	OHE	N/A	18	PermVeg	x		x
101	RW96	44	2.87		Temporary Impacts	Riparian Wetland	Access Road	N/A	17	PermVeg	x		x
Total Permanent Impacts to Riparian Wetland			**36,690.9**	**0.84230716**							**25**	**0**	**25**
Total Temporary Impacts to Riparian Wetland			**71,512.18**	**1.64169376**							**33**	**0**	**33**
102	SW4	27	120.67		Temporary Impacts	Seasonal Wetland	AccessRoad/UGE	N/A	5	TempNo	x	x	
Total Impacts to Permanent Impacts			**0**	**0**							**0**	**0**	**0**
Total Impacts to Temporary Impacts			**120.67**	**0.0027702**							**1**	**1**	**0**
103a	VD7	42	10.62		Temporary Impacts	Vegetated Ditch	UGE	59	15	PermFill	x	x	

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
103b	VD7	42	107.46		Perm Impacts	Vegetated Ditch	UGE	59	15	PermFill	x	x	
Total Permanent Impacts to Vegetated Ditch			**107.46**	**0.00246694**							**1**	**1**	**0**
Total Temporary Impacts to Vegetated Ditch			**10.62**	**0.0002438**							**1**	**1**	**0**
104a	WM2	37	1,435.57		Temporary Impacts	Wetland Meadow	UGE	N/A	9	TempNo	x	x	
104b	WM2	37	1,401.18		Perm Impacts	Wetland Meadow	UGE	N/A	9	TempNo	x	x	
105a	WM3	37	354.51		Temporary Impacts	Wetland Meadow	UGE	N/A	9	TempNo	x	x	
105b	WM3	37	205.70		Perm Impacts	Wetland Meadow	UGE	N/A	9	TempNo	x	x	
106	WM4	39	239.09		Temporary Impacts	Wetland Meadow	Access Road	N/A	7	TempNo		x	
107	WM5	39	148.82		Temporary Impacts	Wetland Meadow	Access Road	N/A	7	TempNo	x	x	
108a	WM8	35	16,576.52		Temporary Impacts	Wetland Meadow	AccessRoad/UGE	N/A	11	TempNo	x	x	
108b	WM8	34	8,191.58		Perm Impacts	Wetland Meadow	AccessRoad/UGE	N/A	12	PermImperv	x	x	
108c	WM8	34	874.29		Temporary Impacts	Wetland Meadow	AccessRoad/UGE	N/A	12	TempNo	x	x	
108d	WM8	34	3,044.16		Temporary Impacts	Wetland Meadow	AccessRoad/UGE	N/A	12	TempNo	x	x	
Total Permanent Impacts to Wetland Meadow			**9,798.46**	**0.22494169**							**3**	**3**	**0**

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
Total Impacts to Temporary Impacts Wetland Meadow			**22,672.96**	**0.52049954**							**6**	**7**	**0**
109	SSW13	14	157.75		Temporary Impacts	Wetland Seep/Spring	UGE	49	2	TempNo		x	
110a	SSW14	15	141.24		Temporary Impacts	Wetland Seep/Spring	UGE	72	1	TempNo		x	
110b	SSW14	15	2.43		Perm Impacts	Wetland Seep/Spring	UGE	72	1	TempNo		x	
111	SSW15	42	222.94		Temporary Impacts	Wetland Seep/Spring	UGE	0	15	PermVeg	x	x	
112a	SSW16	44	95.95		Temporary Impacts	Wetland Seep/Spring	Access Road	173	17	TempNo	x	x	
112b	SSW16	44	428.60		Perm Impacts	Wetland Seep/Spring	Access Road	173	17	PermImperv	x	x	
113a	SSW17	46	121.94		Temporary Impacts	Wetland Seep/Spring	AccessRoad/UGE	99	17	TempNo	x	x	
113b	SSW17	46	162.94		Perm Impacts	Wetland Seep/Spring	AccessRoad/UGE	99	17	PermFill	x	x	
114	SSW19	47	218.60		Perm Impacts	Wetland Seep/Spring	AccessRoad/UGE	0	17	PermFill		x	
115	SSW20	47	156.86		Temporary Impacts	Wetland Seep/Spring	AccessRoad/UGE	0	17	PermVeg		x	

TABLE 5.2-7 POTENTIAL JURISDICTIONAL FEATURES IMPACTED BY THE PROPOSED PROJECT

ID	Label	Crossing ID	SqFt	Acres	LAYER	Resource Type	Project Comp	Length_LF	Map book Page	Impact Type	USACE	RWQCB	CDFW
116	SSW21	47	85.34		Temporary Impacts	Wetland Seep/Spring	AccessRoad/UGE	49	17	PermVeg		x	
117	SSW22	47	72.19		Perm Impacts	Wetland Seep/Spring	AccessRoad/UGE	35	17	PermFill		x	
118	SSW23	47	170.63		Perm Impacts	Wetland Seep/Spring	AccessRoad/UGE	0	17	PermFill		x	
119	SSW8	14	97.02		Temporary Impacts	Wetland Seep/Spring	UGE	95	1	TempNo		x	
Total Permanent Impacts to Wetland Seep/Spring			**1,055.39**	**0.02422842**							**2**	**6**	**0**
Total Temporary Impacts to Wetland Seep/Spring			**1,079.04**	**0.02477135**							**3**	**8**	**0**

Direct impacts to state and federal waters and wetlands would include the removal of native riparian vegetation, degradation of water quality from increased erosion and sedimentation, and exposure to herbicides or other hazardous materials. The development of new road crossings, culverts, or at grade crossings can result in numerous impacts to the stream channel if not engineered correctly and sized to accommodate the 100-year storm event. New culverts can pose barriers to fish passage, if not installed properly and are subject to clogging with woody debris and sediment during large storm events. At grade crossings are often associated with head cutting and downstream channel erosion resulting in permanent barriers to fish and aquatic species passage. Clearing vegetation to support construction in riparian areas and adjacent uplands increases the risk of off-site sediment transport and provides mechanisms for herbicides and other hazardous materials to enter stream systems. Refueling equipment near streams can also result spills or direct contact with fuel, oils, lubricants, and hydraulic fluid. Dust palliatives can also degrade streams if they applied within watercourses.

Direct impacts to drainages can also occur should concrete be used or poured for footings, bridge piers, or tower pads near surface water. Poured concrete or grout that enters water can alter water chemistry and result in deleterious impacts to aquatic organisms. This can occur if concrete is poured during or prior to rain events. Equipment that is operated near or in streams must be checked frequently and maintained to prevent leaks from the engine, transmission, or hydraulic systems and must be moved away from the drainage for refueling and maintenance.

Indirect impacts could include alterations to the existing topographical and hydrological conditions from soil disturbance and from the introduction of invasive and noxious animals or weeds. The establishment of noxious weeds could lead to conditions that result in adverse impacts to state and federal waters. Noxious weeds could lead to the displacement of native vegetation, alterations to hydrologic function, and degradation of habitat quality. The removal of vegetation could also result in a reduction of shade an increase in water temperatures.

To reduce these impacts the Applicant has proposed measures that include designing culverts to allow the safe passage of the 100-year storm event, limiting vehicle or equipment use in ponded or flowing water, monitoring burn areas, and implementing a SPCC. In addition, staff recommends **BIO-31** (Lake and Streambed Equivalency Conditions) which have been drafted in coordination with the CDFW to meet in-lieu permitting requirements. This condition includes measures that are consistent with Administrative, Avoidance and Minimization, Compensatory, Reporting, and Financial requirements that are included in a typical CDFW Lake and Streambed permit. These conditions would address the construction and operation of the Project during the 35-year lifespan. In addition, impacts to jurisdictional features and their associated resources are protected by the COCs required to protect biological resources and water quality. These include **BIO-1** through **BIO-30**, **FOREST-1** and **FOREST-2, WATER-1**, **WATER-2, WATER-5, AQ-SC3** and **AQ-SC4, HAZ-1, HAZ-6, HAZ-7,** and **HAZ-**

8, NOISE-6, and **WORKER SAFETY-1.** These measures include extensive pre-construction surveys, monitoring, habitat restoration, weed and invasive species control, storm water management, worker training, dust control, spill containment and reporting, verification of 401 and 404 permit requirements, and fire safety measures. With the implementation of these measures impacts to jurisdictional waters would be reduced to less than significant and meet CDFW regulatory requirements.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. Debris, ash, mud and other material can alter the function and services of State and federal waters and fill federal wetlands with debris. This can occur not only in the project area but across a broader region should the project hinder aerial firefighting. Therefore, impacts to jurisdictional waters would remain significant and unavoidable.

Background and Analysis. Operational impacts to most species of wildlife that have the potential to occur within riparian or wetland resources were determined to be significant and unavoidable. Although most of the jurisdictional features would remain after a large fire and would likely recover over time, there is a potential for sediment, ash and other debris to enter these jurisdictional features. Debris, ash, mud and other material can alter the function and services of State and federal waters and fill federal wetlands with debris.

Even with staffs proposed COCs some of these features may take years to recover or be lost from the input of sediment. Therefore, impacts to jurisdictional waters would remain significant and unavoidable.

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 wildlife nursery sites?

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. There is no established terrestrial wildlife corridors identified in the project area. However, the area is expected to support a variety of common and special status species. During construction the project will likely disrupt local movement for some most terrestrial species. The project area is located within, or near migratory corridors known to be used by special-status avian and bat species. These species will be affected to some degree from collisions and may put at risk migratory birds and bats.

Background and Analysis. Studies suggest that habitat fragmentation and isolation of natural areas ultimately result in the loss of native species within those communities (Soule et al., 1988). The ability for wildlife to move freely among populations is important to long-term genetic variation, demography, and sustainability. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short-term, wildlife movement may also be important to an animal's ability to occupy home ranges, if a species' range extends across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species; for species that require, and are often limited to, unique vegetation types for breeding and foraging; and for wide-ranging species such as elk, black bear, and mountain lion, that exist in low population densities.

The project area is not located in any areas identified as contiguous Natural Landscape Blocks or Essential Connectivity Corridors. However, the large tracts of timberland and various riparian corridors within, and adjacent to, the project area still provide opportunities for local terrestrial wildlife movement and connections for broader movements between older forest habitats of the Lassen and Shasta Trinity National Forests.

In addition, the project area occurs within the Pacific Flyway and is in proximity to the Fall River Valley and Upper McCloud River IBAs. It is also located along an important and routinely travelled migratory corridor for sandhill crane. As such, the project area is located within a general region characterized by a high diversity of avian species and a relatively high degree of avian breeding and migration. Some migratory bat species, such as hoary bat, are also known to occur within the project area.

The project area does not occur in proximity to any significant river or creekside corridors according to Shasta County General Plan maps. The Applicant has suggested that hydrological conditions for surface waters within the project Area tend to be intermittent or ephemeral in the winter months and dry in the summer depending on snow melt and winter rains (FWPA, TN 248288-6). The Applicant concludes that these conditions provide adequate passage for native resident and migratory fish when surface drainage is adequate. Although the project area does not support large streams and rivers with deep, cold, flowing waters, there are smaller perennial features that likely support the movement of local fish populations throughout the year.

Suitable fawning habitat for Columbian black-tailed deer occurs within the project area and is supported by dense forests and shrublands with abundant forage and nearby water. The project area also supports suitable breeding habitat for a variety of native bird species. Although no caves or mines have been identified in the project area that could be used as maternity sites for bats, some suitable features, including large trees, trees with exfoliating bark, snags, and scattered rocky outcrops are present.

Direct impacts during construction would include the immediate and permanent transition of forested and shrubby native vegetation communities to early seral stage

vegetation, increased noise and human presence, and the installation of structures that can impede wildlife movement in the area.

The removal of native vegetation would result in increasing the amount of, and distance between, areas that provide adequate cover for local and broad wildlife movement. Some wildlife species, including small mammals such as fisher, that require the cover provided by dense stands of vegetation would be more vulnerable to exposure and predation while moving through the project area. Inversely, the transition to early seral vegetation could provide beneficial impacts to species that prefer these types of habitats for hunting, foraging, or other activities. For example, large transient mammals will utilize open areas to pursue prey species that take advantage of low-growing vegetation communities (Berger, 2010).

Noise and increased human presence from construction activities could result to disruptions to terrestrial wildlife movement or disturbances to breeding and fawning habitat depending on the time of year that activities occur. However, the development of the project is not expected to exceed levels of activity that would occur in the project Area during routine timber harvesting operations or associated activities such as road maintenance. More mobile or wider-ranging animals, such as bear and deer, would be expected to continue to move through adjacent habitats that support dense underbrush and forested vegetation.

Construction of the project is not expected to pose substantial barriers to terrestrial or aquatic wildlife. The installation of any security fencing or other potential physical barriers that could impede wildlife movement would be limited to isolated buildings and structures. Species that primarily utilize riparian habitats, such as fish and amphibians could have local or migratory movements disrupted during road maintenance and culvert repairs or replacement; however, these disruptions would be temporary and no permanent barriers that would impede fish passage or local terrestrial movements over longer periods would be constructed within any drainage features.

Indirect impacts to wildlife movement would include habitat fragmentation and degradation of habitat from noxious weeds. Most of the project area consists of already highly fragmented lands that are privately owned and managed for timber production. The removal of vegetation may result in long-term impacts that restrict the movement of some wildlife species with limited dispersal ranges or increase the risk of predation when animals move across areas supporting less dense vegetation. The introduction and spread of noxious weeds could alter habitat conditions and affect the use of, and movement through, the area by wildlife.

Direct and indirect impacts that result in the disruption of wildlife movement through the project area or impediments to the use of wildlife nursery sites would be considered a significant impact under CEQA. To mitigate impacts, the Applicant would implement Staff's proposed **BIO-1** through **BIO-31**. Implementation of Staff's proposed COCs **BIO-1** through **BIO-31** would reduce impacts to less than significant.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. O&M activities have the potential to result in direct and indirect impacts to wildlife movement and nursery sites within and adjacent to the project area. Many of the impacts to wildlife movement corridors and nursery sites discussed for construction would be similar in type but reduced in magnitude during operational activities. However, operational impacts from collisions with wind turbines and uncontrolled wildfires that were determined to be significant and unavoidable for several bird and bat species would also be considered significant and unavoidable with respect to wildlife movement corridors and nursery sites since these species are known to migrate through and/or breed in and adjacent to the project area.

Background and Analysis. As previously mentioned, there are no established terrestrial wildlife corridors in the project area; however, less mobile terrestrial species would still be expected to exhibit local movement while foraging, searching for mates, or seeking habitat for refuge. Wider-ranging terrestrial species would also be expected to continue to move through the area during project operation with limited restrictions. The project area would continue to support suitable breeding and foraging habitat for terrestrial species that prefer low-growing vegetation communities to meet these requirements. Further, expansive areas of dense forests and timberlands would continue to be available immediately adjacent to the project area and in the general region for species, such as spotted owl and northern goshawk, that primarily utilize these habitats.

Although wildlife that move through the area or establish breeding sites (e.g., nests, dens, maternal colonies) would continue to be subject to impacts from human presence, noise, potential exposure to hazardous materials, and habitat fragmentation such impacts would be substantially reduced in magnitude since construction activities would be completed. Further, the baseline level of disturbance during operations would be less pronounced than routine timber harvesting activities that currently occur in the project area. No additional fencing or other permanent structures would be proposed upon the completion of construction. To mitigate operational impacts discussed above, the Applicant would implement Staff's proposed **BIO-1** through **BIO-31**. Implementation of Staff's proposed **BIO-1** through **BIO-31** would reduce impacts to less than significant.

The Applicant concluded that the project area does not appear to be located within an important migratory pathway for birds. Most data do not indicate well-defined migration patterns in the project area. Rather, broad-front, scattered migration is exhibited by most avian species in the general region. Staff acknowledges that the avian data appears to indicate a generally diffused pattern of migration but notes that the project area is located within the Pacific Flyway which supports a high diversity of resident and migratory avian species. Migrating passerines and seabirds, migrating waterfowl, raptors, resident birds, and nocturnal species would be at risk from collisions with wind

turbines and other project infrastructure during local movements between habitats or during long-range migratory flights. The project area is also situated immediately adjacent to a known migratory pathway for sandhill cranes, and it is likely that these species will continue to overfly the project area during the life of the project.

As discussed above, migratory bats are particularly vulnerable to collisions with wind turbines with 72% of all fatalities attributed to eastern red bat, hoary bat, and silver-haired bat. The latter two of these species are known or expected to occur in the project area and surrounding habitats. Hoary bats migrate from wintering ranges along the coast to inland breeding habitats and once settled, move between local roosting and foraging habitats. Silver-haired bats perform long flights in autumn to milder climates for hibernation.

According to CDFW, the nationwide hoary bat population is projected to decline by 50% by 2028 if fatalities at wind facilities continue unabated, even as a best-case scenario (Friedenberg and Frick, 2021). Evidence of region-wide hoary bat decline in the Pacific Northwest also provides support for the hypothesis that fatalities from wind energy have severely impacted the species (Rodhouse et. Al., 2019). While similar estimates are not yet readily available for silver-haired bat, the magnitude of fatalities estimated from the nearby Hatchet Ridge facility (at least 140-300 mortalities per year) could result in population-level impacts for this species with a low-reproductive rate.

Although there are no known established migratory corridors in the project area, numerous species of birds and bats are known to exhibit long-range migration and local movement through the general region. Impacts that result in direct mortalities to migratory and resident bird and bats moving through the project area, or that result in impediments to movement through the area due to collisions with wind turbines would be considered significant and unavoidable.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-1** through **BIO-31.** These measures contain a suite of conditions to protect sensitive resources, reduce the risk of wildfire, and restore or mitigate habitat disturbed during construction. In addition, **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1** provide additional protection to wildlife.

In addition to direct mortality from fire or smoke, wildfires can adversely affect wildlife and wildlife movement in a variety of ways. During the fire, safe travel corridors can be disconnected leaving wildlife, particularly terrestrial species, isolated, although larger, more mobile species may find alternate routes around the fire and some species may find safety by hiding underground. Post-fire effects may result in more substantial and long-term consequences for wildlife and wildlife movement. Wildfires can destroy or convert densely forested habitats to low-growing shrublands and grasslands resulting in a reduction in food sources and shelter for some species as well as increasing competition for these resources. Additionally, vulnerable and less mobile species can be faced with increased risk of predation in areas where adequate cover has been removed.

Wildfire can also have adverse effects on birds migrating along the Pacific Flyway and through the project area. As birds fly along their migration routes, they utilize a series of stops, each of which is vital to a bird's survival. If these stops are removed due to habitat loss or modification created by wildfire, individual birds are exposed to increased stressors along their migration route. This can result in mortality or a reduction in reproductive success.

CAL FIRE commonly uses a mix of aerial and ground firefighting to control and contain wildfires. However, in the event of a wildfire within or immediately adjacent to the project area, aerial firefighting resources would be restricted due to the size of the wind turbines thus prohibiting firefighting personnel access to these areas (CEC 2024i TN 254899, CEC 2024h – TN 254875). The decreased effectiveness that this would entail in fighting and controlling a wildfire in the project area could prolong firefighting activities or potentially allow a wildfire to spread into adjacent habitats. As such, the risk associated with uncontrollable wildfire during project operations would result in significant and unavoidable impacts to wildlife movement and nursery sites in and around the project area.

To reduce impacts from all O&M activity except for wildfire risk, the applicant would implement the same measures described above. These include **BIO-1** through **BIO-31**. These measures contain a suite of conditions to protect sensitive resources, reduce the risk of wildfire, and restore or mitigate habitat disturbed during construction. In addition, **AQ-SC3**, **AQ-SC4, HAZ-1**, **HAZ-6**, **HAZ-7**, **HAZ-8**, **WATER-1, WATER-2** and **WORKER SAFETY-1** provide additional protection to wildlife.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Construction

Less Than Significant with Mitigation Incorporated.

Basis for Conclusion. Relevant components of the following local and regional policy documents were reviewed for consistency with the project:

- Shasta County General Plan and Fish and Wildlife Habitat Element
- Oak Woodland Voluntary Management Guidelines

Generally, these policies and ordinances support the preservation, enhancement, and restoration of natural habitats and protection of special-status species. Some policies of the General Plan address specific areas or recommended actions that are not relevant to the project and have, therefore, not been included in the discussion below.

Construction of the project would result in the permanent removal of native trees and vegetation communities that provide habitat for a variety of common and special-status species. Most impacts would occur to managed timberlands that include early seral

stages of conifer woodlands, recently logged areas and woodlands proposed for harvest. Some impacts would also occur to riparian vegetation, wet montane meadows, and chaparral communities. Impacts would be mitigated by the implementation of Staff's proposed COC's.

Background and Analysis. Although Policy FW-b of the Shasta County General Plan recognizes that areas designated as Timberlands typically provide protections for habitat resources, it also requires consistency with State and federal laws if conflicts arise. Policy FW-c requires project design features or conditions to ensure that any net adverse project impacts to State or federally-listed species are avoided.

As discussed throughout this impact analysis, the project area supports habitat for several special-status species, including some that are State and/or federally listed. Construction activities that include the permanent removal of native trees and vegetation communities would result in impacts to a variety of special-status species that utilize these habitats. Therefore, these impacts could result in conflicts with Policies FW-b and FW-c of the General Plan. The Applicant would be required to comply with all State and federal laws during construction of the project. Additionally, impacts would be mitigated by the implementation of Staff's proposed COCs. Therefore, any impacts associated with conflicts with Policies FW-b or FW-c of the General Plan would be reduced to less than significant.

The project area does not occur in proximity to any significant river or creekside corridors according to General Plan maps. However, the project would result in temporary and permanent direct and indirect impacts to wetlands and other waters under the jurisdiction of the USACE and the RWQCB. CDFW requirements are being achieved by compliance with staffs recommended **BIO-31** (Lake and Streambed Equivalency Conditions) which have been drafted in coordination with the CDFW to meet in-lieu permitting requirements. To comply with State and federal laws and regulations, the Applicant will coordinate with these agencies and secure the applicable permits. To further mitigate impacts to wetlands and other waters, Staff's proposed COCs would be implemented. These include **BIO-1** through **BIO-31, FOREST-1** and **FOREST-2**, **WATER-1** and **WATER-2**, **AQ-SC3** and **AQ-SC4**, **HAZ-1**, **HAZ-6**, **HAZ-7**, and **HAZ-8**, **NOISE-6**, and **WORKER SAFETY-1**. Therefore, any impacts associated with conflicts with Policy FW-d of the General Plan would be reduced to less than significant.

The project is not located within or adjacent to any primary or secondary water bodies associated with the Upper Sacramento River Fisheries and Riparian Habitat Management Plan. Although minor tributaries to these features do occur within and adjacent to the project area, construction of the project would not impede efforts by State and federal agencies to implement the plan. Therefore, construction of the project would not result in conflicts to Policy FW-f of the General Plan.

There are no oak woodlands within the project area; however, construction of the project would result in the permanent removal of some isolated oak trees. The removal of oak trees during project construction would represent a negligible loss of canopy that

would not exceed the 30 percent threshold identified in the Oak Woodland Voluntary Management Guidelines. Therefore, construction of the project would not result in conflicts to the guidelines.

Operation

Significant and Unavoidable Impact.

Basis for Conclusion. Operational impacts were determined to be significant and unavoidable for many State and/or federally-listed wildlife species. In addition, impacts to native vegetation communities and riparian habitats that support many of the State and/or federally-listed species discussed above were determined to be significant and Unavoidable. Policy FW-c of the General Plan requires the project to be designed or conditioned to avoid any net adverse impacts on those species.

Background and Analysis. As described above, project operation and maintenance activities would result in significant and unavoidable impacts to several special-status wildlife species and their habitat because of turbine collisions and/or impeding aerial operations in the event that a large and uncontrollable wildfire occurs within or adjacent to the project area. These impacts would not directly conflict with Policy FW-b of the General Plan since the Applicant would still be required to comply with State and federal laws and regulations during project operation and maintenance activities. Operation and maintenance activities would not occur within or adjacent to and significant river or creekside corridors or impede efforts by State and federal agencies to implement the Upper Sacramento River Fisheries and Riparian Habitat Management Plan as required under Policies FW-d and FW-f. respectively. However, staff considers impacts associated from turbine collisions and/or impeding aerial operations during a wildfire to conflict with Policy FW-c of the General Plan which would result in significant and unavoidable impacts.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Construction and Operation

No Impact.

Basis for Conclusion. The project does not occur within any known areas designated under an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, there would be no impact.

5.2.2.3 Cumulative Impacts

Cumulative projects are identified as past projects, current projects, or reasonably foreseeable future projects that, when viewed in connection with the proposed project,

cause its effects on biological resources to be potentially significant. **Table 1-2** in **Appendix 1,** provides a list of past, present, and reasonably foreseeable projects that may be relevant to the cumulative analysis for each issue area.

Geographic Extent/Context

The geographic extent for the analysis of cumulative impacts related to biological resources includes Shasta County and adjacent migration and movement corridors, including local rivers and streams and the Pacific Flyway for migratory birds. In addition, the cumulative context includes portions of the Shasta Trinity National Forest and Lassen National Forest that occur within Shasta County.

Cumulative Impacts

A cumulative impact to biological resources would occur if:

- The total permanent conversion of commercial timberlands and native vegetation communities from the project in combination with other projects in Shasta County would be cumulatively considerable.
- The level of avian and bat mortalities from collisions with wind turbines, transmission lines, and other facilities from the project in combination with other wind power projects or facilities that result in mortality to birds and bats, both locally and more broadly within or adjacent to the Pacific Flyway in California, would be cumulatively considerable.
- The level of risk associated with impeding aerial firefighting operations during an uncontrollable wildfire that results in habitat loss and/or mortalities of special-status wildlife species, when combined with other projects in Shasta County, would be cumulatively considerable.

Permanent conversion of habitat. Shasta County is one of the most rural counties in California. However, past development in the region, including timber harvesting, resulted in substantial loss of native habitat and degradation of aquatic habitat and water quality in the county's watersheds. The county is in an area of California with the greatest rate of timberland conversion (i.e., 49% of conversions were found to occur in northern California).

Implementation of the project would result in the permanent conversion of commercial timberlands and native vegetation communities that provide habitat for common and special-status species. The loss of habitat from development of the projects listed in **Table 1-2** combined with conversion of forested lands from historic and ongoing timber harvesting in Shasta County would contribute to cumulatively considerable impacts to biological resources. The conversion of these habitats as a result of construction of the project would be mitigated through implementation of **BIO-8** and **BIO-31**, which requires the restoration of temporarily disturbed areas with low-growing native species, replanting oaks and other riparian vegetation that is temporarily disturbed, and providing compensatory mitigation for permanent impacts to riparian or

sensitive vegetation communities. In addition, implementation of **FOREST-1** and **FOREST-2** would require land trust funding for the permanent conversion of timberlands to non-timberland use and ensure that forest regeneration is successful within areas that are temporarily disturbed. Impacts to listed plant species is not expected to occur although there is some potential for impacts to special status plant species. Impacts to special status plants would not be cumulatively considerable. Implementation of Staffs proposed COCs would reduce project-specific impacts on special-status species and their habitat to less than significant. Therefore, the project would not contribute to cumulatively considerable impacts from the permanent or temporary conversion of habitat.

Bird and bat mortalities from collisions. The greatest biological resource impact associated with operation of wind power facilities is mortality of birds and bats due to collision with turbines and other infrastructure. When considered in a cumulative context, the geographical extent for impacts associated with bird and bat collisions includes local mountain ranges within Shasta County to account for movement within a resident species' home range and a much broader area along the Pacific Flyway in California to account for long-ranging migratory species, such as greater sandhill crane.

Potential impacts resulting from additional wind generation along the Pacific Flyway within California are difficult to quantify. The potential for bird and bat collisions varies greatly depending on the location of the wind development, technology utilized, and surrounding land uses. However, impacts from collisions are well documented throughout the United States, including California, and are known to result in large-scale mortalities to birds and bats. Such impacts associated with the project were determined to be significant and unavoidable. Therefore, the project's contribution to bird and bat mortalities from collisions, when combined with other local wind projects and wind projects within or adjacent to the Pacific Flyway in California, would be cumulatively considerable and impacts would be significant and unavoidable.

Loss of Waters regulated by the USACE, CDFW, RWQCB, or protected by local regulations. Shasta County supports a variety of important waterways that provide habitat for numerous sensitive plants and wildlife. Construction of the project would result in permanent and temporary impacts to some jurisdictional drainages. Implementation of Staffs proposed COCs would reduce project-specific impacts on jurisdictional drainages to less than significant. Therefore, the project would not contribute to cumulatively considerable impacts from the permanent or temporary conversion of jurisdictional habitat.

Loss of habitat and mortalities of special-status wildlife from wildfire. Shasta County has experienced several major fires in the last 30 years, plus numerous smaller fires each year that were caught in initial stages and contained by aggressive fire suppression or otherwise restrained by less than perfect fire weather conditions (Shasta County 2016). Some of the largest fires in California history have occurred within or included portions of Shasta County including the 2021 Dixie Fire and 2018 Carr Fire, the second and thirteenth largest fires in California history, respectively.

Wildfires in rural areas, such as Shasta County, can have significant adverse ecological impacts that result in habitat loss and fragmentation, permanent conversion of native vegetation communities, and direct mortality of common and special-status wildlife species. As discussed in **Section 5.7, Hazards, Hazardous Materials, and Wildfire**, impacts associated with impediments to providing a full suite of firefighting assets in the event of a wildfire in the project area were determined to be significant and unavoidable. The analysis above provides a discussion of how these impacts would relate to biological resources, including several special-status wildlife species and their habitat. Subsequently, Staff determined that, due to the impediments to employing aerial firefighting methods discussed in **Section 5.7, Hazards, Hazardous Materials, and Wildfire**, impacts from an uncontrollable wildfire would be considered significant and unavoidable to a variety of special-status wildlife species and their habitat.

However, in a cumulative context, it is important to note that impacts would be considerable if the project, combined with other projects, would contribute to habitat loss and wildlife mortality due to impeding firefighting activities across the geographic extent of the analysis. None of the cumulative projects, except Hatchett Ridge (cumulative project 19), would have the ability to impair aerial firefighting. The potential of the project combined with Hatchett Ridge to impair aerial firefighting is specific to the area at and immediately adjacent to each project. Therefore, in terms of the broader geographic extent of the cumulative analysis, impacts resulting from habitat loss and special-status mortality due to uncontrollable wildfire would not add, in a cumulative sense, to the significant and unavoidable impacts created by project directly.

5.2.3 Project Conformance with Applicable LORS

Table 5.2-8 provides staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that even with implementation of specific conditions of certification, the proposed project would not be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.2-8 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Federal	
Federal Endangered Species Act (16 USC §§ 1531 et seq. and 50 CFR part 17.1 et seq.)	
Designates and protects federally threatened and endangered plants and animals and their critical habitat. Applicants for projects that could result in adverse impacts on any federally listed species are required to mitigate potential impacts in consultation with USFWS.	**No.** Although construction s of the proposed Project would comply with the Act through formal consultation with USFWS and implementation of Staff's proposed COCs, operational impacts would be inconsistent with the Act. Operation of the project has the potential to enhance the spread of wildfires across the project site and to adjacent national forests lands. These fires have the potential to result in unanticipated and potentially catastrophic impacts

TABLE 5.2-8 CONFORMANCE WITH APPLICABLE LORS	
	to a variety of sensitive plants and wildlife. Staff considers these impacts to be significant and unavoidable impacts for some species that are listed as federally threatened or endangered. In addition, these fires can result in the destruction of habitat supporting these species. Take permits do not cover species mortality or habitat loss due to accelerated wildfire spread.
Bald and Golden Eagle Protection Act (16 USC §§ 668 to 668c)	
Provides for the protection of the bald and golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures.	**No.** Although construction of the proposed Project would comply with the Act through the implementation of Staff's proposed COCs, operational impacts would result from collision risks with WTGs and loss of active nests or individual birds should fires occur during the breeding season. Staff determined that the implementation of proposed COCs would mitigate potential impacts from collisions to less than significant. The project's potential to enhance the spread of wildfires to national forests could result in unavoidable significant impacts to bald and golden eagles or destruction of habitat supporting these species. Take permits do not cover species mortality or habitat loss due to accelerated wildfire spread. Thus, the project is inconsistent with the Act.
Migratory Bird Treaty Act (16 USC §§ 703 to 711)	
Makes it unlawful to take or possess any migratory nongame bird (or any part of such a migratory nongame bird as designated in the Act.	**No.** Implementation of Staff proposed COCs, including establishing non-disturbance buffers for active bird nests and biological monitoring would ensure that impacts during construction are mitigated to less than significant. However, operational impacts associated with potential collisions with WTGs and the loss of nests and young birds in the event of an uncontrollable wildfire were determined by Staff to be significant and Unavoidable. The project's potential to enhance the spread of wildfires to national forests could result in unavoidable significant impacts for some migratory nongame bird species and the project would therefore be inconsistent with the Act.
Clean Water Act §§ 401 and 404 (33 USC §§ 1251 to 1376)	
Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the USACE for a discharge of dredged or fill materials into waters of the U.S., including wetlands. Section 401 requires a permit from a RWQCB for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request state certification that the proposed activity will not violate state and federal water quality standards.	**No.** Construction of the proposed Project has the potential to result in temporary impacts to a variety of ephemeral, intermittent, and perennial features that would meet Sections 401 and 404 requirements for jurisdiction of the RWQCB and USACE, respectively. Potential impacts during construction of the proposed Project would be mitigated to less than significant through the implementation with Staff's proposed COCs. However, Staff determined that, even with the implementation of proposed COCs, the potential impacts to jurisdictional waters and wetlands from an uncontrollable wildfire would be significant and Unavoidable and therefore inconsistent with the Act.

TABLE 5.2-8 CONFORMANCE WITH APPLICABLE LORS	
Rivers and Harbors Act § 10 (33 USC §§ 401 et seq.)	
Requires authorization from USACE for the construction of any structure in or over any navigable water of the U.S.	**Yes.** The appropriate permits would be required from USACE prior to the construction of any structure in or over navigable waters of the U.S. within the Project area.
State	
California Endangered Species Act (CFGC §§ 2050 to 2098)	
Species listed under this act cannon be "taken" or harmed, except under specific permit.	**No.** Although construction of the proposed Project would comply with the Act through formal consultation with CDFW and implementation of Staff's proposed COCs, operational impacts would be inconsistent with the Act. Operational impacts would result from collisions with WTGs and loss of individuals and habitat from uncontrollable wildfires. The project's potential to enhance the spread of wildfires to national forests could result in unavoidable significant impacts for some species that are listed as state threatened or endangered or destruction of habitat supporting these species. Take permits do not cover species mortality or habitat loss due to accelerated wildfire spread. Staff considers these impacts to be significant and Unavoidable for some species that are listed as state threatened or endangered.
Fully Protected Species (CFGC §§ 3511, 4700, 5050, and 5515)	
Lists animals species that are fully protected in California and states that these species may not be "taken" or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species. However, California Senate Bill 147 (SB 147), passed in July 2023, authorizes CDFW to issue permits for the incidental take of fully protected species for certain projects, including renewable energy.	**No.** Staff determined that potential impacts to fully-protected species, including greater sandhill crane, bald eagle, and ringtail, would be mitigated to less than significant during construction with the implementation of proposed COCs. Although SB 147 authorizes the issuance of permits of take for fully-protected species and proposed COCs would be implemented, Staff determined that operational impacts to fully protected species associated with collisions with WTGs and uncontrollable wildfire would be significant and Unavoidable. The project's potential to enhance the spread of wildfires to national forests could result in unavoidable significant impacts for some species that are listed as state threatened or endangered or destruction of habitat supporting these species. Take permits do not cover species mortality or habitat loss due to accelerated wildfire spread. Therefore, operation of the proposed Project would be inconsistent with these sections of the CFGC.
Migratory Birds (CFGC §§ 3503, 3503.5, 3513, and 3800)	
Makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any migratory bird.	**No.** Implementation of Staff proposed COCs, including establishing non-disturbance buffers for active bird nests and biological monitoring would ensure that impacts during construction are mitigated to less than significant. However, operational impacts associated with potential collisions with WTGs and the loss of nests and young birds in the event of an uncontrollable wildfire were determined by Staff to be significant and Unavoidable. The project's potential to enhance the spread of wildfires to national

TABLE 5.2-8 CONFORMANCE WITH APPLICABLE LORS	
	forests could result in unavoidable significant impacts for some species of migratory birds. Take permits do not cover species mortality or habitat loss due to accelerated wildfire spread. Therefore, the project would be inconsistent with these sections of the CFGC.
Furbearing Mammals (CFGC §251.1 and Title 14 §460)	
Contains regulations for taking furbearing mammals, including prohibiting the harassment or unapproved take of furbearing mammals, including fisher, American badger, Sierra Nevada Mountain beaver, Pacific marten, and Sierra red fox.	**No.** Potential construction impacts to furbearing mammals protected under Title 14 would be mitigated to less than significant with the implementation of Staff proposed COCs. Operational impacts were determined by Staff to be less than significant with mitigation for Sierra red fox; however, significant and Unavoidable for Sierra Nevada Mountain beaver, Pacific marten, fisher, and American badger. Staff considers impacts associated with uncontrollable wildfire would result in adverse effects inconsistent with CFGC §251.1 and Title14 regulations.
Native Plant Protection (CFGC §§ 1900 et seq.)	
Designates state rare and endangered plants and provides specific protection measures for identified populations. The Act also prohibits the take of rare and endangered native plants with exceptions for agricultural and nursery operations, emergencies, or in proper coordination with CDFW under specific circumstances.	**Yes.** Potential impacts to rare and endangered native plants during construction were determined to be less than significant with the implementation of Staff proposed COCs. Due to the variability that wildfires have on native plant species, operational impacts were also determined to be less than significant with the implementation of Staff proposed COCs.
Porter-Cologne Water Quality Control Act (California Water Code Division 7)	
Directs responsibility to RWQCBs for granting Waste Discharge Requirements (WDRs) or National Pollutant Discharge Elimination System (NPDES) permits for discharges to waters of the state. The Act also establishes water quality objectives to protect the beneficial uses of surface and groundwater resources.	**No.** Construction of the proposed Project has the potential to result in temporary impacts to a variety of ephemeral, intermittent, and perennial features that would meet requirements of waters of the state under RWQCB jurisdiction. Potential impacts during construction of the proposed Project would be mitigated to less than significant through the implementation with Staff's proposed COCs. However, Staff determined that, even with the implementation of proposed COCs, the potential impacts to jurisdictional waters and wetlands of the state from an uncontrollable wildfire would be significant and Unavoidable and therefore inconsistent with the Act.
California Lake and Streambed Alteration Notification/Agreement (CFGC §1602)	
Prohibits alteration of any water body meeting the CDFW jurisdictional requirements of the CFGC without the appropriate permits.	**No.** Construction of the proposed Project has the potential to result in temporary impacts to a variety of ephemeral, intermittent, and perennial features that would meet Section 1602 requirements for jurisdiction under CDFW. Potential impacts during construction of the proposed Project would be mitigated to less than significant through the implementation with Staff's proposed COCs. However, Staff determined that, even with the implementation of proposed COCs, the potential impacts to features under the jurisdiction of CDFW from an uncontrollable wildfire would

TABLE 5.2-8 CONFORMANCE WITH APPLICABLE LORS	
	be significant and Unavoidable and therefore inconsistent with the CFGC.
Oak Woodlands Preservation Act (California PRC §21083.4	
States that if a County determines that a project in its jurisdiction may result in a conversion of oak woodlands that would be considered significant under CEQA, then mitigation for this impact is required.	**Yes.** No oak woodlands occur in the Project area. Although construction would result in the removal of isolated oak trees, conversion of oak woodlands would not occur, and the Project is therefore consistent with the Act.
Local	
Shasta County General Plan	
Chapter 6.7 – Fish and Wildlife Habitat Element	
Policy FW-b. Recognizes that classification of some fish, wildlife, and vegetation resources designated and used as Timberlands in most cases protects habitat resources. Requires Timberlands classifications to comply with state and federal laws if there is a conflict.	**No.** Staff determined that potential impacts to biological resources, including fish, wildlife, and vegetation, during construction would be mitigated to less than significant with the implementation of proposed COCs. However, operational impacts associated with collisions with WTGs and uncontrollable wildfires would conflict with many of the state and federal laws included in this table. Therefore, the Project would not be consistent with Policy FW-b.
Policy FW-c. Requires projects that contain and may impact endangered and/or threatened plant or animal species to be designed or conditioned to avoid any net adverse project impacts on those species.	**No.** Although construction of the proposed Project would be consistent with Policy FW-c through the implementation of Staff's proposed COCs, operational impacts from collisions with WTGs and loss of individuals and habitat from uncontrollable wildfires would result in net adverse project impacts to endangered and/or threatened species. Staff considers these impacts to be significant and Unavoidable for some species that are listed as federally threatened or endangered. Therefore, operation of the Project would not be consistent with Policy FW-b.
Policy FW-d. Identifies significant river and creekside corridors of Shasta County and protects associated riparian habitats from development and adverse impacts.	**Yes.** There are no significant river and creekside corridors within the Project area; however, the Project would result in temporary and permanent impacts to riparian habitats. Staff determined that impacts would be less than significant with the implementation of proposed COCs and therefore consistent with Policy FW-d.
Policy FW-f. Compels the County to encourage and support efforts by state and federal agencies that implement the Upper Sacramento River Fisheries and Riparian Habitat Management Plan.	**Yes.** The Project area is not located within or adjacent to any primary or secondary water bodies associated with the Upper Sacramento River Fisheries and Riparian Habitat Management Plan. Although minor tributaries to these features do occur within and adjacent to the Project area, construction or operations would not impede efforts by state and federal agencies to implement the Plan.
Oak Woodland Voluntary Management Guidelines	
Voluntary guidelines to encourage retention of an average canopy of 30 percent or more when harvesting oaks, including trees of a variety of species, ages, and conditions, as well as brush	**Yes.** Construction of the Project would result in the removal of isolated oak trees; however, Staff determined that this would represent a negligible loss of canopy that would not exceed the 30 percent threshold described in the Guidelines. Therefore, the Project would be consistent with the Guidelines.

TABLE 5.2-8 CONFORMANCE WITH APPLICABLE LORS	
piles, hollow trees, and other habitat components.	

5.2.4 Conclusions and Recommendations

As discussed in section 5.2.2 the proposed project would have a less-than-significant impact associated with construction activities. However, operation of the project would result in significant and unavoidable impacts to numerous biological resources including most species of wildlife, birds, bats, and jurisdictional resources such as streams, creeks, and other waterways. Significant and unavoidable impacts would primarily occur from the increased risk of wildfire should fires start or spread to adjacent forest lands and from collisions with the WTGs and other project features. Birds and bats are at particular risk including the state fully protected sandhill crane and other species. In addition, operation of the project would not conform with Shasta County Municipal Code sections 6.7 – Fish and Wildlife Habitat Element due to the risk of wildfires. Staff has proposed several mitigation options that reduce the risk of avian and bat collisions, however there is no feasible mitigation to offset the risk of wildfires.

5.2.5 Proposed Conditions of Certification

The following proposed conditions of certification include measures to mitigate environmental impacts, ensure conformance with applicable LORS, and where possible meet the fully mitigate standard required to meet CDFW regulations. However, even with the implementation of these measures, operational impacts from the proposed project would remain significant and unavoidable for many resources.

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval and the CDFW and USFWS for review and comment.

1. The Designated Biologist must meet the following minimum qualifications;
2. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
3. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and
4. At least three years of field experience with biological resources found in or near the project area.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM that the proposed Designated Biologist or alternate has

the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 75 days prior to the start of site mobilization or construction-related ground disturbance activities. No pre-construction site mobilization or construction related activities shall commence until a Designated Biologist has been approved by the CPM.

If a Designated Biologist needs to be replaced, the specified information regarding the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, demolition, and construction activities. The project owner may request approval from the CPM to terminate the Designated Biologist's function during plant operation in writing and provide justification of the request. However, the project owner shall appoint a replacement Designated Biologist at any time as directed by the CPM and will ensure the same duties are performed during closure and restoration activities. If no Designated Biologist is available at any time during the life of the project (including operation phase) and the CPM determines that project-related actions may affect biological resources, the CPM may direct the project owner to assign a Biological Monitor or replacement Designated Biologist, for short-term or long-term monitoring and reporting. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the primary contact for the project owner and CPM. The Designated Biologist Duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resource conditions of certification;
2. Ensure that all conditions of certification are met and that all reporting standards for each condition of certification are completed and submitted to the CPM and any other regulatory agencies in compliance with specified timelines.
3. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;
4. Be available to supervise other biological resource staff, conduct and coordinate mitigation, monitoring, and other biological resources compliance

efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species or their habitat;

5. Ensure that all sensitive biological resource areas are flagged, delineated, or marked, and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
6. Notify the CPM if any unanticipated sensitive biological resources are encountered during all phases of the project. Unanticipated resources include sensitive species not addressed in the environmental document because of a perceived low potential to occur, species that are known to occur but have been proposed as a candidate for state or federal listing after the approval of the project; and common species whose range is unexpected in the project area.
7. Inspect or direct the site personnel how to inspect active construction areas where animals may have become trapped prior to construction commencing each day. Inspect or direct the site personnel how to inspect the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way. Inspect soil or spoil stockpiles and dust abatement watering for compliance with Condition of Certification **BIO-7**. Inspect erosion control materials (e.g., hay bales) to confirm weed-free certification. Inspect weed infestations and monitor eradication measures to determine success. Inspect trash receptacles, monitor site personnel compliance with trash handling, pet prohibitions, and all other WEAP components (Condition of Certification **BIO-5**);
8. Ensure the implementation of the post construction conditions of certification including but not limited to **BIO-14** (Insect Mortality Monitoring Plan), **BIO-28** (Avian and Bat Mortality Monitoring and Adaptive Management Plan), **BIO-29** (Implement a Technical Advisory Committee for Birds and Bats), and **BIO-30** (Implement Seasonal Curtailment);
9. Notify the project owner and the CPM directly per the requirements of **BIO-4** of any non-compliance with any biological resources condition of certification;
10. Notify the project owner and the CPM directly of any special-status species injury or mortality by the end of the business day.
11. Respond directly to inquiries of the CPM regarding biological resource issues by phone, email, or other correspondence;
12. Maintain written records of the tasks specified above and those included in the BRMIMP; Summaries of these records shall be submitted in the Monthly Compliance Reports (MCRs) and the Annual Compliance Report (ACR);

13. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits; and

14. Maintain the ability to be in regular, direct communication with representatives of CDFW, USFWS, and CPM, including notifying these agencies of dead or injured listed species and reporting special status species observations to the California Natural Diversity Database.

Verification: The Designated Biologist will notify the CPM of any non-compliance or special-status species injury or mortality by the end of the business day. The Designated Biologist shall submit in the MCRs to the CPM copies of all written reports and summaries that document construction activities that have the potential to affect biological resources. The Designated Biologist's written records will be made available for the CPM's inspection on request at any time during normal business hours. During project operation, the Designated Biologist(s) shall submit record summaries in the ACR unless their duties cease, as approved by the CPM.

BIOLOGICAL MONITOR SELECTION

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information of the proposed Biological Monitor(s) to the CPM for approval and the CDFW and USFWS for review and comment. The resume shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Verification: The project owner shall submit the specified information to the CPM for approval and to the CDFW and USFWS for review and comment at least 45 days prior to the start of any project-related site disturbance activities. Within 10 days of completion of training, the Designated Biologist shall submit a written statement to CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed. If additional biological monitors are needed during construction or for species specific surveys, the specified information shall be submitted to the CPM for approval at least 10 days prior to their first day of monitoring activities.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resource conditions of certification.

1. If required by the Designated Biologist or Biological Monitor(s), the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

2. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
3. Inform the project owner and the construction/operation manager when to resume activities;
4. The Designated Biologist or Biological Monitor shall notify the CPM immediately and no later than the morning following the incident, or Monday morning in the case of a weekend of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities;
5. Notify the CPM if there is a halt of any activities and advise the CPM of any corrective actions that have been taken or would be instituted as a result of the work stoppage; and
6. The CPM, in coordination with CDFW or USFWS, as appropriate, will determine if corrective action has been effective and will direct the project owner to take further corrective action as needed.
7. If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem within one (1) working day of initiating the corrective action.

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-5 The project owner shall develop and implement a project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from the CPM. The project owner shall also provide the USFWS and CDFW a copy of all portions of the WEAP for review and comment. The WEAP shall be administered to all onsite personnel who will enter the project site including but not limited surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, biologists, firefighting crews, cultural, tribal, paleontological monitors, and delivery personnel. An abbreviated WEAP (WEAP Light) can be provided to vendors who periodically enter the project site and are limited to areas such as existing access roads and or lay down areas. The WEAP Light shall also be submitted for approval from the CPM and submitted to the USFWS and CDFW for review and comment. The WEAP shall be implemented during site mobilization, vegetation clearing, preconstruction, construction, commissioning, operation, non-operation, and closure. All workers must complete the WEAP prior to commencing work on the Project. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist (See **BIO-1**) and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species and their habitat, is made available to all participants;
2. Identify the lead agencies, provide an overview of the conditions of certifications, other regulatory permit requirements, and applicable LORS that must be complied with and the ramifications of non-compliance which may include fines, imprisonment, work stoppages, or loss of employment depending on the violation;
3. Identify the roles of environmental staff and define communication protocols and chain of command between environmental and construction staff. Define what actions monitors can approve such as stopping work under specific circumstances, providing guidance to comply with conditions, conducting surveys, and what actions monitors cannot approve such as directing work, expanding work areas from approved limits, changing conditions of certification requirements, or approving variances to permit conditions. Identify key field contacts and ensure that this information is posted in all break areas;
4. Provide examples of environmental signage and flagging that would be used to delineate work limits; areas for avoidance, state and or federal drainages, or other protected areas, evacuation routes, and approved staging areas;
5. Discuss the locations and types of sensitive biological resources on the Project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that no snakes or other wildlife shall be intentionally harmed (unless posing a reasonable and immediate threat to humans);
6. Describe standard environmental commitments and best management practices that apply to the project including but not limited to: storing trash in closed receptables and removing weekly to prevent attracting animals, capping pipes and other cavities that could be used by birds and small mammals; collecting and removing the carcasses of dead animals; limiting work to daytime hours, limiting work during periods of high rainfall, preventing vehicles and equipment from operating within a stream unless specifically authorized by other permits or conditions of certification; restricting smoking to designated areas supporting bare mineral earth; storing chemicals and fuel in designated areas; spill prevention measures; and reporting requirements.
7. Identify project vehicle speeds on paved and unpaved access roads;
8. Place special emphasis on the protection of nesting birds, species of special concern and listed species including pictures and information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities,

legal protection, penalties for violations, reporting requirements, and protection measures;

9. Provide pictures of bald and golden eagles, CA spotted owls, fishers, northern pond turtles, cascades and yellow legged frogs, and other sensitive plants and wildlife, and provide information on sensitivity to human activities, legal protection, reporting requirements, and how to identify construction avoidance zones for these species as marked by flagging, staking, or other means, as described above;
10. Provide an overview for all personnel of the risk of potential impacts to small mammals, birds, reptiles and amphibians from vehicle strikes on all project roads (paved and unpaved) during construction, operations, closure phases, reporting requirements, and protection measures;
11. Describe the risk of wildfires and the measures that will be taken to reduce these risks such as avoiding parking in tall vegetation, limits to where workers can smoke; the locations of fire safety equipment, contact information and the procedure should a wildfire be ignited, required tools for each piece of equipment such as a shovel, Pulaski, and fire extinguisher, restrictions on welding and blasting, use of the Project Activity Level (PAL) system that describes what activities can occur based on specific weather conditions including Red Flag days;
12. Provide an overview of potential impacts to avian and bat species from collisions with the turbines, transmission lines, MET towers, and other features associated with the operations phase, reporting requirements, and protection measures;
13. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
14. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines. A small wallet card with key contacts and resource information shall be prepared and provided after the training. A hard hat sticker shall also be provided to each worker to demonstrate to the monitors that they have participated in the training.
15. The WEAP Light shall include a summary of the items above as they relate to the limited areas that vendors need to access such as existing access roads and or lay down areas.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist and documented within the Monthly Compliance Reports.

Verification: At least 45 days prior to start of site mobilization the project owner shall provide to the CPM for review and approval and to CDFW and USFWS for review and comment the final WEAP and all supporting written materials and electronic

media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site mobilization the project owner shall submit the approved final WEAP and implement the training for all workers.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least 6 months after the start of commercial operation.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within 1 week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to the CPM, CDFW, and USFWS upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

During Project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-6 The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP shall incorporate all proposed Conditions of Certification that have the potential to affect biological resources. In addition, all avoidance and minimization measures described in final versions of required biological resource related plans including WEAP, Habitat Restoration Plan, Weed Control Plan, Avian and Bat Mortality Monitoring Plan, Invasive Species Management Plan, Nesting Bird Management Plan, and all other individual biological mitigation and/or monitoring plans associated with the project. The project owner shall provide to CDFW and USFWS a copy of all portions of the BRMIMP relating to any state and federal or state-listed species for review and comment.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during

construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. all biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the Project owner;
2. all biological resources conditions of certification identified as necessary to avoid or mitigate impacts;
3. all biological resource mitigation, monitoring, and compliance measures required in state or federal agency terms and conditions, such as those provided in the USFWS Biological Opinion, National Pollution Discharge Elimination System (NPDES) Construction Activities Stormwater General Permit or USACE Section 404 Permit and SWRCB401 Certification . if issued;
4. all sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;
5. all required mitigation measures for each sensitive biological resource, including remedial actions;
6. aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Provide planned timing of aerial photography and a description of why times were chosen. Provide a final accounting of the before/after whole acreages and a determination of whether more or less habitat compensation is necessary;
7. all measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
8. duration for each type of monitoring and a description of monitoring methodologies and frequency;
9. performance standards to be used to help decide if/when proposed mitigation is or is not successful;
10. all performance standards and remedial measures to be implemented if performance standards are not met;
11. a discussion of biological resources-related facility closure measures including a description of funding mechanism(s);
12. a process for proposing plan modifications to the CPM and appropriate agencies for review and approval; and
13. a requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site, or during project surveys, to the CNDDB per CDFW requirements.

Verification: The project owner shall submit the draft BRMIMP to the CPM for approval and the CDFW and USFWS for review and comment at least 45 days

prior to start of any site mobilization. The project owner shall provide final BRMIMP to the CPM, CDFW and USFWS at least 7 days prior to start of any site mobilization. The BRMIMP shall contain all of the required measures included in all biological conditions of certification and any other relevant permits. No site mobilization or construction activities may occur prior to approval of the final BRMIMP by the CPM.

If any federal permits have not yet been received when the final BRMIMP is submitted, these permits shall be submitted to the CPM within 5 days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition(s). The project owner shall submit to the CPM, CDFW, and USFWS the revised or supplemented BRMIMP within 10 days following the project owner's receipt of any additional federal permits. Under no circumstances shall ground disturbance proceed without implementation of all permit conditions.

To verify that the extent of construction disturbance does not exceed that described in these conditions, the project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM, USFWS and CDFW. The first set of aerial photographs shall reflect site conditions prior to any preconstruction site mobilization and construction activities-related ground disturbance, grading, boring, and trenching, and shall be submitted prior to initiation of such activities. The second set of aerial photographs shall be taken subsequent to completion of construction, and shall be submitted to the CPM for review and approval, USFWS and CDFW for review and comment, no later than 30 days after completion of construction. The project owner shall also provide a final accounting in whole acres of vegetation communities/cover types present before and after construction no later than 30 days after completion of construction. Construction acreages shall be rounded to the nearest acre. The project owner shall also provide GIS shape files of all pre-and post-disturbance areas no later than 30 days after completion of construction.

Any changes to the approved BRMIMP shall be submitted to the CPM at least 10 days prior to implementation and must be approved by the CPM in consultation with CDFW and USFWS prior to implementation.

Implementation of BRMIMP measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's preconstruction site mobilization and construction activities-related ground disturbance, grading, boring, and trenching, and which mitigation and monitoring items are still outstanding.

GENERAL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-7 The project owner shall ensure implementation of the following measures during site mobilization, construction, operation, and closure to manage their project site and related facilities in a manner to avoid or minimize impacts to biological resources:

1. **Avoid Night Work.** All construction-related Project activity will terminate 30 minutes before sunset and will not resume until 30 minutes after sunrise unless authorized by the CPM in consultation with the CDFW. Sunrise and sunset times are established by the U.S. Naval Observatory Astronomical Applications Department for the geographic area where the project is located;
2. **Limit Disturbance Areas.** The boundaries of all areas to be temporarily or permanently disturbed (including staging areas, access roads, wind turbine generators (WTG) sites, fuel breaks, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to any site mobilization, vegetation clearing, ground disturbance, or construction activities in consultation with the Designated Biologist. Spoils shall be stockpiled 50-feet away from drainages and stabilized to ensure sediment laded water does not enter any waterway, meadow, seep, or drainage. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, vehicles, and equipment shall be confined to the flagged areas;
3. **Minimize Road Impacts.** New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.
4. **Minimize Traffic Impacts.** Vehicular traffic during project site mobilization, construction and operation shall be confined to existing routes of travel to and from the project site, and cross-country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour on paved or stabilized unpaved roads within the project area, on maintenance roads for linear facilities, or on access roads to the project site. No vehicle shall exceed 10 miles per hour on unpaved areas within the project site, except on stabilized unpaved roads. Project vehicles shall abide by posted speed limits on public paved access roads outside the project site;
5. **Inspect Pipes and Trenches.** At the end of each workday, the Designated Biologist, Biological Monitor, and/or site personnel (approved and trained by

the Designated Biologist) shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If site personnel are inspecting trenches, bores, and other excavations and wildlife is trapped, they will immediately notify the Designated Biologist and/or Biological Monitor. If backfilling is not feasible, all trenches, bores, and other excavations shall be covered to prevent wildlife entrapment or sloped at a 3:1 ratio at the ends to provide wildlife escape ramps. Should wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the animal to a safe location. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed;

6. **Prevent Wildlife Entrapment.** All pipes, tubes, ducting, or other cavities shall be capped to prevent wildfire entrapment. Portable toilets will require vent pipes to be screened to prevent cavity using birds from becoming trapped in the pipes;
7. **Relocate Wildlife.** The Designated Biologist or Biological Monitor shall salvage or relocate sensitive wildlife during ground disturbance activities including clearing, grubbing, and grading operations when feasible to off-site habitat or out of harm's way. The species shall be salvaged or relocated when conditions will not jeopardize the health and safety of the monitor;
8. **Minimize Lighting Impacts.** To minimize adverse effects of artificial light on wildlife, exterior lighting fixtures associated with Project construction shall be downward facing, fully shielded, and designed and installed to minimize backscatter, reflection, minimize skyward illumination, minimize spillover onto adjacent wildlife habitat. Lights used shall be lower on the light spectrum (lower Kelvins with fewer short-wavelength blue light emissions).
9. **Use Non-toxic Soil Binders.** Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants and shall be approved by the CPM prior to use;
10. **Minimize Impacts from Pest Control.** Anticoagulants shall not be used for rodent control. Pre-emergent and other herbicides with documented residual toxicity shall not be used. Herbicides shall be applied in conformance with federal, State, and local laws and according to the guidelines for wildlife-safe use of herbicides in **BIO-9** (Integrated Weed Management Plan);
11. **Minimize Standing Water.** Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards to prevent the formation of puddles, which could attract predators of special-status species to construction sites. During construction, site personnel shall patrol these areas to ensure water does not puddle and attract crows and other wildlife

to the site, and shall take appropriate action to reduce water application rates where necessary;

12. **Handling of Road-killed Animals.** Report all inadvertent deaths of special-status species to the appropriate project representative, including roadkill. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the Monthly Compliance Reports. For special-status species, the Designated Biologist or Biological Monitor shall contact the CPM, CDFW and USFWS within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. Injured animals shall be reported to CPM, CDFW and/or USFWS by the end of the business day per **BIO-2** and the project owner shall follow instructions that are provided by the CPM, CDFW or USFWS. During construction, injured or dead animals detected by personnel in the project area shall be reported immediately to a Biological Monitor or Designated Biologist, who shall remove the carcass or injured animal promptly. During operations, the Project Environmental Compliance Monitor shall be notified and they shall contact the Biological Monitor or Designated Biologist for further instructions. The veterinary fees for the treatment of injured wildlife shall be covered by the project owner for project-related injuries or found injured on the project site.
13. **Minimize Spills of Hazardous Materials.** All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials or wastes. The Designated Biologist shall be informed immediately of any hazardous spills. Any on-site servicing of vehicles or construction equipment shall take place only at a designated area approved by the Designated Biologist. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills;
14. **Remove Trash Daily.** During construction all trash and food-related waste shall be placed in self-closing containers and removed weekly or more frequently from the site. Workers shall not feed wildlife or bring pets to the project site;
15. **No Firearms.** Except for law enforcement or security personnel, no workers or visitors to the site shall bring firearms or weapons to the project site;
16. **Avoid Use of Toxic Substances.** Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants;
17. **Minimize Disturbance Areas.** Limit the size of any vegetation and/or ground disturbance to the minimum area needed for safe completion of project activities, and limit ingress and egress to defined routes;
18. **Weed and Monofilament Free Wattles.** Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations.

Monofilament plastic will not be used for erosion control. In addition, non-native species shall not be used in landscaping plans and erosion control;

19. **Conform to APLIC Guidelines.** Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Reducing Avian Collisions with Power Lines* (APLIC 2012) to reduce the likelihood of large bird electrocutions and collisions;
20. **Aviation Lighting.** To the extent feasible, any aviation warning lighting shall employ only strobed, strobe-like or blinking incandescent or LED lights, preferably with all lights illuminating simultaneously. Minimum intensity, maximum "off-phased" dual strobes are preferred, and no steady burning lights (e.g., L-810s) shall be used;
21. **Herbicide Use.** During construction and operation, the project owner shall conduct pesticide management in accordance with standard BMPs. The BMPs shall include non-point source pollution control measures. The project owner shall use a licensed herbicide applicator and obtain recommendations for herbicide use from a licensed Pest Control Advisor. Herbicide applications must follow EPA label instructions. Minimize use of rodenticides and herbicides in the project area and prohibit the use of chemicals and pesticides known to cause harm to non-target plants and wildlife. The project owner shall only use pesticides for which a "no effect" determination has been issued by the EPA's Endangered Species Protection Program for any species likely to occur within the project area or adjacent wetlands. If rodent control must be conducted, zinc phosphide or an equivalent product shall be used; and
22. **Minimize Stormwater Impacts.** Standard best management practices (BMPs) from the project Storm Water Pollution Prevention Plan shall be implemented during all phases of the project (construction, operation, and decommissioning) where storm water run-off from the site could enter adjacent drainages. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the jurisdictional waters. All disturbed soils within the project site shall be stabilized to reduce erosion potential, both during and following construction.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 60 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written Construction Completion Report identifying how measures have been completed (see Condition of Certification **BIO-7** verification).

Monthly and Annual Compliance Reports will include results of all regular inspections by the Designated Biologist and Biological Monitor(s), including but not limited to the requirements cited above and in Condition of Certification **BIO-2**.

The project owner will maintain written records of vehicle and equipment inspection and maintenance and will provide summaries in each monthly and annual compliance report. The complete written vehicle maintenance record will be available for the CPM's inspection during normal business hours.

HABITAT RESTORATION AND VEGETATION MANAGEMENT PLAN

BIO-8 The project owner shall develop a Habitat Restoration and Vegetation Management Plan (HRVMP or Plan). The HRVMP shall contain all the required restoration activities, measures, seed mixes, proposed cuttings, definition and schedule for all activities associated with vegetation management areas (e.g., fuel management areas and fire breaks), performance criteria, schedules, and reporting requirements, and any proposed remediation activities. No site mobilization or construction activities may occur prior to approval of the final HRVMP by the CPM. The Plan shall be developed by a qualified botanist or restoration ecologist and vegetation management specialist to be approved by the CPM in consultation with CDFW. The Plan shall identify all areas of permanent and temporary impacts, all areas proposed to be managed as fuel breaks, or any area that would not be restored to pre-project conditions (e.g., locations around the wind turbine generators (WTGs), managed fuel breaks, cut and fill areas along roadways, or other managed areas). The Plan shall specify success criteria and materials and methods for site preparation, reseeding, maintaining, and monitoring revegetated areas in the following categories.

A. Temporarily disturbed areas where no future disturbance will occur (e.g., cut and fill slopes along roadways or the removal of riparian habitat at stream crossings). The goal of revegetation on these sites shall be restoration of vegetation and habitat characteristics to provide habitat for species comparable to what is present before the disturbance. Permanent impacts to sensitive or rare communities and riparian areas shall be off-set through compensatory mitigation (see **FOREST-1** and **FOREST-2** and **BIO-31**);

B. Temporarily disturbed areas around turbine pads, roads, or other areas that shall be managed as low growing vegetation, vegetation management areas, or shaded fuel brakes. These areas are defined as locations where future repairs, maintenance, or vegetation management to promote light fuels may necessitate further disturbance during the life of the project. The goal of revegetation on these sites will be to reduce fire risk, minimize dust, erosion, and control the establishment of invasive weeds, but not to restore pre-disturbance habitat values such as replacing conifer woodland habitat. Those impacts are mitigated through off-site compensation (see **FOREST-1**

and **FOREST-2**). Restoration in these areas shall also provide foraging habitat for pollinator species and browse for ungulates and small mammals; and

C. At a minimum, all temporary disturbed areas shall be stabilized with a seed mix consisting of local natives. Riparian areas shall be planted with live cuttings and local native seed mix suitable for riparian habitat.

At a minimum, the HRVMP shall include, but not be limited to the following requirements.

1. The Plan shall include the types and acreages of habitats to be restored. These areas shall be identified on maps with sufficient detail for a desktop review and provided as GIS files. Provide drawings and or schematics outlining the location of seeding and or plantings.
2. Describe the methods of active and passive restoration that may be used depending on site location and habitat.
    a. Active restoration is defined as any area that receives seed or container plants, irrigation (if proposed), weeding, and monitoring.
    b. Passive restoration is defined as any area that is subject to weeding and monitoring. In some areas passive restoration sites may benefit from broadcast seeding prior to the onset of winter rain and snow.

    The methods shall include any proposed site preparation such as topsoil salvage, re-contouring, decompaction, pre-installation weeding, or other proposed methods.
3. Topsoil Salvage requirements. Topsoil and the seed bank it contains, shall be conserved on areas where soil is excavated such as WTG sites, access roads, and transmission pole locations. Salvage shall be accomplished by:
    a. Woody material shall be removed from the soil surface and piled in an area that will be out of the way during construction. Timber shall be removed from the Project site. The upper 6 to 8 inches of soil, where present, shall be scraped from the disturbance footprint and piled into a windrow in an area that will not be disturbed during construction.
    b. Topsoil stockpiles shall be clearly marked for avoidance.
    c. Windrows shall be immediately protected from wind and rain erosion by covering them or hydromulching. Erosion protection shall be renewed as needed.
    d. Salvaged topsoil shall be respread on areas that will be revegetated following construction. Salvaged topsoil versus subsoil shall be used for this purpose unless the location is very weedy.

4. Describe the proposed seed mix, quality control requirements, and application methods such as hydroseeding, broadcast seeding, imprinting, use of container plants, cuttings, or other treatments.
    a. The proposed seed mix shall be acquired from local sources unless approved by the CPM in consultation with the CDFW.
    b. Describe the timing of the seed application and measures to ensure that hydroseeding equipment has been cleaned prior to use on the project site.
    c. The methods shall describe any proposed use of slurry binders, soil stabilizers, and use of mycorrhizal fungi.
    d. Describe the proposed timing of the seeding and other restoration efforts such as container plantings, cuttings, or other methods.
5. The HRVMP shall include success criteria and percent cover for each of the proposed treatment areas. Success criteria will be based on the composition of native species designed for each area (e.g., restored versus managed areas) and shall meet these minimum standards.
    a. After five years riparian areas shall be on a trend to meet baseline conditions or better (compared to adjacent stream habitat) and consist of no more than 10 percent exotic species. Plants with a moderate of high threat rate shall not exceed 5 percent. Species diversity should not be dominated by a single species.
    b. Upland areas shall be dominated by annuals, forbs, and low growing perennials and consist of no more than 10 percent exotic species. The project owner shall provide the rationale for expected percent cover and species composition based on pre-project conditions, adjacent reference sites, or other measurable metric. Percent cover shall be described in the plan and meet a minimum cover tied to habitat in similar undisturbed or managed habitat.
    c. Fuel management zones shall be planted to promote low growing species including annuals, forbs, low shrubs, and native grasses. Species composition shall be focused on enhancing pollinator species use while reducing fire and erosion risk. Vegetation in this area shall consist of no more than 10 percent exotic species (without authorization from the CPM in consultation with CDFW). Plants with a moderate of high threat rate shall not exceed 5 percent.
6. The HRVMP shall include a defined implementation schedule and plan including any restoration activities including conducting biological or cultural resources clearance surveys, avian monitoring, or other condition of certification requirements; ensuring soil conditions are

prepared for treatment, and the implementation of any required erosion control devices.

7. Maintenance and Monitoring. Each restoration site shall be monitored and maintained over a minimum 5-year monitoring period. During this period, herbaceous and shrubland vegetation should approach structure and function comparable to similar undisturbed habitats in the area that are in same general stage of succession.

8. All work areas shall be clearly delineated prior to restoration work, and This shall include any; soil preparation measures, including locations of recontouring, de-compacting, imprinting, or other treatments; details for topsoil storage, as applicable; plant material collection and acquisition guidelines, plants from the project site, as well as obtaining replacement plants from outside the project area (sources for plant materials will be limited to locally occurring native species from the local area if needed for riparian and oak species); a plan drawing or schematic depicting the temporary disturbance areas described above; time of year that the planting or seeding will occur and the methodology of the planting; a description of the irrigation, if used; success criteria; a monitoring program to measure the success criteria, commensurate with the Plan's goals and contingency measures for failed revegetation efforts not meeting success criteria.

9. Plant acquisition shall be limited to locally collected seed and cuttings.

10. At final grade, the last few inches shall not be compacted to more than 75 percent to facilitate penetration by plant roots. Salvaged topsoil shall be spread over the finish grade. The grade shall not be completely smoothed. Small ridges shall be provided for seedling wind protection and to collect moisture from rain and fog. Hydroseed with soil stabilization seed mixture shall be applied between October 1 and mid-November unless the restoration biologists provides justification to the CPM to alter the timing of the application. The hydroseed mix shall contain a mulch and binder to retard wind erosion by providing a crust over the soil surface. Native plant seeds shall be added to the hydroseed mixture or hand broadcasted onto the site just prior to hydroseeding. Care shall be taken to avoid premature germination of native species caused by prolonged immersion in the hydroseed device. On slopes, the project owner shall augment the erosion control seed mixture with seed of native coastal scrub species native to the site and collected from the project region. Appropriate seed mixtures for use on grassland and coastal scrub areas shall be developed in consultation with and approved by CPM and CDFW using seed of native species originating from the region.

11. The restoration areas shall be monitored for a minimum of 5 years by a qualified botanist or restoration ecologist. Weed control shall be started

within 3 months of planting, or earlier if weeds have begun to flower. Weeding shall proceed as frequently as necessary to prevent weeds from spreading off the project site into the adjacent area and to prevent seed set. An effort shall be made to cut weeds before they develop seeds to minimize the spread of invasive weeds. Any new weed species not currently present in the project area prior to construction shall be eradicated (see **BIO-8** and **BIO-9**). At the end of the five-year monitoring period the qualified botanist or restoration ecologist in consultation with the Designated Biologist shall prepare a monitoring report detailing the success of the restoration efforts and shall provide recommendations, if needed. This monitoring report shall be submitted to the CPM for review and approval and CDFW for review and comment.

12. Monthly, quarterly, and annual restoration status reports shall include a map of all areas planted or managed, percent weed cover, status of restoration efforts including percent native cover and survivorship, and any remedial actions taken.

Verification: The project owner shall submit the draft HRVMP to the CPM for approval and the CDFW for review and comment at least 45 days prior to start of any site mobilization. The project owner shall provide final HRVMP to the CPM and CDFW at least 7 days prior to start of any site mobilization. Any changes to the approved HRVMP must be approved by the CPM in consultation with CDFW. Monthly, quarterly, and annual restoration status reports shall be submitted to the CPM for review and approval and to the CDFW for review and comment no more than 30 days after each reporting period.

INTEGRATED WEED MANAGEMENT PLAN

BIO-9 The project owner shall develop an Integrated Weed Management Plan (IWMP) Plan. The IWMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of weed locations across the project site. The IWMP shall be submitted to the CPM for approval and the CDFW and USFWS for review and comment. The IWMP shall contain all required measures to identify, control, and manage existing and potential weed infestations on the project site. No site mobilization, ground disturbance, or construction activities may occur prior to approval of the final IWMP by the CPM.

The IWMP shall describe the methods of preventing or controlling the introduction or spread of weeds or new weed infestations. For the purposes of the IWMP, “weeds” shall include designated noxious weeds, as well as any other non-native weeds or pest plants identified on the weed lists of the California Department of Food and Agriculture or the California Invasive Plant Council. The IWMP shall be implemented prior to any site mobilization, and during the construction, operation, and decommissioning phases of the project. The IWMP shall include the information listed in the following paragraphs.

The IWMP shall provide an assessment of the project's potential to cause spread of invasive nonnative weeds into new areas, or to introduce new non-native invasive weeds into the project site. This section must list known and potential non-native and invasive weeds occurring on the project site and in the project region and identify threat rankings and potential consequences of project-related occurrence or spread for each species. This assessment shall include, but is not limited to, weeds that (1) are rated high or moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC, 2021), and (2) aid and promote the spread of wildfires, and (3) have the potential to displace native vegetation communities. This section shall identify goals for control of each species (e.g., eradication, suppression, or containment) likely to be found within the project area.

1. The project owner shall inventory the entire project site, including all areas subject to ground-disturbing activity, including, but not limited to, construction work sites, staging areas, and any potential new or improved access roads. Weed occurrences shall be mapped and described according to density and area covered. The map shall be updated at least once a year during the construction phase.
2. Weed infestations identified in the preconstruction weed inventory shall be evaluated to identify potential for project-related spread. The IWMP shall identify any infestations to be controlled or eradicated prior to project construction, or other site-specific weed management requirements (e.g., avoidance of soil transport and site-specific vehicle washing where threat or spread potential is high). The CPM will be notified within 30 days if any weed species detected on the project site has not been previously recorded in Shasta County. Control and follow-up monitoring of preconstruction weed treatment sites will follow methods identified in appropriate sections of the IWMP.
3. The IWMP shall specify methods to minimize potential transport of weed seeds onto the Project site, or from one section of the Project site to another. The Project site may be divided into "weed zones," based on known or likely invasive weeds in any portion of the Project site. The IWMP will specify inspection procedures for construction materials and equipment entering the Project area. Vehicles and equipment shall be inspected and cleaned at entry points to specified portions of the Project site, and before leaving work sites where weed occurrences must be contained locally.
4. Construction equipment shall be cleaned of dirt and mud that could contain weed seeds, roots, or rhizomes. Equipment shall be inspected to ensure it is free of any dirt or mud that could contain weed seeds, and the tracks, outriggers, tires, and undercarriage will be carefully washed, if needed, with special attention being paid to axles, frame, cross members, motor mounts, underneath steps, running boards, and front

bumper/brush guard assemblies. Other construction vehicles (e.g., pick-up trucks) that will be frequently entering and exiting the site will be inspected and washed on an as-needed basis. Tools such as chainsaws, hand clippers, pruners, etc., shall be cleaned of dirt and mud before entering Project work areas.

5. All vehicles shall be washed off-site when possible. If off-site washing is infeasible, on-site cleaning stations will be set up at specified locations to clean equipment before it enters the work area. Wash stations shall be located away from native habitat or special-status species occurrences. Wastewater from cleaning stations will not be allowed to run off the cleaning station site. When vehicles and equipment are washed, a daily log shall be kept stating the location, date and time, types of equipment, methods used, and personnel present.
6. Erosion control materials (e.g., straw wattles, hay bales) must be certified free of weed seed before they are brought onto the site. The IWMP must prohibit on-site storage or disposal of mulch or green waste that may contain weed material. Mulch or green waste shall be removed from the site in a covered vehicle to prevent seed dispersal and transported to a licensed landfill or composting facility.
7. The IWMP shall specify guidelines for any soil, sand, gravel, mulch, or fill material to be imported into the project area, transported from site to site within the Project area, or transported from the Project area to an off-site location, to prevent the introduction or spread of weeds to or from the Project area.
8. The IWMP shall specify methods to survey for weeds during construction and operation; and shall specify qualifications of botanists responsible for weed monitoring and identification. The botanists shall be approved pursuant to **BIO-3**. It must include a monitoring schedule to ensure timely detection and immediate control of weed infestations to prevent further spread. Surveying and monitoring for weed infestations shall occur at least two times per year, to coincide with the early detection period for early season and late season weeds (i.e., species germinating in winter and flowering in late winter or spring, and species germinating later in the season and flowering in summer or fall). It also must include methods for marking invasive weeds on the project site and recording and communicating these locations to weed control staff. The map of weed locations (discussed above) shall be updated at least once a year and made available to the CPM in Arc-GIS formatting and pdf maps. The monitoring section shall also describe methods for post-eradication monitoring to evaluate success of control efforts and any need for follow-up control.
9. The IWMP must specify manual and chemical weed control methods to be employed. The IWMP shall include only weed control measures with a

demonstrated record of success for target weeds, based on the best available information. The plan shall describe proposed methods for promptly scheduling and implementing control activity when any weed infestation is located, to ensure effective and timely weed control. Weed infestations must be controlled or eradicated as soon as possible upon discovery, and before they go to seed, to prevent further spread. All proposed weed control methods must minimize the extent of any disturbance to native vegetation, limit ingress and egress to defined routes, and avoid damage from herbicide use or other control methods to any environmentally sensitive areas identified within or adjacent to the Project site. Herbicide use must comply with the following restrictions unless approved by the CPM in consultation with CDFW.

a. Herbicide applicators must follow the best management practices described by the Guidance to Protect Habitat from Pesticide Contamination.

b. Avoid using pesticides marked with the US Environmental Protection Agency's bee hazard icon.

c. Avoid spraying pesticides onto any flowering plant, with special care to avoid taxa indicated above.

d. Use pesticides with a short residual toxicity to bees- pesticide toxicity to bees can be checked via UC ANR's Bee Precaution Database.

e. Use targeted application instead of broadcast spraying whenever possible.

f. Avoid mixtures of pesticides as they are only evaluated in scenarios in which they are not combined, therefore potential harmful synergies are also unknown.

g. All pesticide application must be conducted by a Licensed and Certified Pesticide Applicator and should be used as directed by the manufacturer.

10. Weed infestations shall be treated at a minimum of once annually until eradication, suppression, or containment goals are met. For eradication, when no new seedlings or resprouts are observed for three consecutive, normal rainfall years, the weed occurrence can be considered eradicated and weed control efforts may cease for the site.

11. Manual control shall specify well-timed removal of weeds or their seed heads with hand tools; seed heads and plants must be disposed of in accordance with guidelines from the Shasta County Agricultural Commissioner, if such guidelines are available.

12. The chemical control section must include specific and detailed plans for any herbicide use. It must indicate where herbicides will be used, which herbicides will be used and specify techniques to be used to avoid drift

or residual toxicity to native vegetation or special-status plants and wildlife. Only state-approved herbicides may be used. Herbicide treatment will be implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of predicted rain. Only water-safe herbicides shall be used in riparian areas or within channels (engineered or not) where they could run off into downstream areas. Herbicides shall not be applied when wind velocities exceed six (6) mph. All herbicide applications will follow U.S. Environmental Protection Agency label instructions and will be in accordance with federal, state, and local laws and regulations. Any herbicide proposed for usage must be approved in advance by the CPM in coordination with the CDFW and USFWS.

13. The IWMP shall specify a reporting schedule (no less than one annual report) and contents of each report that shall be prepared by the project owner to document weed control efforts.

Verification: The project owner shall submit the draft IWMP to the CPM for review and approval and to the CDFW and USFWS for review and comment at least 45 days prior to start of any site mobilization activities. The project owner shall provide final IWMP to the CPM, CDFW, and USFWS at least 7 days prior to start of any site mobilization. Any changes to the approved IWMP must be approved by the CPM in consultation with CDFW and USFWS.

INVASIVE SPECIES MANAGEMENT PLAN

BIO-10 The project owner shall develop an Invasive Species Management Plan (ISMP) Plan. The ISMP shall be prepared in consultation with the Designated Biologist and shall include an education program (see **BIO-5**) to describe the risk that invasive species pose to native wildlife and the control methods that will be required during implementation of the project. The ISMP shall be submitted to the CPM for approval and the CDFW and USFWS for review and comment. The ISMP shall include the following.

Invasive Species Education Program. The program shall consist of a presentation from the Designated Biologist or Biological Monitor(s)that includes a discussion of the invasive species currently present within the Project site as well as those that may pose a threat to or have the potential to invade the Project site. The discussion shall include a physical description of each species and information regarding their habitat preferences, local and statewide distribution, modes of dispersal, and impacts. The program shall also include a discussion of best management practices (BMPs) to be implemented at the Project site to avoid the introduction and spread of invasive species into and out of the Project site. Provide interpretation for non-English speaking workers, and the same instruction shall be included for any new workers prior to their performing any work within the Project site. The program shall be repeated annually for projects extending more than one year. Copies of program materials shall be maintained

at the Project site for workers to reference as needed. The program shall be included as part of the WEAP required under **BIO-5**.

1. **Invasive Species.** The ISMP will describe the activities that prevents the introduction, transfer, and spread of invasive species, including plants, animals, and microbes (e.g., algae, fungi, parasites, bacteria, etc.), from one Project site and/or waterbody to another. If decontamination is not done on site, transport contaminated equipment in sealed plastic bags and keep separate from clean gear. When practical, in flowing water work shall begin upstream and work downstream. This avoids transporting aquatic invasive species to non-infested upstream areas. For locations known to be infested with invasive species, use dedicated equipment that is only used in infested waters. Store this equipment separately. Prevention BMPs and guidelines for invasive plants can be found on the California Invasive Plant Council's website at: http://www.cal-ipc.org/ip/prevention/index.php and for invasive mussels and aquatic species can be found at the Stop Aquatic Hitchhikers website: http://www.protectyourwaters.net/.
2. **Inspection of Project Equipment.** Inspect all vehicles, tools, waders, and boots, and other project-related equipment and remove all visible soil/mud, plant materials, and animal remnants. All water must be drained from equipment that will work prior to entering and exiting the Project site and/or between each use in different waterbodies.
3. **Decontamination of Project Equipment.** All tools, waders and boots, and other equipment that will enter the Project site and/or between each use in different waterbodies, shall be decontaminated to avoid the introduction and transfer of organisms between waterbodies. Gear and equipment can be decontaminated utilizing one of three methods: drying, using a hot water soak, or freezing, as appropriate to the type of gear or equipment shall be decontaminated. For all methods, begin the decontamination process by thoroughly scrubbing equipment, paying close attention to small crevices such as boot laces, seams, net corners, etc., with a stiff-bristled brush to remove all organisms. To decontaminate by drying, allow equipment to dry thoroughly (i.e., until there is a complete absence of water), preferably in the sun, and keep dry for a minimum of 48 hours. To decontaminate using a hot water soak, immerse equipment in 140°F or hotter water and soak, completely submerged, for a minimum of 5 minutes. To decontaminate by freezing, place equipment in a freezer 32°F or colder for a minimum of 8 hours. Repeat decontamination is required only if the equipment/clothing is removed from the site, used within a different waterbody, and returned to the Project site or different waterbody.
4. **Decontamination of Vehicles and Equipment.** Vehicles and other project-related equipment too large to immerse in a hot water bath shall

be decontaminated by pressure washing with hot water a minimum of 140°F at the point of contact or 155°F at the nozzle. Additionally, flush pumps and other equipment that may be used in aquatic areas (e.g., trash pumps, pumps, bilges, etc.) for a minimum of 10 minutes. Following the hot water wash, drain water and dry all vehicles, watercraft, and other large equipment as thoroughly as possible.

5. **Decontamination Sites.** The Project owner shall identify a decontamination site approved by the CPM and CDFW. The Project owner shall perform decontamination of vehicles, watercraft, and other Project-related gear and equipment in a designated location where runoff can be contained and not allowed to pass into CDFW jurisdictional areas and other sensitive habitat. Preferably this will consist of an off-site location such as a construction yard or other approved vehicle washing location. Rinse water shall be disposed of at least 100 feet from any surface water.

6. **Notification of Invasive Species.** The Project owner or Designated Biologist shall notify the CPM and CDFW within 24-hours if an invasive species not previously known to occur within the Project site is discovered during Project activities. The report shall include photos and a completed Suspect Invasive Species Report (available online at: https://www.wildlife.ca.gov/Conservation/Invasives/Report). In addition, the Project owner or designated Biologist shall provide an email to the Invasive Species Program at: invasives@wildlife.ca.gov. Notification may also be provided by calling (866) 440-9530. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.

Verification: The project owner shall submit the draft ISMP to the CPM for review and approval and to the CDFW and USFWS for review and comment at least 45 days prior to start of any site mobilization activities. The project owner shall provide the final ISMP to the CPM, CDFW, and USFWS at least 7 days prior to start of any site mobilization. No site mobilization, ground disturbance, or construction activities may occur prior to approval of the final ISMP by the CPM.

CONDUCT BIOLOGICAL MONITORING DURING CONSTRUCTION

BIO-11 The project owner shall ensure the Designated Biologist and/or Biological Monitors conduct biological monitoring during all site mobilization, vegetation clearing, ground disturbance, construction, and any activities that have the potential to result in direct or indirect impacts to sensitive plants and wildlife. The Designated Biologist shall ensure that adequate numbers of monitors are assigned to effectively monitor work activities and that communications from biological monitors are promptly directed to crews at each work site for incorporation into daily work activities. The Designated Biologist shall ensure that biological monitors are provided with an accurate daily construction work

schedule as well as updated information on any alterations to the daily construction work schedule. The Designated Biologist shall ensure that biological monitors are provided with up-to-date biological resource maps and construction maps in hardcopy or digital format.

Biological monitors can be designated as species specific Authorized or Designated Biologists who have demonstrated expertise with a particular species or Approved Biological Monitors who have general knowledge with the resources known to occur in the project Area. The Authorized or Designated Biologist may be the same lead biologist as described in **BIO-1**. Throughout the duration of construction, Authorized/Acceptable Biologist(s) shall conduct biological monitoring of all work activities in the Project area, including work sites, staging areas, access roads, and any area subject to Project disturbance. All pre-construction activities (e.g., for geotechnical borings, etc.) and post-construction restoration (if any) shall also be monitored by a biological monitor or lead biologist. The CPM will approve any proposed biological monitors, per **BIO-3**, in coordination with the CDFW and USFWS. These measures shall be incorporated into the BRMIMP and implemented.

Biological monitors have the following responsibilities.

1. Monitors are responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided or fully minimized safely possible consistent with approved work limits and permit conditions. Monitors are also responsible to ensure that work activities are conducted in compliance with all conditions of certification (COCs), permit conditions, and other project requirements.
2. Biological monitors shall inform construction crews daily of any environmentally sensitive areas (ESAs), nest buffers, or other resource issues or restrictions that affect the work sites for that day. Biological monitors shall communicate with construction supervisors and crews as needed (e.g., at daily tailgate safety meetings (“tailboards”), by telephone, text message, or email) to provide guidance to maintain compliance with COCs and permit conditions. If biological monitors are unavailable for a tailboard meeting, the construction supervisors shall communicate all ESAs, nest buffers, or other resource restrictions to crews during the meeting.
3. Monitors shall be familiar with the biological resources present or potentially present, ESAs, nest buffers, and any other resource issues at the site(s) they are monitoring, as well as the applicable COCs and permit requirements. Monitors shall exhibit diligence in their monitoring duties and refrain from any conduct or potential conflict of interest that may compromise their ability to effectively carry out their monitoring duties.

4. Each day, prior to work activities at each site, a biological monitor shall conduct clearance surveys ("sweeps") for sensitive plant or wildlife resources that may be located within or adjacent to the construction areas. If sensitive resources are found, the biological monitor shall take appropriate action as defined in all COCs, approved lands, and permit conditions. Work activities shall not commence at any work site until the clearance survey has been completed and the biological monitor communicates to the contractor that work may begin.
5. Biological monitors shall clearly mark sensitive biological resource areas with staking, flagging, or other appropriate materials that are readily visible and durable. The monitors shall inform work crews of these areas and the requirements for avoidance and shall inspect these areas at appropriate intervals for compliance with regulatory terms and conditions. The biological monitors shall ensure that work activities are always contained within approved disturbance area boundaries.
6. Biological monitors shall have the authority and responsibility to halt any project activities that are not in compliance with applicable COCs, Plans, permit conditions, or other Project requirements, or will have an unauthorized adverse effect on biological resources. See **BIO-4**.
7. Handling, relocation, release from entrapment, or other interaction with wildlife shall be performed consistent with COCs, Plans, safety protocols, permits, and other Project requirements (and only done by an Authorized Biologist approved by the CPM).
8. Biological monitors shall use handling measures that are safe, practicable, and consistent with COCs, Plans, safety protocols, and permit conditions, to actively or passively relocate wildlife out of harm's way. Daily, biological monitors shall inspect construction areas where animals may have become trapped, including equipment covered with bird exclusion netting (if any), and release any trapped animals. Daily inspections and sweeps shall also include areas with high vehicle activity (e.g., staging areas), to locate animals in harm's way and relocate them if necessary. If safety or other considerations prevent biological monitors from aiding trapped wildlife or wildlife in harm's way, the project owner shall consult with the construction contractor, CDFW, wildlife rehabilitator, or other appropriate party to obtain aid for the animal, consistent with applicable mitigation measures.
9. At the end of each workday, biological monitors shall verify that all excavations, open tanks, trenches, pits, or similar wildlife entrapment hazards have been covered or have ramps installed to prevent wildlife entrapment and communicate with work crews to ensure these structures are installed and functioning properly.

10. Biological monitors shall inspect any wildlife exclusion fencing (if used) daily to ensure that it remains intact and functional. Any need for repairs to exclusion fencing shall be immediately communicated to the responsible party, and repairs shall be carried out in a timely manner, generally within one workday.
11. The project owner shall prepare and implement a procedure for communication among biological monitors and construction crews, to ensure timely notification (i.e., daily or sooner, as needed) to crews of any resource issues or restrictions.
12. Monitoring activities shall be thoroughly and accurately documented daily using an electronic monitoring system such as Fulcrum or other CPM approved monitoring application. The monitoring system shall document:
    a. Weather conditions and daily construction tasks completed;
    b. A recordation of all wildlife species observed;
    c. Any species status species observed including location of observation, location and description of Project activities in the vicinity, and any avoidance or other measures taken to avoid the species;
    d. Verify compliance or document any non-compliance incidents, including nest buffer incursions, with resolution or remedial actions taken;
    e. Any bird nesting activities and locations of potential nests; and
    f. Ability to take photo documentation;
    g. In addition, all special-status species observations shall be reported to the California Natural Diversity Database (CNDDB).

Verification: The project owner shall submit the monthly and annual monitoring reports as part of the Monthly Compliance Report and Annual Compliance Report to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 30 days after each reporting period. Electronic records of daily monitoring reports will be provided to the CPM on request within 48 hours.

SPECIAL-STATUS PLANT AVOIDANCE MEASURES

BIO-12 The Designated Biologist and/or Biological Monitor(s) shall conduct floristic pre-construction surveys for special-status plants. All surveys shall be conducted by qualified biologists or botanists in accordance with the appropriate protocols. Surveys shall be conducted during the appropriate season in all suitable habitat located within the project disturbance areas and access roads and within 100 feet of disturbance areas. Surveys shall be conducted by qualified botanists or biologists approved by the CPM, pursuant to **BIO-1** and/or **BIO-3**. The field surveys and reporting must conform to current CDFW botanical field survey

protocol (CDFW2018) or more recent updates, if available. Surveys are required for any area that has not previously been surveyed within three years. During each year of construction, prior to ground disturbance the project owner shall submit a proposed survey plan to the CPM for review and approval and the CDFW for review and comment prior to initiating annual botanical surveys. The Plan shall identify proposed survey areas and the rationale for any areas not proposed for surveys. The Plan shall include maps and GIS data clearly defining each proposed survey area.

Any special-status plant species (including state and federally listed threatened or endangered species, candidates for listing, and all CRPR 1A, 1B, 2, 3, and 4 ranked species) detected shall be documented in preconstruction survey reports. The results shall be submitted to CPM and CDFW. The reports shall describe any conditions that may have prevented target species from being located or identified, even if they are present as dormant seed or below-ground root stock (e.g., poor rainfall, heavy snow, logging, or wildfire). In some cases, follow-up surveys may be necessary to adequately evaluate impacts. Pre-construction field survey reports shall include maps showing locations of survey areas and special-status plants. Avoidance and mitigation options are described below.

1. **Avoidance.** Where feasible, any special status plant shall be protected by a 50-foot non-disturbance buffer. The buffer area shall be clearly staked, flagged, and signed for avoidance prior to the beginning of site mobilization and maintained throughout the construction phase. The buffer zone shall be of sufficient size to prevent direct or indirect disturbance to the plants from construction activities, erosion, inundation, or dust. The size of the buffer shall depend upon the proposed use of the immediately adjacent lands and the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, water availability, edaphic physical and chemical characteristics), to be specified by a qualified biologist or botanist. At minimum, the buffer for tree or shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) to protect and preserve the root systems. The buffer for herbaceous species shall be a minimum of 50 feet from the perimeter of the occupied habitat or the individual. If a smaller buffer is necessary due to other project constraints, the project owner, in coordination with the Designated Biologist or Designated Botanist and CPM, shall develop and implement site-specific monitoring and put other measures in place to avoid the take of the species, if possible, in consultation with CDFW.

2. **Compensatory Mitigation.** The project owner shall mitigate impacts to any state or federally listed plants that are subject to disturbance and if more than 10 percent of an CRPR 1 or 2 ranked plant occurrence is subject to loss from project disturbance where direct or indirect effects to soils, vegetation, or water transport could affect the species. The local

population shall be measured by the number of individuals occurring on the project site and within the immediate watershed of the project for stream dependent-species or species of unknown dispersal mechanism. Otherwise, all plants within a 0.25-mile buffer shall be considered part of the occurrence. Measurement of percent avoidance shall be based on population for perennials and on habitat for annuals (habitat containing the species' micro-habitat preferences, such as "soil types and moist depressions"). The project owner shall provide compensation lands for impacts to any state or federally listed plants and CRPR 1 or 2 ranked plants at a 3:1 (State or federally listed) and a 2:1 ratio for CRPR 1 or 2 ranked species, consisting of habitat occupied by the impacted acreage and number of plants for any occupied habitat affected by the project. Occupied habitat will be calculated on the project site and on compensation lands as including each special status plant occurrence and a surrounding 100-foot buffer area to account for seed bank.

3. **Compensatory Mitigation by Acquisition:** The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all the following:

a. **Selection Criteria for Acquisition Lands.** The compensation lands selected for acquisition may include any of the following three categories:

b. **Occupied Habitat, No Habitat Threats.** The compensation lands selected for acquisition shall be occupied by the target plant population and shall be characterized by site integrity and habitat quality that are required to support the target species and shall be of equal or better habitat quality than that of the affected occurrence. The occurrence of the target special-status plant on the proposed acquisition lands should be viable, stable, or increasing (in size and reproduction).

c. **Occupied Habitat, Habitat Threats.** Occupied compensation lands characterized by habitat threats may also be acquired if the population could be reasonably expected to recover with habitat restoration efforts (e.g., OHV or grazing exclusion, or removal of invasive non-native plants) and is accompanied by a Habitat Enhancement/Restoration Plan.

d. **Unoccupied but Adjacent.** The project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat. This acquisition may include habitat restoration efforts where appropriate, particularly when these restoration efforts will benefit adjacent habitat that is occupied by the target species.

4. **Review and Approval of Compensation Lands Prior to Acquisition.** The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above and must be approved by the CPM.

5. **Management Plan.** The project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the CPM.

6. **Integrating Special-Status Plant Mitigation with Other Mitigation lands.** If all or any portion of the acquired Forest Mitigation, Waters of the State, or other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

7. **Compensation Lands Acquisition Requirements.** The project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

    a. **Preliminary Report.** The project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

    b. **Title/Conveyance.** The project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFW, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM/USFS or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFW or another entity approved by the CPM. If an entity other than CDFW holds a conservation easement

over the compensation lands, the CPM may require that CDFW or another entity approved by the CPM, in consultation with CDFW, be named a third-party beneficiary of the conservation easement. The project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. **Initial Protection and Habitat Improvement.** The project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. A non-profit organization, CDFW or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFW, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee.

d. **Property Analysis Record.** Upon identification of the compensation lands, the project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

e. **Long-term Maintenance and Management Funding.** The project owner shall deposit in an Account, or other CPM approved entity, a capital long-term maintenance and management fee in the amount determined through the Property Analysis Record (PAR) or PAR-like analysis conducted for the compensation lands.

The CPM, in consultation with CDFW, may designate another non-profit organization to hold the non-refundable, long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision. In addition to the costs listed above, the project owner shall be responsible for

all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFW or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

f. **Mitigation Security.** The project owner shall provide financial assurances to the CPM and the CDFW to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing project activities. Financial assurances shall be provided to the CPM and the CDFW in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR report. Prior to submitting the evidence of Security to the CPM and the CDFW, the project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security or approve of the security beneficiary to draw on the security, if the CPM determines the project owner has failed to comply with the requirements specified in this condition. The CPM and CDFW may use money from the Security solely for implementation of the requirements of this condition. The CPM's and CDFW's, or other approved legal entities use of the Security to implement measures in this condition may not fully satisfy the project owner's obligations under this condition, and the project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the project owner in whole or in part upon successful completion of the associated requirements in this condition.

8. **Monitoring.** Annual monitoring and documentation of salvaged plants shall include, but not be limited to, details of plants salvaged, stored, and transplanted (salvage and transplanting locations, species, number, size, condition, etc.); adaptive management efforts implemented (date, location, type of treatment, results, etc.); and evaluation of success of transplantation. Transplanted species may not be placed in areas subject to future logging and must be protected by a conservation easement. Annual monitoring shall occur for a minimum of three years to ensure the plants become established and are not at risk from weeds or other impacts. The results of annual monitoring shall be reported in an Annual Monitoring Report for a minimum of three years. Additional monitoring may be necessary if determined upon review of the annual reports by the CPM, in coordination with CDFW, that the

success criteria are not met. Success criteria would include maintaining habitat occupied by the impacted species at the identified ratios and number of plants for any occupied habitat affected by the project.

9. **Horticultural propagation and off-site introduction.** If salvage and relocation is not believed to be feasible for special-status plants, then the project owner shall consult with California Botanic Garden, or another qualified entity, to develop an appropriate propagation and relocation strategy, based on the life history of the species affected. The Plan shall include at minimum: (a) collection and salvage measures for plant materials (e.g., cuttings), seed, or seed banks, to maximize success likelihood; (b) details regarding storage of plant, plant materials, or seed banks; (c) location of the proposed propagation facility, and proposed methods; (d); time of year that the salvage and other practices will occur (e) success criteria; and (f) a detailed monitoring program, commensurate with the Plan's goals.

Verification: The project owner shall submit the proposed annual survey plan 45 days prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment. The project owner shall submit the results of each annual survey to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 45 days after the completion of the surveys. The project owner shall submit the monthly, quarterly, and annual monitoring reports to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 30 days after each reporting period.

WESTERN AND CROTCH'S BUMBLE BEE AVOIDANCE MEASURES

BIO-13 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for Crotch's bumble bee and western bumble bee prior to site mobilization and during all ground disturbing activities if project activities are scheduled to begin or are ongoing during the colony active period (April 1 through August 31). The surveys shall be conducted by a qualified entomologist(s) or biologist(s) familiar with the life history and ecology of Crotch's and western bumble bee. All proposed surveyors must be approved by the CPM in coordination with the CDFW, pursuant to **BIO-1** and/or **BIO-3**. Surveys shall cover all project work areas, including staging and parking areas, plus a 50-foot buffer. Surveys shall follow non-invasive protocols established by CDFW in "Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species" or more recent CDFW-approved methods if they become available prior to project implementation (CDFW 2023d).

During each year of construction, prior to ground disturbance the project owner shall submit a proposed survey plan to the CPM for review and approval and the CDFW for review and comment prior to initiating surveys. The Plan shall identify proposed survey areas and the rationale for any areas not proposed for surveys.

The Plan shall include maps and GIS data clearly defining each proposed survey area.

Survey methods shall include a minimum of three on-site surveys spaced two to four weeks apart and should be developed to detect foraging bumble bees and potential nesting sites. If handling is required for identification, it shall only be conducted by a person possessing a 2081(a) Memorandum of Understanding (MOU) from CDFW. Otherwise, bumble bees observed during the surveys shall be photographed in the open for identification. Should a Western or Crotch's bumble bee be detected:

1. If any western or Crotch's bumble bees are detected during surveys, the Designated Biologist shall notify the CPM and CDFW within 24 hours. The notification shall include the location and number of bumble bees detected and the protective measures that have been implemented. A written report shall be provided within 5 working days that includes a map of the location.
2. If western or Crotch's bumble bee(s) are observed foraging within the project site, work activities at the location shall pause until the bee moves outside the project site.
3. If an active western or Crotch's bumble bee nest is identified during the surveys, a 50-foot non-disturbance buffer shall be clearly delineated with staking, flagging, and/or signage and project activities shall be prohibited from the area until it is determined that the nest is no longer active. If any active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest(s) that would be avoided during project construction. The Designated Biologist and/or Biological Monitor(s) shall remain onsite throughout the duration of activities occurring within the immediate area of the established avoidance buffer to ensure that impacts to the nesting site are avoided.
4. If the nest cannot be avoided the project owner and Designated Biologist shall coordinate with the CPM and CDFW to devise a salvage plan. The Plan would identify the methods for capture and relocation if there is a reasonable expectation for survival and relocation. This condition would allow no more than two nests to be lost or relocated. Mitigation for the loss of a bumble bee nest would be implemented through the enhancement of native floral resources known to be used by the species included as part of **BIO-8** and land acquisition associated with **FOREST-1** and **FOREST-2**. If any mortality to western or Crotch's bumble bees is detected the project owner and Designated Biologist would be required to contact the CPM and CDFW to implement supplemental mitigation measures

5. Survey results shall be submitted to the CPM and CDFW prior to the initiation of ground-disturbing activities and shall include the following:
    a. Names of surveyors and, if applicable, names of biologist(s) determining identification.
    b. Location (latitude and longitude) and extent of surveyed areas with maps.
    c. Description of conditions during each survey: date, time, temperature, wind speed.
    d. Detailed habitat assessment including percent cover of floral resources and potential nesting and overwintering habitat.
    e. Number of surveyors per acre, number of acres surveyed, amount of time of focused surveys and the list of plant species identified that could provide floral resources for either species and whether bees were observed on them.
    f. Nesting habitat surveys: type of nest/structure surveyed and if bees were found in them, number of nests found in project site, photo log of suitable habitat and plants.
    g. Photo vouchers of bumble bees for identification and confirmation that photo vouchers were submitted and candidate bumble bees were identified, if applicable.
6. Survey data shall be submitted to the CNDDB and shall include specifying the type of observation (individual bee/nest), type of vegetation cover, slope, aspect, GPS location, distance to foraging location (if known), and other relevant conditions noted. Negative survey results shall also be reported.

Verification: The project owner shall submit the names and credentials of the qualified entomologist(s) conducting the surveys for western and Crotch's bumble bee to the CPM for review and approval and the CDFW for review and comment no less than 45 days prior to the surveys. The project owner shall submit the proposed annual survey plan 45 days prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment. The project owner shall submit the results of each annual survey to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 45 days after the completion of the surveys.

The project owner shall submit information describing the findings of the bumble bee surveys and implementation of any avoidance measures in the Monthly Compliance Report (MCR) (per **BIO-6**) to the CPM and CDFW.

INSECT MORTALITY AND MONITORING PLAN

BIO-14 The project owner shall develop an Insect Mortality and Monitoring Plan (IMMP) Plan. The IMMP shall be prepared in consultation with the Designated

Biologist and shall be provided to the CMP for review and approval and CDFW and USFWS for review and comment prior to operation of the wind turbine generators (WTGs). The IMMP shall include the following.

1. **Mortality Sampling Plan.** The Plan shall include a rigorous mortality sampling plan for special status invertebrates. The Plan will describe the location and methods for sampling and shall include a description of the methods to search for the remains of special status invertebrates that may have been subject to collision with the WTGs. Sampling shall be conducted during periods of peak insect migration only and during periods of low winds when insect remains may have fallen within the rotor swept area. Sampling methods shall include walking the substrate and carefully searching the ground or other CPM approved methods. Sampling shall occur in a representative subset of WTG locations across the entire project site and include reference areas located outside of potential insect drift areas.
2. **Reporting.** The project owner will prepare a Spring, Summer, and Fall Report documenting the types of insects that are collected within the impact zone of the WTGs. The report shall include the species, number lost per site and an estimate of project wide insect mortality.
3. **Notification of Mortality for Sensitive Invertebrate Species.** The project owner or Designated Biologist shall notify the CPM and CDFW within 24-hours if any sensitive invertebrate species is detected during mortality searches. The report shall include the number and type of species subject to mortality or injury, photos and the location of the detection. Upon receiving notification, the CPM, in coordination with CDFW, will provide guidance for further action as appropriate to prevent significant impact to the species.

Verification: The project owner shall submit the draft IMMP to the CPM for review and approval and to the CDFW and USFWS for review and comment at least 45 days prior to start of operation. The project owner shall provide the final IMMP to the CPM, CDFW, and USFWS at least 7 days prior to start of operation. No operation of the WTGs may occur prior to approval of the final IMMP by the CPM.

AVOIDANCE OF MILKWEED PLANTS

BIO-15 The Project owner shall ensure protection all species of milkweed plants located in vegetation management zones and other disturbance areas to the maximum extent feasible. In addition, during vegetation management activities prior to any herbicide use, Designated Biologist and/or Biological Monitor(s)shall survey the work area for milkweed plants. The Designated Biologist and/or Biological Monitor(s) shall clearly delineate all milkweed plants with flagging, taping, or other conspicuous material for avoidance and herbicide use will be prohibited within 25 feet of any delineated milkweed plant except for direct application to targeted vegetation. The project owner shall submit a map of

milkweed species that were avoided during ground disturbance activities, vegetation management, or other disturbance to the CPM for review and approval and to the CDFW and USFWS for review and comment.

Verification: The project owner shall submit the required information to the CPM for review and approval and to the CDFW and USFWS for review and comment at least 30 days prior to ground disturbance. The project owner shall submit information describing the avoidance of milkweed plants and implementation of any avoidance measures in the Monthly Compliance Report (MCR) (**BIO-6**) to the CPM and CDFW.

SMALL INVERTEBRATE AVOIDANCE MEASURES

BIO-16 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for special-status invertebrates. All surveys shall be conducted by qualified biologists in accordance with the appropriate protocols, where available. Surveys shall be conducted during the appropriate season in all suitable habitat located within the project disturbance areas and access roads and within 100 feet of disturbance areas. Surveys shall be conducted by qualified biologists approved by the CPM, pursuant to **BIO-1** and **BIO-3**.

1. **Special Status Gastropods.** Prior to ground-disturbing or vegetation removal activities, areas ranging from medium to high-quality habitat will be clearly delineated in the field with staking, flagging, or other conspicuous material, and identified on project maps. Prior to disturbance in native vegetation the Designated Biologist and/or Biological Monitor(s) shall conduct preconstruction surveys for special-status invertebrates in the project area. Surveys shall be performed at least three days apart within a maximum 15-day period prior to the start of project activities. The final survey shall be completed within 72 hours of the start of work (excluding holidays and weekends). Surveys shall focus on micro habitat areas, rock piles, dense leaf litter, downed logs, and other features used by special status invertebrates. If special-status terrestrial or aquatic invertebrates are observed in work areas during construction, the Designated Biologist and/or Biological Monitor(s) will have the authority to temporarily stop work activities until the animal has left the area on its own volition or can be safely relocated by the Designated Biologist and/or Biological Monitor(s). If relocation of a special-status invertebrate is required, the animal will be moved to a predetermined area that supports suitable habitat.

2. **Aquatic invertebrates.** Prior to any disturbance in aquatic areas the Designated Biologist and/or Biological Monitor(s) shall conduct clearance surveys for special status aquatic invertebrates. Surveys shall be performed at within 72 hours prior to the start of project activities. If special-status aquatic invertebrates are observed in work areas during construction, the Designated Biologist and/or Biological Monitor(s) shall

have the authority to temporarily stop work activities until the animal can be safely relocated by the Designated Biologist and/or Biological Monitor(s)). If relocation of a special status inverte¬brate is required, the animal will be moved to a predetermined area in the same drainage that supports suitable habitat

Verification: The project owner shall submit a report summarizing the results of the surveys to the CPM and the CDFW no more than 30 days after initiating work. A report documenting any relocations will be submitted during monthly monitoring and annual reports as part of the Monthly Compliance Report and Annual Compliance Report. The Monthly and Annual Compliance Reports to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 30 days after each reporting period.

SENSITIVE FISH AVOIDANCE MEASURES

BIO-17 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for special-status fish. Fish shall be excluded from any work areas conducted within ponded or flowing water. Surveys shall be conducted by qualified biologists approved by the CPM and with the concurrence of the CDFW, pursuant to **BIO-1** and **BIO-3**. The project owner shall submit a proposed annual survey plan to the CPM for review and approval and to the CDFW and USFWS for review and comment.

1. **Surveys.** Prior to ground-disturbing, vegetation removal, or any activities conducted within any waterbody (e.g., lake, pond, river, stream, wet meadow, seep, spring), that has the potential to support sensitive species of fish, the Designated Biologist and/or Biological Monitor(s) shall conduct surveys to detect sensitive fish. In addition, a survey shall be conducted immediately prior to commencing activities to ensure sensitive fish are not present within the work area. The survey area will include any work sites and a 50- foot buffer up and downstream of the crossing, unless otherwise authorized by the CPM and CDFW. All sensitive fish observations will be recorded using a precision GPS unit. If it is determined that sensitive fish are present, the Designated Biologist and/or Biological Monitor(s) shall remain onsite throughout the duration of activities to ensure that impacts to the species are avoided. Any sensitive fish that are present will be allowed to leave the area on their own volition. If it is not possible to allow the fish to leave the work area on its own, the Designated Biologist and/or Biological Monitor(s) shall relocate it to the nearest suitable habitat out of harm's way.

2. **Notification of Any Sensitive Fish.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 24-hours if any sensitive fish species is detected during the surveys or during routine monitoring. The report shall include the number and type of species

detected, photos, and the location of the detection. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.

Consistent with proposed Lake and Streambed Conditions identified in BIO-31 the following conditions related shall be implemented.

3. **Work Restrictions.** No work shall occur in ponded or flowing water. All flow shall be diverted around the work site to ensure vehicles and equipment work in dry conditions.
4. **Water Diversion.** Prior to site mobilization the project owner shall prepare a Water Diversion Plan to be approved by the CPM in coordination with the CDFW. The Plan will ensure the following:
    a. **Fish Passage.** Fish passage facilities shall be incorporated into any temporary barrier that obstructs fish passage.
    b. **Flow Velocities.** All diversion channels shall be designed to maintain velocities at levels acceptable to fish species.
    c. **Seining Restrictions.** To clear the work area seining may be required. Seine mesh shall be properly sized to ensure fish are not gilled during capture. Seining shall include a minimum of three passes to ensure a maximum fish capture probability within the project activity area that will be dewatered.
    d. **Electrofishing Restrictions.** No electrofishing shall occur as a method of relocation unless authorized in writing by the CPM and the CDFW.
    e. **Maintain Aquatic Life.** When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, always allow sufficient water to pass downstream to maintain aquatic life below the obstruction pursuant to Fish and Game Code §5937.
    f. **Stranded Aquatic Life.** Check daily for stranded aquatic life as the water level in the dewatering area drops. All reasonable efforts shall be made to capture and move all stranded aquatic life observed in the dewatered areas. Capture methods may include fish landing nets, dip nets, buckets and by hand. Captured aquatic life shall be released immediately in the closest body of water adjacent to the work site. This condition does not allow for the take or disturbance of any State or federally listed species.
    g. **Release Locations Criteria.** Prior to capturing fish, the most appropriate release location(s) shall be determined, using the following criteria: water temperature shall be similar as the capture location; there shall be ample habitat for the captured amphibian; relocation areas shall be in proximity to the capture site, contain

suitable habitat, not be affected by project activities, and be free of exotic predatory species (i.e., bullfrogs, signal crayfish) to the best of the Designated Biologist's knowledge.

h. **Field Conduct including Wet Hands and Nets.** Handling of fish within the project site shall be minimized. However, when handling is necessary, the Designated Biologist and/or Biological Monitor(s) shall always wet hands (i.e., free of lotions, creams, sunscreen, oils, ointment, insect repellent or any other harmful materials) or nets prior to touching fish.

i. **Proper Holding Technique.** Holding containers shall be sized such that adult animals will fit without touching the sides. The Designated Biologist and/or Biological Monitor(s) shall temporarily hold fish in cool, shaded, aerated water in a flow-through live car. The Designated Biologist and/or Biological Monitor(s) shall protect fish from jostling and noise and shall not remove the species from this container until time of release.

5. **Water Temperatures and Water Changes.** The Designated Biologist and/or Biological Monitor(s) shall measure air and water temperatures periodically. A thermometer shall be placed in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature consistent with pre-project habitat conditions.

6. **Relocate Fish During Cool Temperatures.** The Designated Biologist and/or Biological Monitor(s) shall relocate the fish as soon as possible to a designated receiver location. If not possible the Designated Biologist and/or Biological Monitor(s) shall conduct relocation activities in the morning when the temperatures are cooler. Overcrowding in containers shall be avoided by having multiple containers for fish from larger age-classes to avoid predation. Larger fish shall be placed in the container or placed in a separate container with similar sized individuals.

7. **Timing of Initial Relocation.** The Designated Biologist and/or Biological Monitor(s) shall perform initial relocation immediately upon completing the stream diversion or after setting up block nets to isolate the work area.

8. **Mortality or Serious Injury of Fish.** If mortality or serious injury (i.e., compromising survival in the wild) during relocation exceeds more than a total of three sensitive fish, capturing efforts shall be stopped and the Designated Biologist shall immediately contact the CPM and CDFW to evaluate if additional measures are required.

9. **Report Mortalities and Serious Injuries Immediately.** If any native aquatic species are found dead or injured during relocation activities or other construction-related actions, the project owner or Designated Biologist shall notify the CPM and CDFW within 24 hours and

shall provide written notification to CPM and CDFW within 48 hours. The CPM and CDFW shall review the activities resulting in mortality and determine if additional protective measures are required.

10. **Barrier and or Exclusion Fencing.** Depending on the location the placement of a barrier net will be used to exclude special status fish from entering the work area. Barrier fencing shall be removed immediately after completion of work and the establish of normal flows (if a diversion was used).

11. **Reporting**. A report documenting survey results, including surveyor name(s), date(s) of survey, location (with maps), weather conditions, and any observations or detections of sensitive fish will be prepared and submitted to the CPM and CDFW within seven days of completing the surveys. In addition, a monitoring report that includes the location, description, and duration of the activities, any observations or detections of sensitive amphibians found during the surveys or project activities, and any relocation efforts will be provided during monthly, quarterly, and annual compliance reporting.

Verification: The project owner shall submit the proposed annual survey plan 45 days prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment. The project owner shall submit the results of the surveys no more than 30 days after the completion of the surveys. Monthly and Annual Compliance Reports shall be submitted to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 30 days after each reporting period.

SENSITIVE AMPHIBIAN AVOIDANCE MEASURES

BIO-18 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for special-status amphibians. These include Cascades frog, foothill yellow-legged frog, Pacific tailed frog, and Southern long-toed salamander. All surveys shall be conducted by qualified biologists in accordance with the appropriate protocols, where available. Surveys shall be conducted during the appropriate season in all suitable habitat located within the project disturbance areas and access roads and within 500 feet of disturbance areas. Surveys shall be conducted by qualified biologists approved by the CPM and with the concurrence of the CDFW, pursuant to **BIO-1** and **BIO-3**.

1. **Surveys.** Prior to ground-disturbing or vegetation removal activities within 500 feet of any waterbody (e.g., lake, pond, river, stream, wet meadow, seep, spring), that has the potential to support Cascades frog, foothill yellow-legged frog, Pacific tailed frog, and Southern long-toed salamander, the Designated Biologist and/or Biological Monitor(s) shall conduct protocol surveys to detect sensitive amphibians. In addition, a survey shall be conducted no more than 72 hours prior to commencing activities to search for the presence of sensitive amphibians. The survey

area shall include any work sites and a 500- foot buffer, unless otherwise authorized by the CPM and CDFW due to access constraints. The project owner shall submit a proposed annual survey plan prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment.

All sensitive amphibian observations will be recorded using a precision GPS unit. If it is determined that sensitive amphibian individuals are present, the Designated Biologist and/or Biological Monitor(s) shall remain onsite throughout the duration of activities to ensure that impacts to the species are avoided. Any sensitive amphibians that are present shall be allowed to leave the area on their own volition. If it is not possible to allow the animal to leave the work area on its own, the Designated Biologist and/or Biological Monitor(s) shall relocate it to the nearest suitable habitat out of harm's way.

2. **Notification of Any Sensitive Amphibian.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 24-hours if any sensitive amphibian species are detected during the surveys or during routine monitoring. The report shall include the number and type of species detected, photos, and the location of the detection. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.

3. **Release Locations Criteria.** Prior to capturing amphibians, the most appropriate release location(s) shall be determined, using the following criteria: water temperature shall be similar as the capture location; there shall be ample habitat for the captured amphibian; relocation areas shall be in proximity to the capture site, contain suitable habitat, not be affected by project activities, and be free of exotic predatory species (i.e., bullfrogs, signal crayfish) to the best of the Designated Biologist's knowledge. In the rare case that amphibian egg masses are found after July 1, the Designated Biologist shall make every attempt to wait until the egg masses hatch to transport them.

4. **Field Conduct including Wet Hands and Nets.** Handling of amphibians within the project site shall be minimized. However, when handling is necessary, the Designated Biologist and/or Biological Monitor(s) shall always wet hands (i.e., free of lotions, creams, sunscreen, oils, ointment, insect repellent or any other harmful materials) or nets prior to touching amphibians. The Fieldwork Code of Practice developed by the Declining Amphibian Populations Task Force (1991) will be followed to ensure that diseases are not conveyed between work sites by the biologist(s) when relocating any amphibian species.

5. **Proper Holding Technique.** Holding containers shall be sized such that adult animals will fit without touching the sides. The Designated

Biologist shall temporarily hold amphibians in cool, shaded, aerated water in a flow-through live car. The Designated Biologist shall protect amphibians from jostling and noise and shall not remove the species from this container until time of release.

6. **Water Temperatures and Water Changes.** The Designated Biologist shall measure air and water temperatures periodically. A thermometer shall be placed in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature consistent with pre-project habitat conditions.

7. **Relocate Amphibians during Cool Temperatures.** The Designated Biologist shall relocate the animal as soon as possible to a designated receiver location. If not possible the project owner shall conduct relocation activities in the morning when the temperatures are cooler. Overcrowding in containers shall be avoided by having multiple containers for amphibians from larger age-classes to avoid predation. Larger amphibians shall be placed in the container or placed in a separate container with similar sized individuals.

8. **Timing of Initial Relocation.** If feasible, the Designated Biologist shall perform initial relocation efforts several days prior to the start of ground disturbance. This provides an opportunity to return to the work area and perform additional relocation efforts immediately prior to ground disturbance.

9. **Mortality or Serious Injury of Amphibians.** If mortality or serious injury (i.e., compromising survival in the wild) during relocation exceeds more than a total of three amphibians, capturing efforts shall be stopped and the project owner or Designated Biologist shall immediately contact the CPM and CDFW to evaluate if additional measures are required.

10. **Report Mortalities and Serious Injuries Immediately.** If any native aquatic species are found dead or injured during relocation activities or other construction-related actions, the project owner or Designated Biologist shall notify the CPM and CDFW within 24 hours and shall provide written notification to CPM and CDFW within 48 hours. The CPM and CDFW shall review the activities resulting in mortality and determine if additional protective measures are required.

11. **Barrier and or Exclusion Fencing.** Depending on the location the placement of a barrier fencing will be used to exclude special status amphibians from entering the work area. Barrier fencing shall be removed within 72 hours of completion of work.

12. **Reporting.** A report documenting survey results, including surveyor name(s), date(s) of survey, location (with maps), weather conditions, and any observations or detections of sensitive amphibians will be prepared and submitted to the CPM and CDFW within seven days of

completing the surveys. In addition, a monitoring report that includes the location, description, and duration of the activities, any observations or detections of sensitive amphibians found during the surveys or project activities, and any relocation efforts will be provided during monthly, quarterly, and annual compliance reporting.

Verification: The project owner shall submit the draft annual survey plan 45 days prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment. The project owner shall submit the final annual survey plan approved by the CPM prior to commencing the surveys. The project owner shall submit the results of each annual survey to the CPM for review and approval and to the CDFW and USFWS for review and comment no more than 45 days after the completion of the surveys.

WESTERN POND TURTLE AVOIDANCE MEASURES

BIO-19 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for western pond turtle. Surveys shall be conducted by qualified biologists approved by the CPM and with the concurrence of the CDFW, pursuant to **BIO-1** and **BIO-3**.

1. **Surveys.** Prior to ground-disturbing or vegetation removal activities within 500 feet of any waterbody (e.g., lake, pond, river, stream, wet meadow, seep, spring), that has the potential to support western pond turtle upland habitat, Designated Biologist and/or Biological Monitor(s) shall conduct protocol surveys to detect this species. One week prior to any ground disturbance and within 24 hours of beginning work in suitable aquatic habitat, the Designated Biologist and/or Biological Monitor(s) shall conduct surveys for western pond turtle. The surveys shall be timed to coincide with the time of day and year when turtles are most likely to be active (during the cooler part of the day between 8 a.m. and 12p.m. during spring and summer). Prior to conducting the surveys, the biologist shall locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to quietly observe turtles. Each survey should include a 30-minute wait time after arriving onsite to allow startled turtles to return to open basking areas. The survey shall consist of a minimum 15-minute observation period for each area where turtles could be present. A map of proposed survey areas shall be provided to the CPM for approval and the CDFW and USFWS for concurrence prior to initiating the surveys.

2. **If Pond Turtles are Detected.** If adult or juvenile western pond turtles are present, Designated Biologist and/or Biological Monitor(s) shall remain onsite throughout the duration of activities to ensure that impacts are avoided. Any western pond turtle adults or juveniles that are present will be allowed to leave the area on their own volition. If it is not possible to allow the animal to leave the work area on its own, the

Designated Biologist and/or Biological Monitor(s) shall relocate it to the nearest suitable habitat out of harm's way. If western pond turtle is formally listed as federally threatened or endangered, any take or handling would only be authorized under the context of the appropriate permits from USFWS.

If the Designated Biologist and/or Biological Monitor(s) determines that active nesting sites could be adversely affected, all ground-disturbance and/or mechanical vegetation removal activities within 100 feet of the nesting site(s) will be prohibited until the nest site is deemed inactive. If avoidance of the nesting site is determined to be infeasible, the project owner shall coordinate with CPM, USFWS, CDFW to identify if it is possible to safely relocate the nest.

3. **Notification of Western Pond Turtle.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 24-hours if a western pond turtle is detected during the surveys or during routine monitoring. The report shall include the number of turtles detected, photos, and the location of the detection. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.

4. **Release Locations Criteria.** Prior to capturing or relocating western pond turtles, the most appropriate release location(s) shall be determined, using the following criteria: water temperature shall be similar as the capture location; there shall be ample habitat for the captured amphibian including suitable depths for refugia; relocation areas shall be in proximity to the capture site, contain suitable habitat including basking sites, not be affected by project activities, and be free of exotic predatory species (i.e., bullfrogs, signal crayfish) to the best of the designated biologist's knowledge. Pond turtle eggs shall not be relocated without prior approval of the CPM in coordination with the CDFW and USFWS.

5. **Mortality or Serious Injury of Western Pond Turtles.** If mortality or serious injury (i.e., compromising survival in the wild) during relocation exceeds more than a one western pond turtle, capturing efforts shall be stopped and the project owner shall immediately contact the CPM, CDFW, and USFWS to evaluate if additional measures are required.

6. **Report Mortalities and Serious Injuries Immediately.** If any native aquatic species are found dead or injured during relocation activities or other construction-related actions, the project owner or Designated Biologist shall notify the CPM and CDFW within 24 hours and shall provide written notification to CPM and CDFW within 48 hours. The CPM and CDFW shall review the activities resulting in mortality and determine if additional protective measures are required.

7. **Barrier and or Exclusion Fencing.** Depending on the location the placement of a barrier fencing will be used to exclude western pond turtles from entering the work area. Barrier fencing shall be removed within 72 hours of completion of work.

8. **Reporting.** A report documenting survey results, including surveyor name(s), date(s) of survey, location (with maps), weather conditions, and any observations or detections of sensitive amphibians will be prepared and submitted to the CPM, CDFW, and USFWS within seven days of completing the surveys. In addition, a monitoring report that includes the location, description, and duration of the activities, any observations or detections of pond turtles found during the surveys or project activities, and any relocation efforts will be provided during monthly, quarterly, and annual compliance reporting.

Verification: The project owner shall submit the proposed annual survey plan 45 days prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment. The project owner shall submit the pre-construction survey reports to the CPM, CDFW, and USFWS no more than 45 days after each survey effort has been completed.

SPECIAL STATUS MAMMAL AVOIDANCE MEASURES

BIO-20 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for American badger, California wolverine, fisher, and ringtail. Surveys shall be conducted by qualified biologists approved by the CPM and with the concurrence of the CDFW, pursuant to **BIO-1** and/or **BIO-3**.

1. **Surveys.** Prior to any ground-disturbing or vegetation removal activities that will occur in suitable habitat during the natal season for American badger (March 1 through May 15), California wolverine (January 1 through July 1), fisher (February 1 through June 1), and ringtail (May 1 through July 15), the Designated Biologist and/or Biological Monitor(s) shall conduct focused surveys for potential natal dens. Each of the proposed natal dates may change based on weather conditions.

   Surveys shall encompass work areas and a 250-foot buffer, unless otherwise prohibited due to legal access or safety issues. Any observations of California wolverine, fisher, or ringtail individuals, sign (e.g., tracks, scat, fur patches), or active natal dens will be recorded using a precision GPS unit and included on maps. In addition, a survey shall be conducted no more than 72 hours prior to commencing activities and a clearance survey conducted the morning of proposed work to search for the presence of active den sites in or near proposed work areas.

2. **If Natal Dens are Detected.** If an active natal den is identified, a 250-foot avoidance buffer will be established by the qualified biologist using

staking, flagging, or other conspicuous materials and no project activities will be permitted. The buffer may be adjusted in by the qualified biologist(s) in coordination with the CPM and with the concurrence of the CDFW based on location, specific site conditions, and proposed work activities. The avoidance buffer will only be removed once the qualified biologist(s) confirms that the young have left the den or the den has been naturally abandoned or failed. Any take of ringtail, fisher, or California wolverine active den sites is not authorized. If present American badgers can be passively relocated after the denning season has been completed.

3. **Notification of Detection.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 24-hours if an American badger, California wolverine, fisher, ringtail, or any other special status mammal is detected during the surveys or during routine monitoring. The report shall include the number of animals detected, photos, and the location of the detection. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.

4. **Monitoring.** The Designated Biologist and/or Biological Monitor(s) shall remain onsite throughout the duration of any project activities that are conducted within 300 feet of the edge of the avoidance buffer to ensure that impacts are avoided. The biologist will have the authority to halt work, if it is determined that the animals are exhibiting increased levels of distress (e.g., displaying defensive behavior, pacing, leaving the den).

5. **Mortality or Serious Injury of Small mammals.** If mortality or serious injury (i.e., compromising survival in the wild) occurs to any special status mammal the project owner shall immediately contact the CPM, CDFW, and USFWS to evaluate if additional measures are required.

6. **Report Mortalities and Serious Injuries Immediately.** If any special status mammal species are found dead or injured during relocation activities or other construction-related actions, the project owner or Designated Biologist shall notify the CPM and CDFW within 24 hours and shall provide written notification to CPM and CDFW within 48 hours. The CPM and CDFW shall review the activities resulting in mortality and determine if additional protective measures are required.

7. **Reporting.** A report documenting survey results, including surveyor name(s), date(s) of survey, location (with maps), weather conditions, and any observations or detections of sensitive mammals or their dens will be prepared and submitted to the CPM, CDFW, and USFWS within seven days of completing the surveys. In addition, a monitoring report that includes the location, description, and duration of the activities, any observations or detections of these species found during the surveys or project activities will be provided during monthly, quarterly, and annual compliance reporting.

Verification: The project owner shall submit the pre-construction survey reports to the CPM, CDFW, and USFWS no more than 45 days after each survey effort has been completed.

GRAY WOLF AVOIDANCE MEASURES

BIO-21 The Designated Biologist and/or Biological Monitor(s) shall conduct pre-construction surveys for gray wolves and coordinate with the CDFW to determine if active packs are in the region. Surveys shall be conducted by qualified biologists approved by the CPM and with the concurrence of the CDFW, pursuant to **BIO-1** and/or **BIO-3**.

1. **Surveys.** Prior to any site mobilization, ground-disturbing or vegetation removal activities a qualified biologist(s) approved pursuant to **BIO-1** and/or **BIO-3** will conduct focused surveys for potential gray wolves. Surveys shall encompass the project area and a 500-foot unless otherwise prohibited due to legal access or safety issues. The surveys shall include a combination of track counts, camera trapping, and passive observation from a blind or concealed area. Track counts can be conducted during winter when it is easy to pick out lines of tracks but shall also be conducted at least two weeks prior to site mobilization. Designated Biologist shall include a minimum of four days of surveys in the winter and four days in immediately prior to site mobilization. The project owner shall submit the proposed annual survey plan prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment.

   Any observations of gray wolves or their sign (e.g., tracks, scat, fur patches, camera detections), or active natal dens will be recorded using a precision GPS unit and included on maps. In addition, a survey shall be conducted no more than 72 hours prior to commencing activities and a clearance survey conducted the morning of proposed work to search for the presence of wolves in or near proposed work areas.

2. **Coordination with the CPM and CDFW.** Prior to site mobilization the Designated Biologist shall coordinate with the CPM and CDFW to determine if there is the potential for gray wolf activity in the project area. Coordination with the CPM and CDFW shall continue throughout the duration of construction activities to determine potential areas of gray wolf activity and to establish any additional best management practices, which may include avoidance buffers and prohibiting activities in areas actively being used by wolves.

3. **If a Natal Den or Rendezvous Area is Detected.** If an active natal den or rendezvous area is identified, a 500-foot avoidance buffer will be established by the qualified biologist using staking, flagging, or other conspicuous materials and no project activities will be permitted. The buffer may be adjusted by the qualified biologist(s) in coordination with

the CPM and with the concurrence of the CDFW based on location, specific site conditions, and proposed work activities. The avoidance buffer will only be removed once the qualified biologist(s) confirms that the young have left the den or the den has been naturally abandoned or failed.

4. **Notification of Detection.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 24-hours if gray wolves or their sign are detected during the surveys or during routine monitoring. The report shall include the number of animals detected, photos, any evidence of radio collars or tags, and the location of the detection. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.
5. **Monitoring.** The qualified biologist(s) will remain onsite throughout the duration of any project activities that are conducted within 500 feet of the edge of the avoidance buffer to ensure that impacts are avoided. The biologist will have the authority to halt work, if it is determined that the animals are exhibiting increased levels of distress (e.g., displaying defensive behavior, pacing, leaving the den).
6. **Report Mortalities and Serious Injuries Immediately.** If any gray wolves are found dead or injured the project owner or Designated Biologist shall notify the CPM and CDFW within 24 hours and shall provide written notification to CPM and CDFW within 48 hours. The CPM and CDFW shall review the activities resulting in mortality and determine if additional protective measures are required.
7. **Reporting.** A report documenting survey results, including surveyor name(s), date(s) of survey, location (with maps), weather conditions, and any observations or detections of gray wolves or their dens/rendezvous sites will be prepared and submitted to the CPM, CDFW, and USFWS within seven days of completing the surveys. In addition, a monitoring report that includes the location, description, and duration of the activities, any observations or detections of these species found during the surveys or project activities will be provided during monthly, quarterly, and annual compliance reporting.

Verification: The Project owner shall submit the proposed annual survey plan 45 days prior to commencing the surveys to the CPM for review and approval and to the CDFW and USFWS for review and comment. The Project owner shall submit the pre-construction survey reports to the CPM, CDFW, and USFWS no more than 45 days after each survey effort has been completed.

SPECIAL-STATUS BAT AVOIDANCE MEASURES

BIO-22 The Designated Biologist and/ Biological Monitor(s)shall conduct pre-construction surveys for bats. Surveys shall be conducted by qualified biologists

approved by the CPM and with the concurrence of the CDFW, pursuant to **BIO-1** and **BIO-3**. The resumes of the proposed bat biologists shall be provided to the CPM for review and approval and the CDFW for review and concurrence prior to the initiation of pre-construction surveys.

1. **Preconstruction Bat Roost Surveys.** Prior to mobilization and any vegetation clearing or ground disturbance a qualified bat biologist will conduct a roost habitat assessment to identify potential colonial roost sites of special-status and common bat species within 500-feet of the construction area. Surveys also be conducted during the maternity season (1 March to 31 July) within 500-feet of project activities, where legal access is granted. Surveys shall be repeated at different times of year, if deemed necessary by the bat biologist to determine the presence of seasonally active roosts (hibernacula, migratory stopovers, maternity roosts). In addition, surveys shall be conducted no more than Surveys shall be conducted no more than 7 days prior to vegetation removal, grading, or tree removal to verify bats do not occur in the project area.

    a. Appropriate field methods will be employed to determine the species, type and vulnerability of the roost to construction disturbance. Methods will follow best practices for roost surveys such that species are not disturbed, and adequate temporal and spatial coverage is provided to increase likelihood of detection. Roost surveys shall consist of both daylight surveys for signs of bat use and evening/night emergence surveys or evaluate the status of night roosts. Survey timing shall be adequate to account for individual bats or species that might not emerge until well after dark.

    b. Methods and approaches for determining roost occupancy status shall include a combination of the following components as the biologist deems necessary for the specific roost site.

        i. Passive and/or active acoustic monitoring such as Anabat or other device approved by the CPM in coordination with the CDFW.

        ii. Guano traps to determine activity status.

        iv. Night-vision equipment.

        v. Passive infrared camera traps.

    c. At the completion of the roost surveys, a report shall be prepared documenting survey areas surveys, methods, results, and mapping of high-quality habitat or confirmed roost locations.

2. **Active Maternity or Hibernacula.** If active maternity roosts or hibernacula are found, the structure, tree or feature occupied by the roost shall be avoided (i.e., not removed) until the young have matured or the hibernacula period is over. When an active maternity roost or

hibernacula is present within 500 feet of a construction site a qualified biologist shall conduct an initial assessment of the roost's response to construction activities and recommend buffer expansion if there are signs of disturbance from the roost. This buffer may be adjusted based on site conditions, topography, type of work activity, or other ecological evidence with the approval of the CPM in coordination with the CDFW.

3. **Avoid Removing or Disturbing Bat Roosts.** Active bat roosts shall not be disturbed and will be provided a minimum buffer of 300 feet where preexisting disturbance is moderate or 500 feet where preexisting disturbance is minimal. Confirmation of buffer distances and determination of the need for a biological monitor for active maternity roosts or hibernacula will be obtained in consultation with the CPM in coordination with the and CDFW. If suitable roost sites are to be removed or otherwise affected by the project, the bat biologist will conduct targeted roost surveys of all identified sites that would be affected. Because bat activity is highly variable (both spatially and temporally) across the landscape and may move unpredictably among several roosts, several separate survey visits shall be required.
4. **Roost Site Removal.** A qualified bat biologist shall survey potential roost sites prior to their disturbance or removal. Any structures (natural or artificial) that show evidence of significant bat use within the past year should be retained whenever feasible. If such a structure must be removed or disturbed, the project owner shall create alternative roost sites in coordination with the CPM and the CDFW. If removal or disturbance of trees or other potential roost sites cannot be avoided, removal shall be conducted outside the maternity season to avoid mortality of maternity colonies.
5. **Bats - Tree Removal.** Under the monitoring and guidance of the qualified bat biologist, removal of potential roost trees will be implemented to passively vacate bats from roosts.
6. **Limbing.** Trim off all limbs without roost features (cavities, crevices, or exfoliating bark) to create noise and vibration disturbance on the tree (e.g., chainsaw cutting or chippers) and to alter the air flow and temperature around the roost feature thus encouraging bats to vacate roost features on their own. The tree shall then be left for approximately 24 hours to allow for the bats to move to another roost site. On the day following trimming and removal of non-habitat roost features, the tree is removed. If bats are in the branches, they will be removed from the tree and set aside, cut the branches off intact and set them upright against trees away from the construction area to allow any bats present to passively escape. The bat biologist shall remain on site during this process to ensure bats are not harmed and to care for any bats should they become injured.

7. **Bat Protection - Culverts.** Prior to the removal of any bridge or culvert the site shall be surveyed for bats by a qualified biologist. If bats are found, the biologist will determine if it is a day or night roost, hibernacula, or maternity colony. Hibernacula or maternity colonies shall not be disturbed.
8. **Care of Injured Bats.** The designated biologist shall immediately transport bats to a CDFW-approved wildlife rehabilitation or veterinary facility if they are injured because of exclusion activities or structure demolition. The project owner shall identify an appropriate wildlife care facility before starting exclusion or demolition activities of any potential bat roosts. The location of the care facility shall be provided to the CPM and the CDFW prior to site mobilization. The project owner shall bear any costs associated with the care or treatment of project related injured bats. The project owner shall provide a letter report detailing the outcome of the care to the CPM and the CDFW.
9. **Capture of Injured Bats.** The designated biologist shall capture injured bats by hand-capture or other methods approved by the CPM in coordination with the CDFW. Mist nets or harp traps shall not be used as capture techniques.
10. **Handling.** Prior to handling injured bats, the designated biologist is strongly encouraged to have received appropriate pre-exposure rabies vaccinations and boosters, and/or have maintained a rabies antibody titer recommended by the U.S. Department of Health and Human Services CDC and the California Department of Public Health (https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Rabies.aspx).
11. **Care and Transport of Injured Bats.** The designated biologist shall place captured bats in individual holding bags. The designated biologist shall place the holding bags inside a large plastic cooler on a stable surface away from project construction to prevent tipping or other disturbance to the cooler. The cooler is intended to maintain a steady temperature for the bats, as well as to protect them from injury from debris, being stepped on, or any other external threat. The cooler shall have air holes or remain partially open to prevent suffocation of the bats inside the cooler.
12. **Notification of Detection.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 24-hours if any bats are injured or require medical treatment. The report shall include the number of animals injured, photos, and the location and nature of the injury. Upon receiving notification, the CPM and CDFW will provide guidance for further action as appropriate to the species.
13. **Reporting.** A report documenting survey results, including surveyor name(s), date(s) of survey, location (with maps), weather conditions,

and any observations or detections of bats, roost sites, hibernaculum, or maternity colonies will be prepared and submitted to the CPM, CDFW, and USFWS within 30 days of completing the surveys. In addition, a monitoring report that includes the location, description, and duration of the activities, any observations or detections of these species found during the surveys or project activities will be provided during monthly, quarterly, and annual compliance reporting.

Verification: The project owner shall submit the pre-construction survey reports to the CPM, CDFW, and USFWS no more than 30 days after each survey effort has been completed. The project owner shall inform the CPM and the CDFW if any maternity colonies or hibernacula are detected within 7 days. The project owner shall provide a letter report detailing the outcome of the care of any injured bats to the CPM and the CDFW within 14 days of the incident.

NESTING BIRD AVOIDANCE AND MINIMIZATION MEASURE

BIO-23 The project owner shall prepare and implement a Nesting Bird Management Plan (NBMP) in coordination with CPM, CDFW, and USFWS. The NBMP shall describe methods to minimize potential project effects to nesting birds and avoid any potential for unauthorized take. Where scheduling allows the project owner will clear or remove any vegetation, conduct site preparation in open or barren areas, or other project-related activities that may adversely affect breeding birds outside the nesting season.

Pre-construction nest surveys shall be during the breeding season for local birds and will be timed to account for seasonal variation and typical winter conditions that occur on the site (January through September or as defined by the approved biologist at this location). In addition, protocol burrowing surveys owl in accordance with the 2012 CDFG Staff Report on Burrowing Owl Mitigation (CDFG, 2012) or newer protocols if issued shall be conducted prior to any ground disturbing activity year-round to ensure migratory owls are not present after vegetation has been removed. project-related disturbance including construction and pre-construction activities shall not proceed within 150 feet of active nests of common bird species or 500 feet of active nests of raptors or special-status bird species (except for golden or bald eagle, and species addressed by separate COCs) until approval of the NBMP by the CPM in consultation with CDFW and USFWS. If burrowing owls are detected on site, the project owner shall notify the CPM, CDFW, and USFWS by email within 48 hours, and no ground-disturbing activities, such as vegetation clearance or grading, will be permitted within a buffer of no fewer than 330 feet (100 meters) from an occupied burrow during the breeding season (February 1–August 31). During the non-breeding (winter) season (September 1–January 31), ground-disturbing work may proceed near active burrows if the work occurs no closer than 165 feet (50 meters) from the burrow. Depending on the level of disturbance, a reduced buffer may be allowed pending approval of the CPM in coordination with the CDFW and USFWS. If

active burrows cannot be avoided, a Burrowing Owl Exclusion Plan will be prepared following established CDFW protocols. The plan shall describe all necessary measures to minimize impacts on burrowing owls during passive relocation, including details on how owls will be removed and excluded from burrows, the methodology to do so, where the owls will be moved to, and whether any follow-up monitoring will be required. Plan will be reviewed and approved by the CPM with the concurrence of the CDFW. Any passive relocation activities would require additional take coverage from the CDFW. Surveys for all species shall be conducted by qualified biologists approved by the CPM with the concurrence of the CDFW and USFWS.

1. **Survey Requirements.** Surveys shall cover all potential nesting, burrow, or surrogate burrow habitat and substrate within the project site and areas surrounding the project site within 500 feet of the project boundary.
2. **Survey Schedules.** At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. Pre-construction surveys shall be conducted no more than 14 days prior to initiation of construction activity. One survey needs to be conducted within the 3-day period preceding initiation of site mobilization, brush clearing, ground disturbance, or construction activity. Surveys will need to be repeated throughout construction to ensure that birds are not nesting on equipment or have moved into an area after the initial vegetation clearance has been completed.
3. **Nest and Avian Monitoring and Surveys During Construction.** Additional follow-up surveys shall be required if periods of construction inactivity exceed three weeks during January 1 through September 31 in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation.
4. **Nest Detection.** If active nests, burrows, or surrogate burrows are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest) shall be established around each nest. Fencing and/or flagging will be used to delineate the no-activity zone. To minimize the potential to affect the reproductive success of the nesting pair, the extent of the no-activity zone will be based on the distance of the activity to the nest, the types and extent of the proposed activity, the duration and timing of the activity, the sensitive and habituation of the species, and the dissimilarity of the proposed activity to background activities. The no-activities zone shall be large enough to avoid nest abandonment. Specific buffer distances will be described and approved by the CPM in consultation with the CDFW and USFWS in the NBMP; these buffers may be modified with the CPM's approval in consultation with the CDFW and USFWS. For special-status species, if an active nest is identified, the size of each buffer zone shall be determined by the

Designated Biologist in consultation with the CPM (in coordination with CDFW and USFWS or as described in COCs specific for those species). Nest locations shall be mapped using GPS technology.

5. **Active Nest Protection.** If active nests are detected during the survey, the Designated Biologist or Biological Monitor shall monitor all nests with buffers at least once per week, to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the Designated Biologist or Biological Monitor shall immediately implement adaptive measures to reduce disturbance in coordination with the CPM in consultation with the CDFW and USFWS. These measures could include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, or placement of visual screens or sound dampening structures between the nest and construction activity. The Designated Biologist or Biological Monitor shall monitor the nest until it is determined that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made. Any nest buffer reduction would require full time monitoring if reduced form the levels identified in the approved NBMP.

6. **NBMP Content.** The NBMP shall include: (1) definitions of default nest avoidance buffers for each species or group of species, depending on characteristics and conservation status for each species and the nature of planned project activities in the vicinity; (2) a notification procedure for buffer distance reductions should they become necessary; (4) a pre-construction survey protocol (surveys no longer than 3 days prior to starting work activity at any site); (5) a monitoring protocol, to be implemented until adjacent construction activities are completed or the nest is no longer active, including qualifications of monitors, monitoring schedule, and field methods, to ensure that any project-related effects to nesting birds will be minimized; and (6) a protocol for documenting and reporting any inadvertent contact with or effects to birds or nests. The NBMP will be applicable throughout the nesting season (beginning January 1 for raptors, February 1 for most other birds, and continuing through the end of August).

7. **Nest Deterrents.** The NBMP shall describe any proposed measures or deterrents to prevent or reduce bird nesting activity on project equipment or facilities, such as buoys, visual or auditory hazing devices, bird repellents, securing of materials, and netting of materials, vehicles, and equipment. It shall also include timing for installation of nest deterrents and field confirmation to prevent effects to any active nest; guidance for the contractor to install, maintain, and remove nest deterrents according to product specifications; and periodic monitoring

of nest deterrents to ensure proper installation and functioning and prevent injury or entrapment of birds or other animals. In the event that an active nest is located on project facilities, materials or equipment, SCE will avoid disturbance or use of the facilities, materials or equipment (e.g., by red-tag) until the nest is no longer active.

8. **Nest Start Removal.** Prior to removing any suitable nesting habitat, preconstruction nesting bird surveys should inform as to where existing raptor nests, and other special status bird nests, occur throughout the project area. The locations of existing special status bird nests within the habitat removal footprint shall be recorded and mapped by a qualified biologist. Such nests shall be removed outside of the nesting bird season. Due to the site fidelity common of raptors, raptor nest removal throughout the project area shall be quantified, mapped and mitigated post construction due to the permanent removal of suitable habitat. Due to the potential for nest building during active construction, a biological monitor shall be employed for the duration of project construction to regularly inspect for nest building attempts that may occur on/within construction equipment and/or within an area of active construction disturbance. In the event nest building is detected, the biologist shall deter birds from nesting using non-invasive methods to modify the circumstances. Methods may include, but are not limited to, removal of attempted nesting starts, visual deterrents, like reflective materials and/or physical barriers. In the event a nest is built, and eggs are laid, the nest shall be considered active nest and shall be avoided. This may include placing a buffer around a piece of equipment or closing off a work area until the nest has fledged. This measure shall not be employed for State of Federal Special Stats Species.

9. **Communication.** The NBMP shall specify the responsibilities of construction monitors with regard to nests and nest issues and specify a direct communication protocol to ensure that nest information and potential adverse impacts to nesting birds can be promptly communicated from nest monitors to construction monitors, so that any needed actions can be taken immediately.

10. **Accidental Nest Disturbance.** The NBMP shall specify a procedure to be implemented following accidental disturbance of nests, including wildlife rehabilitation options. It also shall describe any proposed measures, and applicable circumstances, to prevent take of precocial young of ground-nesting birds such as killdeer or quail. For example, chick fences may be used to prevent them from entering work areas and access roads. Finally, the NBMP will specify a procedure for removal of inactive nests, including verification that the nest is inactive and a notification/approval process. The project owner shall identify an appropriate wildlife care facility before starting site mobilization. The location of the care facility shall be provided to the CPM and the CDFW

prior to site mobilization. The project owner shall bear any costs associated with the care or treatment of project related injured bats. The project Owner shall provide a letter report detailing the outcome of the care to the CPM and the CDFW.

11. **Reporting.** Throughout the construction phase of the project, nest locations, project activities in the vicinity of nests (including helicopter traces), and any adjustments to buffer areas shall be updated and available to the CPM daily. All buffer reduction notifications and prompt notifications of nest-related non-compliance and corrective actions will be made via email to the CPM, CDFW and USFWS. The draft NBMP shall include a proposed format for daily and weekly reporting (e.g., spreadsheet available online, tracking each nest). In addition, the NBMP shall specify the format and content of nest data to be provided in regular monitoring and compliance reports. At the end of each year's nest season, the project owner shall submit an annual NBMP report to the CPM, CDFW, and USFWS. Specific contents and format of the annual report will be reviewed and approved by the CPM in consultation with CDFW and USFWS.

Verification: The project owner shall submit the resumes of avian monitors no less than 45 days prior to site mobilization if these activities occur during the breeding season. The project owner shall submit pre-construction survey reports to the CPM, CDFW, and USFWS no more than 30 days after each survey effort has been completed. The project owner shall provide a letter report detailing the outcome of the care of any injured birds or nest failures to the CPM and the CDFW within 14 days of the incident.

WILLOW FLYCATCHER AVOIDANCE AND MINIMIZATION MEASURES

BIO-24 The project owner shall conduct protocol surveys for willow flycatchers and avoid occupied habitat.

1. **Survey Requirements.** If project-related construction activities are scheduled to occur during the breeding season (May 1 through August 15), a qualified avian biologist shall conduct focused protocol surveys in suitable habitat within 500-feet of disturbance areas. The project owner shall provide a map of all suitable habitat for this species to the CPM for approval and the CDFW, and USFWS for concurrence prior to implementing the surveys. The maps shall be based on field inspections of riparian habitat that is present in and within 500-feet of all project disturbance areas and include photographs and GPS locations.
2. **Survey Schedules.** The surveys shall be done in accordance with A Willow Flycatcher Survey Protocol for California, or the most recent guidance on the species. One survey shall be conducted within the 3-day period preceding initiation of site mobilization, brush clearing, ground disturbance, or construction activity if those activities are proposed to

occur during the period when protocol surveys are being conducted. Should activities commence prior to the onset of the survey protocol, the surveys shall commence concurrently with project activities.

3. **Nest Detection.** If a territory or nest is confirmed during the surveys the project owner shall notify the CPM, CDFW and USFWS within 48 hours. In coordination with the Designated Biologist, CPM, CDFW and USFWS, a 500-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted as determined by a qualified avian biologist in coordination with the CPM, CDFW and USFWS. Nest locations shall be mapped using GPS technology and provided the CPM.

4. **Active Nest Protection.** If active nests are detected during the survey, the Designated Biologist or Biological Monitor shall monitor all nests with buffers at least once per week, to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the Designated Biologist or Biological Monitor shall immediately implement adaptive measures to reduce disturbance in coordination with the CPM in consultation with the CDFW and USFWS. These measures could include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, or placement of visual screens or sound dampening structures between the nest and construction activity. The Designated Biologist or Biological Monitor shall monitor the nest until it is determined that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made. Any nest buffer reduction would require full time monitoring if reduced form the levels identified in the approved NBMP.

5. **Accidental Nest Disturbance.** The project owner shall notify the CPM, CDFW, and USFWS within 48 hours if an active nest fails and if the failure was project related or predation.

6. **Reporting.** The project owner shall prepare a Willow Flycatcher Survey Report and submit the document to the CPM for review and approval and the CDFW and USFWS for comment. Throughout the construction phase of the project, nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be updated and available to the CPM daily. All buffer reduction notifications and prompt notifications of nest-related non-compliance and corrective actions will be made via email to the CPM, CDFW and USFWS. At the end of each year's nest season, the project owner shall submit an annual report to the CPM, CDFW, and USFWS. Specific contents and format of the annual

report will be reviewed and approved by the CPM in consultation with CDFW and USFWS.

Verification: The project owner shall submit the resumes of the proposed willow flycatcher biologists and avian monitors no less than 45 days prior to site mobilization if these activities occur during the breeding season. The project owner shall submit pre-construction survey reports to the CPM, CDFW, and USFWS no more than 30 days after each survey effort has been completed. The project owner shall provide a letter report detailing the outcome of the care of any injured birds or nest failures to the CPM and the CDFW within 14 days of the incident.

BALD AND GOLDEN EAGLE AVOIDANCE AND MINIMIZATION MEASURES

BIO-25 The project owner shall conduct protocol surveys for bald and golden eagles and avoid occupied nests in the project area and surrounding mountains. Survey schedule and requirements will be as identified below unless otherwise authorized by the CPM in consultation with the CDFW and USFWS.

1. **Survey Requirements.** The project owner shall present the resumes of proposed eagle surveyors to the CPM for approval and the CDFW and USFWS for concurrence prior to conducting surveys. Preconstruction eagle nesting surveys shall occur of known previously active nest sites and potentially suitable nesting sites to determine whether eagles are actively nesting and/or maintaining territories within 3 miles of the project site boundary. Surveys will be designed and carried out by a qualified biologist with experience in the natural history and nesting behavior of eagles, following USFWS guidelines. Surveys will include all suitable eagle nesting habitat within a 3-mile buffer surrounding the project construction boundary, as accessible, and subsequent observations at known nests to assess territory occupancy and nesting activity by adult eagles following appropriate protocols: CDFW's Bald Eagle Nesting Territory Survey Form and Instructions (2010) and USFWS Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010).
2. **Nesting Season Inventory Data.** At a minimum, data collected during the nesting season surveys shall include the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; age class of bald or golden eagles observed; nesting chronology; number of young at each visit; photographs; and substrate upon which nest is placed.
3. **Determination of Unoccupied Territory Status.** A nesting territory or inventoried habitat shall be considered unoccupied by bald or golden eagles only after completing at least two full surveys in a single breeding season.

4. **Nest Detection.** If a territory or nest is confirmed during the surveys the project owner shall notify the CPM, CDFW and USFWS within 48 hours. In coordination with the Designated Biologist, CPM, CDFW and USFWS, a one-mile line of sight disturbance-free buffer shall be established and demarcated by fencing or flagging and placed on project maps. This buffer may be adjusted as determined by a qualified avian biologist in coordination with the CPM, CDFW and USFWS. Nest locations shall be mapped using GPS technology and provided the CPM.

5. **Active Nest Protection.** If an occupied nest (as defined by Pagel et al., 2010) is detected within 2 miles of the project, the project owner shall implement a one-mile line-of-sight and one-half mile no line-of-sight buffer to ensure that project construction activities do not result in injury or disturbance to bald or golden eagles. Triggers for adaptive management shall include any evidence of project-related disturbance to nesting bald or golden eagles, including but not limited to agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. Adaptive management actions, include, but are not limited to, cessation of construction activities that are deemed by a qualified biologist to be the source of bald or golden eagle disturbance. The Designated Biologist or Biological Monitor shall monitor the nest until it is determined that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.

6. **Accidental Nest Disturbance.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 48 hours if an active nest fails and if the failure was project related or predation.

7. **Reporting.** The project owner shall prepare a Bald and Golden Eagle Survey Report and submit the document to the CPM for review and approval and the CDFW and USFWS for comment. Throughout the construction phase of the project, nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be updated and available to the CPM daily. Bald and golden eagle survey data and, if applicable, nest activity monitoring results and any adaptive management actions taken, will be provided to CPM, CDFW, and USFWS in monthly monitoring reports, as seasonal data becomes available and if specific nest monitoring or any adaptive management actions are taken, and summarized in annual project monitoring reports. All buffer reduction notifications and prompt notifications of nest-related non-compliance and corrective actions will be made via email to the CPM, CDFW and USFWS. At the end of each year's nest season, the project owner shall submit an annual report to the CPM, CDFW, and USFWS.

Specific contents and format of the annual report will be reviewed and approved by the CPM in consultation with CDFW and USFWS.

Verification: The project owner shall submit the resumes of the proposed bald and golden eagle biologists and avian monitors no less than 45 days prior to conducting the surveys and or site mobilization whichever comes first. The project owner shall submit pre-construction survey reports to the CPM, CDFW, and USFWS no more than 30 days after each survey effort has been completed. The project owner shall provide a letter report detailing the outcome of any nest failures to the CPM and the CDFW within 14 days of the incident.

CALIFORNIA SPOTTED OWL AVOIDANCE AND MINIMIZATION MEASURES

BIO-26 The Designated Biologist and/or Biological Monitor (s) shall conduct protocol surveys for California spotted owls and avoid occupied nests. Survey schedule and requirements will be as identified below unless otherwise authorized by the CPM in consultation with the CDFW and USFWS.

1. **Survey Requirements.** The project owner shall present the resumes of proposed California spotted owl surveyors to the CPM for approval and the CDFW and USFWS for concurrence prior to conducting surveys. Prior to conducting the surveys, the project owner shall provide a map to the CPM, CDFW, and USFWS identifying all potential nesting habitat in or within 0.25-miles of proposed disturbance areas. Preconstruction surveys for California spotted owl shall occur annually in all areas supporting suitable roosting or breeding habitat within 0.25 miles of project disturbance areas including but not limited to WTG locations, access roads, lay down areas, and vegetation management areas. Surveys will be designed and carried out by a qualified biologist with experience in the natural history and nesting behavior of California or northern spotted owls, following USFWS guidelines for Northern spotted owl or any new guidance issued for California spotted owls prior to or during construction. Project activities within 0.25 miles of potentially suitable spotted owl nesting habitat shall not occur between February 1 and July 31 unless a qualified biologist conducts spotted owl surveys following USFWS survey protocol for disturbance-only projects.

2. **Nesting Season Inventory Data.** At a minimum, data collected during the nesting season surveys shall include the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; number observed; nesting chronology; number of young at each visit; photographs; and characterization of the habitat in which the nest is placed.

3. **Nest Detection.** If a territory or nest is confirmed during the surveys the project owner shall notify the CPM, CDFW and USFWS within 48 hours. In coordination with the Designated Biologist, CPM, CDFW and USFWS, a 0.25-mile line of sight disturbance-free buffer shall be

established and demarcated by fencing or flagging and placed on project maps. This buffer may be adjusted as determined by a qualified avian biologist in coordination with the CPM, CDFW and USFWS. Nest locations shall be mapped using GPS technology and provided the CPM.

4. **Active Nest Protection.** If surveys detect nesting spotted owls, a 0.25 mile no-disturbance buffer zone shall be implemented around the nests until the end of the breeding season, or a qualified biologist determines that the nest is no longer active. Alternate buffer zones may be proposed after conducting an auditory and visual disturbance analysis following the USFWS guidance, Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California, dated October 1, 2020. Alternative buffers must be approved in writing by the CPM in consultation with the CDFW and USFWS. The Designated Biologist or Biological Monitor shall monitor the nest until it is determined that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.

5. **Accidental Nest Disturbance.** The project owner shall notify the CPM, CDFW, and USFWS within 48 hours if an active nest fails and if the failure was project related or predation.

6. **Reporting.** The project owner shall prepare a California Spotted Owl Survey Report and submit the document to the CPM for review and approval and the CDFW and USFWS for comment. Throughout the construction phase of the project, nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be updated and available to the CPM daily. Nest data and, if applicable, nest activity monitoring results and any adaptive management actions taken, will be provided to CPM, CDFW, and USFWS in monthly monitoring reports, as data becomes available and if specific nest monitoring or any adaptive management actions are taken, and summarized in annual project monitoring reports. All buffer reduction notifications and prompt notifications of nest-related non-compliance and corrective actions will be made via email to the CPM, CDFW and USFWS. At the end of each year's nest season, the project owner shall submit an annual report to the CPM, CDFW, and USFWS. Specific contents and format of the annual report will be reviewed and approved by the CPM in consultation with CDFW and USFWS.

Verification: The project owner shall submit the resumes of the proposed California spotted owl biologists and avian monitors no less than 45 days prior to conducting the surveys and or site mobilization whichever comes first. The project owner shall submit pre-construction survey reports to the CPM, CDFW,

and USFWS no more than 30 days after each survey effort has been completed. The project owner shall provide a letter report detailing the outcome of any nest failures to the CPM and the CDFW within 14 days of the incident.

NORTHERN GOSHAWK AVOIDANCE AND MINIMIZATION MEASURES

BIO-27 The Designated Biologist and/or Biological Monitor(s)shall conduct protocol surveys for Northern Goshawks and avoid occupied nests. Survey schedule and requirements will be as identified below unless otherwise authorized by the CPM in consultation with the CDFW and USFWS.

1. **Survey Requirements.** The Designated Biologist shall provide the resumes of proposed Northern Goshawks surveyors to the CPM for approval and the CDFW and USFWS for concurrence prior to conducting surveys, pursuant to **BIO-1** and/or **BIO-3**. Prior to conducting the surveys, the project owner or Designated Biologist shall provide a map to the CPM, CDFW, and USFWS identifying all potential nesting habitat in or within 0.25-miles of proposed disturbance areas. Preconstruction surveys for Northern Goshawks shall occur annually in all areas supporting suitable roosting or breeding habitat within 0.25 miles of project disturbance areas including but not limited to wind turbine generator (WTG) locations, access roads, lay down areas, and vegetation management areas. Surveys will be designed and carried out by a qualified biologist with experience in the natural history and nesting behavior of Northern Goshawks, following the US Forest Service 2006 Northern Goshawk Inventory and Monitoring Technical Guide, or other CPM, CDFW, and USFWS approved survey protocol, prior to or during construction. Project activities within 0.25 miles of potentially suitable Northern Goshawk nesting habitat shall not occur between February 1 and July 31 unless a qualified biologist conducts Northern Goshawk surveys following the approved survey protocol. Dawn Acoustical Surveys provide a very high probability of detecting goshawks regardless of breeding status. Detections with this method are usually obtained in March and April, and a brief search of the detection area during the late incubation or (preferably) nestling stage is required to determine the location of an active nest. If evidence of Northern Goshawk breeding or courtship behavior is observed conduct Intensive Search Surveys should be used during the nestling and/or fledgling stages. The project owner shall provide a location of proposed calling stations or provide rationale for conducting a different type of survey protocol.

2. **Nesting Season Inventory Data.** At a minimum, data collected during the nesting season surveys shall include the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; number observed; nesting chronology; number of young at each visit; photographs; and characterization of the habitat in which the nest is placed.

3. **Nest Detection.** If a territory or nest is confirmed during the surveys the project owner shall notify the CPM, CDFW and USFWS within 48 hours. In coordination with the Designated Biologist, CPM, CDFW and USFWS, a 0.25-mile line of sight disturbance-free buffer shall be established and demarcated by fencing or flagging and placed on project maps. This buffer may be adjusted as determined by a qualified avian biologist, approved pursuant to **BIO-1** and/or **BIO-3** in coordination with the CPM, CDFW and USFWS. Nest locations shall be mapped using GPS technology and provided the CPM.

4. **Active Nest Protection.** If surveys detect nesting Northern Goshawks, a 0.25 mile no-disturbance buffer zone shall be implemented around the nests until the end of the breeding season, or a qualified biologist determines that the nest is no longer active. Alternate buffer zones may be proposed if there is compelling ecological justification for the reduction with the approval of the CPM in coordination with the CDFW and USFWS. Alternative buffers must be approved in writing by the CPM in consultation with the CDFW and USFWS. The Designated Biologist or Biological Monitor shall monitor the nest until it is determined that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.

5. **Accidental Nest Disturbance.** The project owner or Designated Biologist shall notify the CPM, CDFW, and USFWS within 48 hours if an active nest fails and if the failure was project related or predation.

6. **Reporting.** The Designated Biologist shall prepare a Northern Goshawk Survey Report and submit the document to the CPM for review and approval and the CDFW and USFWS for comment. Throughout the construction phase of the project, nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be updated and available to the CPM daily. Nest data and, if applicable, nest activity monitoring results and any adaptive management actions taken, will be provided to CPM, CDFW, and USFWS in monthly monitoring reports, as data becomes available and if specific nest monitoring or any adaptive management actions are taken, and summarized in annual project monitoring reports. All buffer reduction notifications and prompt notifications of nest-related non-compliance and corrective actions will be made via email to the CPM, CDFW and USFWS. At the end of each year's nest season, the project owner shall submit an annual report to the CPM, CDFW, and USFWS. Specific contents and format of the annual report will be reviewed and approved by the CPM in consultation with CDFW and USFWS.

Verification: The project owner shall submit the resumes of the proposed Northern Goshawk biologists and avian monitors no less than 45 days prior to conducting the surveys and or site mobilization whichever comes first. The project owner shall submit pre-construction survey reports to the CPM, CDFW, and USFWS no more than 30 days after each survey effort has been completed. The project owner shall provide a letter report detailing the outcome of any nest failures to the CPM and the CDFW within 14 days of the incident.

AVIAN AND BAT MORTALITY MONITORING AND ADAPTIVE MANAGEMENT PLAN

BIO-28 The Project owner shall prepare and implement an Avian and Bat Mortality Monitoring Plan. The Plan shall be developed by a CPM approved biologist in coordination with the CDFW, USFWS, and Technical Advisory Committee identified under **BIO-29** (Implement a Technical Advisory Committee for Birds and Bats). The Plan shall include any specific actions identified in the USFWS bald and golden eagle take permit which is a requirement for this project including the number of electric pole retrofits or other actions. The Plan will require post operation mortality surveys to estimate mortality rates for different species of birds and bats from collisions with WTGs or other structures, to identify individual WTGs or groups/strings of WTGs that cause unanticipated levels of mortality, and to determine whether the mortality thresholds included as part of this Plan have been reached. The Plan shall include mean estimated fatalities and 90% confidence intervals for species or appropriate bird and bat groups. The plan shall include training of project operations staff in handling and reporting avian fatalities encountered in the course of their regular activities. The selection of which WTGs to monitor may be adjusted from year to year (or as appropriate).

1. **Postconstruction Fatality Monitoring Requirements.** The project owner shall implement a comprehensive postconstruction monitoring program for a minimum of five years beginning on the commercial operation date of Project operations. Monitoring may continue beyond five years if construction is completed in phases (i.e., if individual turbines are brought into operation as they are constructed and connected to the transmission system). If the results of the first five years indicate that baseline fatality rates are exceeded, monitoring will be extended until the average annual fatality rate has dropped below baseline fatality rates for three years and to assess the effectiveness of adaptive management measures. At year 12 of operations the project owner shall conduct an additional two years of monitoring.

    a. **Postconstruction Fatality Reporting.** For fatality reporting after year 1, calculate annual fatality estimate (total fatalities and fatalities/MW installed capacity) for comparison to bat and bird mortality thresholds.

i. Calculate monthly fatality estimates (total fatalities and fatalities/ MW installed capacity) to inform adjustments to curtailment season, if necessary. Provide TAC with a curtailment event spreadsheet (date, time, and duration of curtailment events, see **BIO-30**). Submit fatality data to the Renewable Energy Wildlife Institute (REWI) database after review and approval by the CPM in coordination with the CDFW, USFWS, and TAC.

b. **Postconstruction Fatality Timing.** The project owner shall provide monthly and annual reports including raw carcass counts to the CPM, CDFW, USFWS, and TAC.

i. Monthly reports shall be submitted no more than 14 days after the end of each month.

ii. Provide an estimate of the anticipated annual fatality estimate including survey method used, carcass detectability, searcher efficiency, and raw carcass count results to the CPM, CDFW, USFWS, and TAC.

iii. Annual Final Report: Submit final reports to the CPM, CDFW, USFWS, and TAC no later than 30 days after the end of each operation year.

2. **Mortality Monitoring Footprint.** The design of the study should follow recommendations of the CEC Guidelines or improved methodologies based on coordination with the TAC, CPM, CDFW, and USFWS, including methods for carcass search surveys, scavenger studies, evaluation of researcher efficiency, data analysis and reporting methodology. Specifically, carcass searches shall occur once every week at a minimum of 30% of the WTGs. In addition, fatality monitoring for birds and bats shall be performed in an area three times the total rotor swept area of one turbine per turbine row or at least 25% or at least the minimum number that provides statistical meaningful results, of the total number of turbines. Monitoring shall occur for all 12 months of the year in 7-day intervals and may include using search dogs. Any searches that are cancelled due to unsafe weather conditions will be reported to the CPM and included in monthly reports. To select turbines, stratify turbines by fatality risk (e.g., high/med/low or high/low) based on results from the initial first year fatality monitoring period. Use stratified random sampling to select an equal number of turbines in each risk group. Use this selection for all five monitoring years. For turbines that were non-operational during the initial five-year period, assume those are medium risk turbines unless data suggests otherwise. If a monitored turbine breaks down (becomes non-operational) during the monitoring period, searches shall be moved to another turbine that is operational and at the same assumed risk level.

3. **Implement Flight Monitoring Systems Throughout the Project Area.** The project owner shall emplace an Automated flight monitoring and identification systems to detect and identify birds in flight that may be at risk of collision with wind turbines. A flight monitoring and identification system (such as IdentiFlight or similar system approved by the CPM in coordination with the CDFW and USFWS) shall be installed within the project area to reduce impacts to eagles, other raptors, cranes, and special status passerines. The flight monitoring systems shall provide the maximum monitoring coverage that the existing topography allows. Details regarding the number and placement of monitoring units will depend on the technical aspects of the turbine model, topography, and other factors. The project owner shall develop a Flight Monitoring and Identification System Plan to provide the number locations where the systems will be emplaced. Monitoring and identification systems shall be installed no later than 3 months after the commencement of commercial operation. The systems shall be maintained in place for the life of the project and data collected shall be shared with the CPM, CDFW, USFWS, and the TAC bi-annually to inform adaptive management strategies, if applicable.

4. **Acoustic Deterrence.** The project owner shall implement acoustic deterrence systems to reduce impacts to birds and bats. The systems shall be installed and affixed to the wind turbines at select turbines to be proposed by the project owner in consultation with the CPM, CDFW, USFWS, and the TAC. The acoustic deterrents shall be of a design similar to those described by Weaver et al. (2020). The design of the study and implementation of acoustic deterrence shall be reviewed by the CPM and the TAC. The CPM in coordination with the TAC will base continued use, modification, and/or discontinued use of acoustic deterrence based on the results on their use and effectiveness on the site.

5. **Stationary Post-construction Biological Monitoring.** Immediately following the operational start date, a biological observation monitor(s) shall be stationed on the project site to observe and monitor real-time wildlife interactions occurring within and adjacent to the project area for a period of five years. The monitor shall have the ability to contact the control room and suggest curtailing a turbine if large birds are at risk of collision. Such interactions may include flyovers, real-time wildlife collisions with turbines, nesting birds and/or foraging birds and bats. This data will provide valuable and rare insight into how wildlife is actively interacting with a recently altered environment, specifically wind operations. The project owner shall provide weatherproof observation posts located at key areas to allow the biologists to operate during inclement weather. Safety considerations shall be considered during the timing of post construction monitoring to account for heavy snow fall. During this monitoring period the monitor shall note:

a. Compare pre- and post-construction bird use on the site; to assess the effects of the project on avian species; to assist in determining whether additional mitigation elements are necessary; and to collect research data to better understand wind power industry impacts and provide regulatory agencies with data for future projects.

6. **Placement of MOTUS Towers.** Two motus towers (Wildlife tracking system or equivalent) shall be installed and maintained, for the life of the project. These motus towers will be placed on existing MET towers or other structures, depending on access logistics. Receiving stations shall be placed in locations with adequate height and visibility (e.g., at the top of a hill, not in a valley) so that the detection radius is maximized across the site. All bat and birds' detections shall be made publicly available for the life of the project, as facilitated by the existing Motus data network. If possible, the tower will have power and cell access to facilitate automated data uploads to the Motus data network. Otherwise, data shall be input manually at the end of each month for the life of the project. The Motus receiving stations shall be installed as soon as logistically possible, ideally at the starting operational date but no later than 6 months post operational start date.

7. **Adaptive Management.** Adaptive management shall be implemented in the event that bird or bat mortality exceeds specified threshold levels identified below. Mortality levels are based on one calendar year of operation.

   a. Level 1 – Mortality Thresholds

      i. One fatality of a State or federally listed species including proposed, candidate, or fully protected species.

      ii. Two fatalities (birds or bats) of any California species of special concern, Forest Service Sensitive, or Watch List Species.

      iii. Three fatalities of any non-listed raptors or owls (including barred owls)

   b. Level 2 – Mortality Thresholds

      i. Two fatalities of a State or federally listed species including proposed, candidate, or fully protected species.

      ii. Three fatalities (birds or bats) of any California species of special concern, Forest Service Sensitive, or Watch List Species.

      iii. Five fatalities of any non-listed raptors or owls (including barred owls)

   c. Level 1 – First Alert and Enhanced Survey

i. If recorded bird or bat fatalities reach the threshold criteria for Level 1, the project owner shall notify the CPM, CDFW, and USFWS within TAC within 24 hours by email communication.

ii. Increase carcass search frequency in the vicinity of the specific WTG(s) suspected of being responsible to better understand the causal factors and circumstances contributing to the fatalities. Carcass search patterns and extent may be modified, survey frequency may be increased up to twice per week, and supplementary field observations may be required for up to six months, if necessary to assess the pattern or frequency of fatalities. The additional information would facilitate a more informed response in the event that mortality levels reach Level 2. The project owner shall provide weather and wind velocity data for the area of the fatalities to evaluate if adverse conditions resulted in the collisions.

iii. Mortality monitoring shall conclude if fatalities remain below Level 2 thresholds for 2 consecutive years or a different period if the project owner or biologist can provide compelling evidence the mortality was related to seasonal migration or other factor. The period can only be modified with the approval of the CPM in coordination with the CDFW, USFWS, and the TAC. If Level 2 thresholds are reached or exceeded, the CPM may require additional year(s) of monitoring until fatalities fall below Level 2 thresholds.

d. Level 2 – Response Options

i. If recorded bird or bat fatalities reach the threshold criteria for Level 2, the project owner shall notify the CPM, CDFW, and USFWS within TAC within 24 hours by email communication.

ii. The Level 2 thresholds might also be reached based on the annual mortality statistics, which would be reported in the annual reports of the mortality study.

iii. The cause of bird and bat fatalities at wind farms is often indeterminate, due to the condition of the carcasses, activity of scavengers, and wide radius of land fall. The CPM, CDFW, USFWS, and TAC shall require Level 2 response options only if it determines with reasonable certainty that the fatalities are caused by wind farm operations and which WTGs are at cause. The determination must be based on substantial evidence. Changes in bird use of the site observed in the monitoring studies shall be considered in the evaluation of impacts and response options. Measures required must be reasonable, feasible, and specifically targeted to reduce fatalities at the particular problem

WTG(s). Where specific actions can be addressed to offset mitigation for target species such as sandhill cranes or other species where habitat enhancement or other actions can be achieved, the project owner shall fund those actions to offset individual impacts to lost birds and their young. For large birds an equivalency analysis shall be completed to account for the individual birds and the loss of reproductive years.

iv. Should fatality monitoring reveal that impacts exceed the baseline thresholds established by the TAC, the TAC shall advise the project owner on the implementation of adaptive management measures listed in supplemental adaptive management plans for birds and bats. Adjustment to the next operation year's adaptive management response shall be agreed upon no later than the next TAC meeting and implemented no later than the following TAC meeting or other, depending on step and season refinements. Such measures shall not be undertaken without appropriate environmental review, if applicable. Less extreme, less costly measures shall be exhausted before more extreme or costly measures are required. However, the project will be required to ensure that adequate mitigation and or off-sets are being implemented to account for the take of special status birds and bats.

Verification: The project owner shall submit the Avian and Bat Mortality Monitoring Plan, proposed MOTUS and IdentiFlight locations 90 days prior to the operation of the facility for approval by the CPM in coordination with the CDFW, USFWS, and TAC. The project owner shall notify the CPM, CDFW, and USFWS, and TAC no more than 24 hours the CPM, CDFW, and USFWS if Level-1 or Level-2 thresholds are crossed.

IMPLEMENT A TECHNICAL ADVISORY COMMITTEE FOR BIRDS AND BATS

BIO-29 The project owner in coordination with the CPM, CDFW, and USFWS shall form a Technical Advisory Committee (TAC) to oversee and implement science-based monitoring plans and species-specific strategies to avoid, reduce, and mitigate impacts to bats and birds. The TAC shall participate in post construction monitoring programs, assist in the establishment of mortality thresholds for birds and bats should mortalities exceed Level-1 and Level-2 thresholds identified in **BIO-28**, and advise the implementation the adaptive management measures that may be necessary if fatality rates exceed maximum mortality thresholds.

1. **TAC Participants.** The TAC shall comprise representatives from the CEC, technical consultants, state and federal resource agencies, including but not limited to CDFW and USFWS, and local stakeholders. The TAC will be a voluntary and advisory group that will provide

guidance for the long-term management of operations to further avoid and minimize impacts to biological resources.

2. **Roles and Responsibilities of the TAC.** The TAC shall assist in the development of performance standards and feasible measures to meet those standards, to review and advise on project planning documents to ensure that project-specific mitigation measures and compensatory mitigation measures are appropriately and consistently applied, to review and advise on monitoring documents (protocols and reporting) for consistency with the Conditions of Certification, and to review and advise on implementation of the adaptive management strategies.

   The TAC's structure and authority is advisory, and the recommendations and conditions recommended by the TAC will be considered by the CPM in consultation with the CDFW and USFWS. The recommendations of the TAC shall be non-binding however, the recommendations shall be evaluated by the CPM, CDFW, and USFWS for their efficacy in reducing project related impacts and ensuring compliance with existing regulations, permit conditions, and COCs. TAC, in consultation with state and federal resource agencies shall review, interpret, and provide recommendations regarding study design and results of pre-construction habitat assessments and surveys, construction-related monitoring and minimization measures, post construction mortality monitoring and adaptive management including operational measures that will most efficiently minimize impacts on bird and bat populations.

3. **TAC Meetings.** The TAC will have a standing meeting, which will be open to the project owner, agencies, and the public, every 6 months to review bat and bird fatality monitoring reports monitoring reports and annual nesting bird survey reports. A summary of the meeting will be completed by the project owner and Provided to the CPM and TAC no later than 30 days after each meeting.

Verification: The project owner shall provide documentation of the formation of the TAC to the CPM for approval and the CDFW and USFWS within 60 days of site mobilization. The project owner shall notify the CPM, CDFW, and USFWS, and TAC of the proposed meeting schedules no less than 30 days prior to each meeting. Meeting notes and proposed actions shall be provided to the CPM no later than 14 days following each meeting.

IMPLEMENT SEASONAL CURTAILMENT

BIO-30 The project owner shall implement seasonal and or smart curtailment of the wind turbine generators (WTGs) based on seasonality and or specific wind conditions to reduce collision risk to sensitive bats. Turbine hub-height wind speeds will be used to implement curtailment (i.e., ground-level wind speeds will not be used for curtailment implementation). Curtailment shall be based on the following conditions.

1. **Curtailment Below Manufacturer's Cut-In Speeds.** The project owner shall implement the following. All blades will be pitched out to reduce RPM to 1 or less at all turbines at all times (i.e., year-round, day and night) and curtailment above manufacturer's cut-in speed at night (sunset to sunrise) only unless the project owner can demonstrate the infeasibility of such a proposal to the satisfaction of the CPM in coordination with the CDFW and USFWS.

    a. The all-bat threshold curtailment will be implemented in a stepwise progression as described below:

        i. **Step 1:** Blanket curtailment at 5.5 m/s for 5 months (May – September) and at 5.0 m/s for October

        ii. Step 2: Blanket curtailment at 5.5 m/s for 6 months (April – September) and at 5.0 m/s for October

        iii. Step 3: Blanket curtailment at 6.0 m/s for 6 months (April – September) and at 5.0 m/s for October

    b. If Step 1 brings the mean all-bat fatality rate below the 0.85 bats/MW/year threshold after 1 year, then Step 1 may be maintained for an additional year and monitoring shall continue through the entire three-year adaptive management monitoring period. If it does not, then Step 2 will be implemented for at least one year.

    c. If Step 2 brings the mean all-bat fatality rate below the 0.85 bats/MW/year threshold, then Step 2 may be maintained for an additional year and monitoring shall continue through the entire three-year adaptive management monitoring period. If the threshold is not met for each year individually, then Step 3 will be implemented for the remainder of the project.

2. **Revisions to Seasonal Curtailment.** Revisions to the specific months chosen within the curtailment season (April to October) may be made if approved by the CPM after consultation with the TAC, during the adaptive management monitoring period if justified based on new information about bat activity, such as results of acoustic monitoring at the nacelle level, Motus migration and movement research, and/or regional habitat use assessments. However, any curtailment during the month of October will not exceed a cut-in speed of 5.0 m/s.

3. **Smart Curtailment.** As a potential alternative to blanket curtailment, the creation and implementation of a smart curtailment strategy to reduce project related bat mortalities is acceptable. Smart curtailment considers additional variables such as precipitation, real-time acoustic bat detection, and temperature to create a more tailored mitigation strategy. A well-designed smart curtailment strategy can result in less energy loss than blanket curtailment while being more effective at preventing mortality (Rabie et al. 2022; Squires et al 2021; Hayes et al

2019). Any proposed smart curtailment strategy shall be reviewed and approved by the CPM and CDFW in consultation with the TAC. If adopted, a study shall be designed to measure the effectiveness of the strategy.

Verification: The project owner shall provide documentation to the CPM, CDFW, USFWS, and the TAC that seasonal curtailment and turbine curtailment speeds is being achieved. The project owner shall provide written verification no later than 14 days after each operational month of curtailment to the CPM, CDFW, and USFWS, and TAC.

LAKE AND STREAMBED EQUIVALENCY CONDITIONS

BIO-31 The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to jurisdictional waters of the State and to satisfy requirements of California Fish and Game Code, sections 1600 through 1607.

1. **Verification of Permanent and Temporary Impacts.** The project owner shall prepare and submit an updated Delineation of State and Federal Waters Report that clearly defines all jurisdictional features by jurisdiction (USACE Section 401, RWQCB Section 404, and CDFW jurisdictional waters) that are present in all temporary and permanent impact areas. The report shall define the methods used to delineate each water and provide maps and GIS data for each feature. The Report shall provide a table of the linear feet of impact and acreage for permanent and temporary impacts.

2. **Copies of Requirements, Stop Work Authority:** The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures identified in this condition of certification and any other water related permit conditions to all contractors, subcontractors, and the applicant's project supervisors. This includes copies of the USACE Section 404 and RWQCB Section 401 permits as required by Water-5. Copies shall be maintained at each work site and be readily available during periods of active work and must be presented to any CEC or CDFW upon demand. The CPM reserves the right to issue a stop work order after giving notice to the project owner, if the CPM, in consultation with CDFW, determines that the project owner is not in compliance with any of the requirements of this condition, including but not limited to the existence of any of the following:

   a. The information provided by the applicant regarding streambed alteration is incomplete or inaccurate;

   b. New information becomes available that was not known to the Energy Commission or the CDFW at the time of project certification; or

c. The project or project activities as described in the Staff Assessment/ Final Environmental Impact Statement have changed.

3. **General Species Protection Measures.** Species specific protection measures including surveys and monitoring are included in separate COCs. General protective conditions are identified below.

4. **Daily Clearance Survey.** Before the start of daily project activities, the designated biologist should survey the project area to ensure there is no wildlife incidentally trapped due to project activities and all are allowed to escape on their own volition.

5. **Aquatic Species Surveys.** If project activities or dust abatement activities will occur within a river, lake, or stream, then a designated biologist who is knowledgeable in the identification of listed fish and amphibian species shall survey the project area prior to initiating operations within or immediately adjacent to the watercourse. If a listed species or evidence of their presence is found, work shall be suspended and consulted with CDFW unless a specific condition of certification provides prescriptive measures for that species.

6. **Maintain Aquatic Life.** When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, allow sufficient water at all times to pass downstream to maintain aquatic life below the obstruction pursuant to Fish and Game Code, section 5937.

7. **Stranded Aquatic Life.** Check daily for stranded aquatic life as the water level in the dewatering area drops. All reasonable efforts shall be made to capture and move all stranded aquatic life observed in the dewatered areas. Capture methods may include fish landing nets, dip nets, buckets and by hand. Captured aquatic life shall be released immediately in the closest body of water adjacent to the work site. This condition does not allow for the take or disturbance of any State or federally listed species, or State listed species of special concern.

   a. **Fish Passage.** Fish passage facilities shall be incorporated into any temporary barrier that obstructs fish passage.

   b. **Flow Velocities.** All diversion channels shall be designed to maintain velocities at levels acceptable to fish species.

   c. **Electrofishing Restrictions.** No electrofishing shall occur as a method of relocation unless authorized in writing by the CPM with concurrence from CDFW staff.

   d. **Relocated Aquatic Wildlife Records.** A record shall be maintained of all relocated reptiles, fish, and amphibians. The record shall include the date of capture and relocation, the method of capture, the location of the relocation site in relation to the project site, and the number and species of reptiles, fish and amphibians

captured and relocated. The record shall be provided to CPM and CDFW within two weeks of the completion of the work at each crossing.

8. **Best Management Practices:** The project owner shall comply with the following conditions to protect drainages near the project disturbance area:

   a. **No In-Water Work.** The project owner shall not operate vehicles or equipment in ponded or flowing water except as described in this condition.

   b. **Stream Diversion.** When work in a flowing stream is unavoidable, stream flow shall be diverted around or through the work area during construction operations. Any proposed diversion plan shall be submitted to the CPM for approval and the CDFW for review and concurrence.

   c. **Gravity Flow.** Stream flow shall be diverted using gravity flow through temporary culverts/pipes or pumped around the work site with the use of hoses. Any alternative methods shall be included in the Diversion Plan.

   d. **Coffer Dams.** Prior to the start of construction, a stream shall be diverted around or through the work area and the work area shall be isolated from the flowing stream. To isolate the work area, watertight coffer dams shall be constructed upstream and downstream of the work area and water diverted, through a suitably sized pipe, from upstream of the upstream coffer dam and discharge downstream of the downstream coffer dam. Coffer dams shall be constructed of a non-erodible material which does not contain soil or fine sediment. Coffer dams and a stream diversion system shall remain in place and functional throughout the construction period. Coffer dams or stream diversions that fail for any reason shall be repaired immediately.

   e. **Drafting.** Drafting water from any creek, stream, seep, pond, or river is not authorized.

   f. **Minimize Work During Periods or Rain or Snow.** Project activities within any bed, channel, or bank shall be conducted from June 1 to October 15, during the low or no-flow period whenever possible.

   g. **Work in Dry Weather.** The National Weather Service 72-hr forecast for the project area shall be monitored and project activities within the riparian zone shall be limited to forecasted periods of 40% chance or less of light precipitation (less than ¼-inch per 24-hour period). If a greater than 40% chance of more than ¼-inch of precipitation within a 24-hour period is forecast within 72 hours of

ground-disturbing project activities, all activities within the riparian zone shall cease until the criteria are met.

h. **Moving Equipment.** When any activity requires moving of equipment across a flowing drainage, such operations shall be conducted without substantially increasing stream turbidity. Vehicles driven across drainages when water is present shall be completely clean of petroleum residue and water levels shall be below the vehicles' axels.

i. **Materials.** Rock, gravel, and/or other materials shall not be taken from the bed, channel, or bank of any river, lake, or stream.

j. **Temporary Fill.** All temporary fills shall be constructed of pre-approved, non-erodible materials and fill areas shall have a liner between the bottom of the fill and the river, lake, or stream sediments. Following project activity completion, all temporary fill material shall be removed and the disturbed portions of the bed, channel, and bank shall be returned to previous contours. Minor amounts of fill material that have sunk into the sediment below the natural channel bottom may remain, but only if there is no accretion in bed or channel elevation above the original contour.

k. **Disturbed Soils.** Disturbed soils shall be stabilized to reduce erosion potential. Planting, seeding with sterile native species (especially those species that support California native pollinators), and mulching is acceptable. Where suitable vegetation cannot reasonably be expected to become established, non-erodible materials, such as coconut fiber matting, shall be used for stabilization.

l. **Bank Stabilization.** Suitable, non-erodible materials that will withstand wash out shall be used for bank stabilization. Only clean material such as rock riprap free of trash, debris and deleterious material shall be used as bank stabilization, and placement shall extend above the normal high-water mark. Asphalt and broken concrete are not acceptable materials.

m. **Rock Slope Protection.** Un-grouted rock and energy dissipater materials used for rock slope protection (RSP) shall consist of clean rock, competent for the application, sized and properly installed to resist washout. RSP slopes shall be supported with competent boulders keyed into a footing trench with a depth sufficient to properly seat the footing course boulders and prevent instability (typically at least 1/3 diameter of footing course boulders). RSP for slopes and footing trenches shall feature an underlayment of appropriate grade geo-textile fabric on slopes less than 1:1, or

gravel blanket on slopes greater than 1:1. Topsoil shall be used to fill voids between rocks to provide a substrate for revegetation efforts.

n. **Specifications for Placing Rock.** A footing trench along the toe of slope shall be excavated or other engineered design approved by the CPM. The larger rocks shall be placed (not dumped) in the footing trench. Rocks shall be placed with their longitudinal axis normal to the embankment face and arranged so that each rock above the foundation course has a three-point bearing on the underlying rocks. Foundation course is the course placed on the slope in contact with the ground surface. Bearing on smaller rocks which may be used for chinking voids is not acceptable. Local surface irregularities of the slope protection shall not vary from the planned slope by more than one foot measured at right angles to the slope.

o. **Operating Equipment and Vehicle Leaks.** Any equipment or vehicles driven and/or operated within or adjacent to any lake or stream shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat.

p. **Clean Equipment Prior to Entering Stream.** All heavy equipment that will be entering the live stream shall be cleaned of materials deleterious to aquatic life including oil, grease, hydraulic fluid, soil and other debris prior to entering the water.

q. **Stationary Equipment Leaks.** Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to any lake or stream shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak.

r. **Equipment Maintenance and Fueling.** No equipment maintenance or fueling shall be done within or near any stream channel or lake margin where petroleum products or other pollutants from the equipment may enter these areas.

s. **Equipment Storage.** Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of a stream channel and banks and contained in a leakproof berm or other secondary containment.

t. **Staging and Storage Areas.** Staging and storage areas for equipment, materials, fuels, lubricants, and solvents shall be located more than fifty (50) feet from a stream channel and banks. All equipment and fuel stored on site shall be bermed to contain any spilled material and shall be protected from rain. Berms shall consist of plastic covered dirt or sandbags.

u. **Stockpiled Materials.** Building materials and/or construction equipment shall not be stockpiled or stored where they may be washed into the water or cover aquatic or riparian vegetation. Stockpiles shall be covered when measurable rain is forecasted.

v. **Excavation Equipment.** Prior to working within a stream, all equipment shall be closely examined for oil and fuel discharges. Any contaminants shall be cleaned prior to any work within a streambed and shall be maintained daily. In addition, equipment shall be cleaned daily to ensure non-natives are not introduced into or spread throughout project sites.

w. **Remove Structures.** Project-related structures and associated materials not designed to withstand high water flows or placed in seasonally dry portions of a stream or lake that could be washed downstream or could be deleterious to aquatic life, wildlife, or riparian habitat shall be moved to areas above high water before such flows occur.

x. **Location of Spoil Sites.** Spoil sites shall not be located within a lake or stream or locations that may be subjected to high storm flows, where spoils may be washed back into a lake or stream, or where it may impact streambed habitat, aquatic or riparian vegetation.

y. **Removal of Debris, Materials and Rubbish.** All project generated debris, building materials and rubbish shall be removed and properly disposed of in a legal manner, from a stream and from areas within one hundred and fifty (150) feet of the high-water mark where such materials could be washed into a stream following completion of project activities.

z. **Wash Water.** Water containing mud, silt, or other pollutants from equipment washing or other activities, shall not be allowed to enter a lake or flowing stream or placed in locations that may be subjected to high storm flows.

9. Hazardous Materials and Concrete

a. **Hazardous Substances.** Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering the waters of the state.

b. **Toxic Materials.** Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into a stream, or its tributaries shall be contained in watertight containers or removed from the project site.

c. **Hazardous Materials.** Debris, soil, silt, bark, slash, sawdust, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, wildlife, or riparian habitat resulting from the project-related activities shall be prevented from contaminating the soil and/or entering the waters of the state.

d. **Sacked Concrete.** The use of sacked concrete, asphalt pieces or asphalt containing pavement grindings within twenty (20) feet of the top-of-bank of a stream /outside of the ordinary high-water mark is prohibited, or where it may enter the channel.

e. **Concrete – Primary Containment.** Wet concrete shall be contained and prevented from entering any lake or stream unless as authorized by this COC. No concrete shall be poured within the high flow line if the 10-day weather forecast indicates any chance of rain above ¼" in a 24-hour period.

f. **Concrete – Designated Monitor.** At all times when pouring or working with wet concrete a designated monitor shall be present to inspect containment structures and ensure that no concrete or other debris enters into a lake or stream outside of those structures.

g. **Concrete – Secondary Containment.** Secondary containment shall be installed between the primary containment structures (i.e. headwall form, roadway forms) and the lake or stream to prevent wet concrete from entering into the lake or stream upon failure or leak of primary structures. No concrete shall be poured within the high flow line if the 10-day weather forecast indicates any chance of rain above ¼" in a 24-hour period.

h. **Creosote-Treated Wood.** Creosote-treated wood products shall not be used in waters of the state. Alternatives that may be appropriate include steel, concrete, plastic, or wood products treated with preservatives that do not contain creosote or other materials that are deleterious to aquatic life.

i. **Spill Containment.** All activities performed in or near a stream shall have absorbent materials designated for spill containment and cleanup activities on-site for use in an accidental spill. In the event of a spill the project owner shall immediately notify the CPM, CDFW, USACE, RWQCB, and the California Emergency Management Agency at 1-800-852-7550 and immediately initiate the cleanup activities.

10. **Crossings.** With the exception of the retention basins and drainage control system installed for the project the installation of bridges, culverts, or other structures shall be such that water flow (velocity and

low flow channel width) is not impaired. Bottoms of temporary culverts shall be placed at or below stream channel grade.

a. **Design Plans.** The plans for all permanent bridges, culverts, at grade crossing, or other structures placed in jurisdictional waters shall be designed to accommodate a 100-year storm event. The engineered drawings and hydrologic studies used to design the structures shall be provided to the CPM and the CDFW prior to constructing any permanent crossing.

b. **Sized to Accommodate Storm Flows.** All crossing sites shall be designed to accommodate the estimated 100-year flow including sediment load and debris without diverting and shall be installed in accordance with design plans and diagrams. Culvert sizing factors shall include culvert capacity loss from placement of the culvert pipe bottom below stream bed grade, transportation of bed load, and the abundance and size of woody debris likely to be introduced to a stream upstream of the culvert crossing, in addition to the 100-year flow.

c. **Alignment.** All crossing structures shall be properly aligned within a stream and shall be otherwise designed and sized to assure resistance to washout and erosion of a streambed, stream banks, and/or fill.

d. **Single Pipes Only.** Completed culvert pipe installations shall result in water flow that is neither impeded nor impounded at the pipe inlet, nor accelerated downstream of the crossing structure.

e. **Aquatic Life Movement.** Installation of bridges, culverts or other structures shall be such that water flow is not impaired and upstream or downstream passage of fish and all aquatic life-forms is assured at all times. Ensure that any debris is cleared if the structure is in place. Any structure or culvert placed on fish bearing watercourses shall be designed, constructed, and maintained such that it does not constitute a barrier to upstream or downstream movements of all life stages of fish, and shall comply with CDFW's "Culvert Criteria for Fish Passage" (May 2002).

f. **Inlet and Outlet Protection.** Culvert inlets and outlets shall be protected from erosion as appropriate through armoring constructed of rock riprap or other non-erodible material (e.g., concrete head wall). Where used, rock riprap or armoring shall be of sufficient size and depth to remain in place during 100-year peak flows (generally 12 inch or greater diameter or equal to the largest size that naturally exists in the channel), extend at least as high as the top of the pipe on inlets, and shall extend sufficient distance upstream as wing walls to prevent bank erosion. Where armoring is used, the channel at the

culvert outlet shall be rip-rapped in a U-shaped channel and riprap set below grade so as to allow the natural accumulation of bedload at watercourse grade.

g. **No Headcutting.** Crossings shall be constructed in a manner that minimizes headcutting of a stream channel above the crossing to the extent feasible by installing grade control structures such as riprap, woody debris, or through other effective measures, and to preclude the development of an increase in stream gradient below the crossing through downcutting.

h. **Single Pipes Only.** Multiple-pipe crossings shall not be constructed or reconstructed within the bankfull channel unless approved by the CPM in coordination with the CDFW.

i. **Crossing Fill.** All crossing backfills shall be free of rocks, limbs or other debris (greater than six inches diameter) that could dent the pipe or allow water to seep around the pipe. The crossing backfill base and sidewall material shall be compacted before the pipe is placed in its bed. A minimum amount of fill material shall be used for the bed to reduce seepage into and along the fill. Backfill material shall be compacted (i.e., with a vibrating, gas powered hand compacter) at regular intervals (i.e. 0.5-to-1.0-foot lifts) until at least 2/3 of the diameter of the culvert has been covered.

11. Vegetation

a. **Demarcation of Work Areas.** All work areas shall be adequately marked to prohibit unauthorized and unnecessary disturbance to vegetation. All areas shall be mapped and identified on plans for all project personnel.

b. **Vegetation Disposal.** All native vegetation not proposed for salvage (i.e., cuttings) shall be chipped and left on-site in a manner optimizing erosion control purposes in accordance with the recommendations of an erosion control specialist. All non-native vegetation shall be removed and disposed of at an approved disposal location according to state and local laws and ordinances.

c. **Hand tools Near Mature Trees.** Wherever possible, hand tools shall be used (i.e. chainsaws, clippers, brush whackers, etc.) to remove vegetation located near mature native trees as to not damage trees or disturb the substrate. The use of heavy equipment may be used to clear large areas of non-native vegetation. No equipment shall be used in areas with slopes greater that 2:1 unless authorized to construct a particular crossing.

d. **Remove Debris from Stream Zones.** All removed vegetation and debris shall be moved outside the normal high-water mark prior to

inundation by water. All removed vegetation and debris shall be disposed of according to state and local laws and ordinances.

e. **Minimum Removal.** Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. The disturbed portions of any stream channel or lake margin within the high-water mark of a stream or lake shall be restored to as near their original condition as possible.

f. **Stabilize Exposed Areas.** All exposed/disturbed areas within the project site shall be stabilized to the greatest extent possible.

g. **Seed and Mulch.** Upon completion of construction operations and/or the onset of wet weather, stabilize exposed soil areas within the work area by applying mulch and seed. Restore all exposed or disturbed areas and access points within a stream and riparian zone by applying local native and weed free erosion control grass seeds. Locally native wildflower and/or shrub seeds may also be included in the seed mix. Mulch restored areas using at least two to four inches of weed-free clean straw or similar biodegradable mulch over the seeded area. Alternately, cover seeding with jute netting, coconut fiber blanket, or similar non-synthetic monofilament netting erosion control blanket.

h. **Sudden Oak Death.** Do not move the plant species, including their plant parts, plant products (including dried wreaths), and unprocessed wood and wood products (including, but not limited to bark chips, mulch, and firewood – except when completely free of bark) listed in Section 3700 of the California Department of Food and Agriculture Plant Quarantine Manual: http://pi.cdfa.ca.gov/pqm/manual/pdf/455.pdf from project sites located in Sudden Oak Death (*Phytophthora ramorum*) quarantine counties, which include Alameda, Contra Costa, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties, except as provided by that section. Implement BMPs during project activities in Sudden Oak Death quarantine counties to prevent the spread and introduction of Sudden Oak Death to new areas. BMPs specific to the preventing the spread of Sudden Oak Death are available at the California Oak Mortality Task Force website: http://www.suddenoakdeath.org/diagnosis-and-management/best-management-practices/.

12. Herbicide Use

a. **General.** Since the toxicological properties of various herbicides (including pesticides, insecticides and rodenticides) cannot be predicted under all conditions, CDFW discourages herbicide application near open water wherever and whenever possible.

Integrated pest management solutions that emphasize non-chemical pest management shall be used over chemical pesticides to the extent feasible.

b. **Herbicide/Pesticide Use Permitted in Accordance with Law.** All herbicide use conditions for mixing, application and clean-up shall conform to all applicable federal, state, and local regulations. Nothing in this Agreement represents an herbicide/pesticide use recommendation that allows for an action that conflicts with herbicide/pesticide use regulations.

c. **Licensed Applicators Only.** Any application of herbicide shall be overseen by a licensed applicator in accordance with all applicable, federal, state, local laws, and/or guidelines.

d. **Prevent Overspray of Herbicides/Pesticide.** Conduct all treatment activities in a manner to minimize overspray of herbicide on to adjacent native vegetation and where there is no potential of contamination to a river, stream or waters of the state.

e. **Herbicide/Pesticide Mixing.** Ensure that herbicide-mixing sites are located in areas devoid of vegetation, and where there is no potential of a spill reaching a vegetated area or a river, stream or waters of the state.

f. **Avoid Treatment in Sensitive Areas.** Areas identified as sensitive by the designated biologist or with suspected occupied nesting or denning habitats shall not be treated with pesticides or herbicides. Environmental damage caused by the application or use of substances that prove harmful to fish and aquatic wildlife per Fish and Game Code section 5650 shall not occur.

13. **Invasive Species Control and Special Status Species Protection Measures** have been included in separate COCs.

14. Mitigation for Permanent and Temporary Impacts to Riparian Vegetation

a. **Acquire Off-Site State Waters.** The project owner shall acquire, in fee or in easement, a parcel or parcels of land that includes no fewer than 3 times the acreage of any riparian or sensitive vegetation or habitat permanently converted from the placement of fill, permanent structure, or modified as a shaded fuel break. Impact acreages will be tallied based on the updated Jurisdictional Delineation and the Completion of an as-built study to verify the amount of habitat converted or disturbed by the proposed project.

i. The parcel or parcels comprising the acreages shall include the same types of vegetation disturbed by the project. This compensation acreage may be included (“nested”) within the

acreage acquired and managed Forest Habitat required under (Condition of Certification Forest 1 and Forest 2) only if:

ii. Adequate acreage of qualifying state-jurisdictional streambed is within the forest compensation lands; and

iii. The Forest compensation lands are acquired and dedicated as permanent conservation lands within 18 months of the start of project construction.

iv. If these two criteria are not met, the project owner shall provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and to comply with other related requirements this condition.

b. **Compensation Lands Acquisition Requirements.** The project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

i. **Preliminary Report.** The project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM and CDFW. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM with concurrence from CDFW. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

ii. **Title/Conveyance.** The project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFW, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM/USFS or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFW or another entity approved by the CPM. If an entity other than CDFW holds a conservation easement over the compensation lands, the CPM may require that CDFW or another entity approved by the CPM, in consultation with CDFW, be named a third-party beneficiary of the conservation easement. The project owner shall obtain approval of the CPM of the terms of any

transfer of fee title or conservation easement to the compensation lands.

iii. **Initial Protection and Habitat Improvement.** The project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. A non-profit organization, CDFW or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFW, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee.

iv. **Property Analysis Record.** Upon identification of the compensation lands, the project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

v. **Long-term Maintenance and Management Funding.** The project owner shall deposit in an Account, or other CPM approved entity, a capital long-term maintenance and management fee in the amount determined through the Property Analysis Record (PAR) or PAR-like analysis conducted for the compensation lands.

The CPM, in consultation with CDFW, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision. In addition to the costs listed above, the project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from

other state agency reviews, overhead related to providing compensation lands to CDFW or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

c. **Mitigation Security.** The project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR report. Prior to submitting proof of the Security to the CPM, the project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the project owner's obligations under this condition, and the project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the project owner in whole or in part upon successful completion of the associated requirements in this condition.

Verification: The project owner shall provide the updated Jurisdictional Report that clearly delineates all proposed permanent and temporary impacts, the proposed engineering drawings for each crossing type, and the hydrologic studies used to inform the engineering design to the CPM and CDFW no less than 45 days prior to site mobilization. The project owner shall provide Final Reports and Plans to the CPM and the CDFW no later than 14 days prior to the installation of any engineered crossing, bridge, or new culvert. The project owner shall provide financial assurances to the CPM that any compensatory mitigation lands are adequately funded no less than 60 days prior to operation of the project.

5.2.6 References

Ahlborn 1990 – Ahlborn, G. American Badger Life History Account. California Wildlife Habitat Relationship (CWHR) System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

Ahlborn 2005 – Ahlborn, G. Ringtail Life History Account. California Wildlife Habitat Relationship (CWHR) System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

Airola and Williams 2008 – Airola, D.A. and B.D.C. Williams. Purple Martin (*Progne subis*). Studies of Western Birds 1: 293-299.

Apfelbaum and Haney 1981 – Apfelbaum, S. and A. Haney. Bird populations before and after wildfire in a Great Lakes pine forest. Condor 83: 347-354.

Arnett 2006 – Arnett, E.B. A Preliminary Evaluation on the Use of Dogs to Recover Bat Fatalities at Wind Energy Facilities. Wildlife Society Bulletin 34(5): 1440-1445.

Aubry and Raley 2006 – Aubry, K.B. and C.M. Raley. Ecological characteristics of fishers (Martes pennanti) in the Southern Oregon Cascade Range, Update: July 2006. Unpublished report. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Olympia Forestry Sciences Laboratory, Olympia, WA.

Audubon 2024a – National Audubon Society. Important Bird Areas: IBA Overlays. Accessed on June 5, 2024. Accessed online at: https://gis.audubon.org/portal/apps/sites/?_gl=1*1jcbx1*_gcl_au*MzI5MzA2MDAuMTczMjEyNDU0NQ..*_ga*ODYwMzcyMi4xNzMyMTI0NTQ2*_ga_X2XNL2MWTT*MTczMjgzODc3OC4zLjAuMTczMjgzODc3OC42MC4wLjA.#/nas-hub-site/pages/iba-overlays

Audubon 2024b – National Audubon Society. Important Bird Areas: IBA Explorer, Fall River Valley. Accessed on June 5, 2024. Accessed online at: https://gis.audubon.org/portal/apps/sites/?_gl=1*po4k5q*_gcl_au*MzI5MzA2MDAuMTczMjEyNDU0NQ..*_ga*ODYwMzcyMi4xNzMyMTI0NTQ2*_ga_X2XNL2MWTT*MTczMjgzODc3OC4zLjEuMTczMjgzOTE3Mi42MC4wLjA.#/nas-hub-site/pages/data-review

Audubon 2024c – National Audubon Society. Important Bird Areas: IBA Explorer, McCloud River – Upper. Accessed on June 5, 2024. Accessed online at: https://gis.audubon.org/portal/apps/sites/?_gl=1*po4k5q*_gcl_au*MzI5MzA2MDAuMTczMjEyNDU0NQ..*_ga*ODYwMzcyMi4xNzMyMTI0NTQ2*_ga_X2XNL2MWTT*MTczMjgzODc3OC4zLjEuMTczMjgzOTE3Mi42MC4wLjA.#/nas-hub-site/pages/data-review

Baker 1993 – Baker, J.M. Habitat use and spatial organization of pine marten on southern Vancouver Island, British Columbia. Master's thesis. Simon Fraser University, Burnaby, BC, Canada. 134 pp.

Ballard et al. 1987 – Ballard, W.B., J.S. Whitman, and C.L. Gardner. Ecology of an exploited wolf population in south-central Alaska. Wildlife Monographs No. 98. Washington D.C. The Wildlife Society. 54 pp.

Barber et al. 2009 – Barber, J.R., K.M. Fristrup, C.L. Brown, A.R. Hardy, L.M. Angeloni, and K.R. Crooks. Conserving the wildlife therein: Protecting park fauna from anthropogenic noise. Park Science 26(3): 26-31.

Bates 2006 – Bates, C. Burrowing Owl (*Athene cunicularia*). In The Draft Desert Bird Conservation Plan: a strategy for reversing the decline of desert-associated birds in California. California Partners in Flight.

Baum and Sharber 2012 – Baum, K.A. and W.V. Sharber. Fire creates host plants matches for monarch butterflies. Biol. Lett. 8: 968-971.

Beakes et al., 2014. Beakes, M.P., J.W. Moore, S.A. Hayes, and S.M. Sogard. Wildfire and the effects of shifting stream temperature on salmonids. Ecosphere 5(5): 1-14.

Beetle 1997 – Beetle, D.E. Recolonization of burned aspen groves by land snails. Yellowstone Science 5(3): 6-8.

Benson et al. 2005 - Benson, J.F., J.D. Perrine, R.T. Golightly, Jr., and R.H. Barrett. Use of cover and response to cover type edges by female Sierra Nevada red foxes in winter. Western North American Naturalist 65(1): 127-130.

Bent 1940 – Bent, A.C. Life histories of North American cuckoos, goatsuckers, hummingbirds, and their allies. Smithsonian Institution United States National Museum Bulletin 176. 505 pp.

Bent 1937 – Bent, A.C. Life histories of North American birds of prey pt. 1: Order Falconiformes. Bulletin of the United States National Museum. 409 pp.

Bleich et al. 2008 – Bleich, V.C., H.E. Johnson, S.A. Holl, L. Konde, S.G. Torres, and P.R. Krausman. Fire history in a chaparral ecosystem: Implications for conservation of a native ungulate. Rangel. Ecol. Manage. 61: 571-579.

Boal and Mannan 1994 – Boal, C.W. and R.W. Mannan. Northern goshawk diets in ponderosa pine forest on the Kaibab Plateau. Studies in Avian Biology 16: 97-102.

Boer 1989 – Boer, C. Effects of the forest fire 1982-83 in East Kalimantan on wildlife. FR Report No. 7. Samardinda, Indonesia, Deutsch Forest Service. 20 pp.

Bond 2015 – Bond, M.L. Mammals and Mixed- and High-severity Fire: in the Ecological Importance of Mixed-Severity Fires: Nature's Phoenix. DellaSala, D.A. and C.T. Hanson, editors. Elsevier, Inc.

Bond et al. 2009 – Bond, M.L. D.E. Lee, R.B. Siegel, and J.P. Ward. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73: 1116-1124.

Borchert 2014 – Borchert, M.I. Responses of small mammals to wildfire in a mixed conifer forest in the San Bernardino Mountains, California. Bulletin of Southern California Academy of Science 113: 81-95.

Borchert and Borchert 2013 – Borchert, M.I. and S. Borchert. Small mammal use of the burn perimeter following a chaparral wildfire in southern California. Bulletin of Southern California Academy of Science 112: 63-73.

Bradford 1991 – Bradford, D.F. Mass mortality and extinction in a high-elevation population of *Rana muscosa*. Journal of Herpetology 25(2): 174-177.

Brebner et al. 2021 – Brebner, J.S., J.C. Makinson, O.K. Bates, N. Rossi, K.S. Lim, T. Dubois, T. Gomez-Moracho, M. Lihoreau, L. Chittka, and J.L. Woodgate. Bumble bees strategically use ground level linear features in navigation. Animal Behaviour 179: 147-160.

Briggs 1987 – Briggs, J.L., Sr. Breeding Biology of the Cascades Frog, *Rana cascadea*, with Comparisons to *R. pretiosa*. Copeia 1987(1): 241-245.

Brodhead 2005 – Brodhead, K.M. The Influence of Riparian-Canopy Structure and Coverage on the Breeding Distribution of Southwestern Willow Flycatcher. Master's thesis, Montana State University, Bozeman, MT. 112 pp.

Broley 1947 – Broley, C.L. Migration and nesting of Florida Bald Eagles. Wilson Bulletin 59: 3-20.

Brusati and Johnson 2015. California Department of Fish and Wildlife. State Wildlife Action Plan: A plan for conserving California's wildlife resources while responding to environmental challenges. Appendix F – Invasive Species in California.

Buchalski et al. 2013 – Buchalski, M.R., J.B. Fontaine, P.A. Heady III, J.P. Hayes, and W.F. Frick. Bat Response to Differing Fire Severity in Mixed-Conifer Forest California, USA. PLoS ONE 8(3): e57884.

Bumble Bee Atlas 2024 – Bumble Bee Atlas: A Conservation Initiative by the Xerces Society and Partners to Track and Conserve Bumble Bees. Accessed on June 18, 2024. Accessed online at: https://www.bumblebeeatlas.org/pages/about

Burke et al. 1999 – Burke, T.E., J.S. Applegarth, and T.R. Weasma. Management recommendations for Survey and Manage terrestrial mollusks. Version 2.0. Bureau of Land Management.

Bury 1972 – Bury, R.B. The effects of diesel fuel on a stream fauna. Calif. Fish and Game 58(4): 291-295.

Bury and Germano 2008 – Bury, R.B. and D.J. Germano. *Actinemys marmorata* (Baird and Girard 1852) – Western Pond Turtle, Pacific Pond Turtle. Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group.

Buskirk 1992 – Buskirk, J.R. "An Overview of the Western Pond Turtle, *Clemmys marmorata*". Pp. 001.1-001.9. In Rhodin, A.G.J. et al. (eds.). Conservation biology of freshwater turtles and tortoises: a compilation project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs. No. 5.

Buskirk and Powell 1994 – Buskirk, S.W. and R.A. Powell. Habitat ecology of fishers and martens. In Buskirk, S.W., A.S. Harestad, M.G. Raphael (eds.) Martens, sables, and fishers: biology and conservation. Cornell University Press, Ithaca, NY. Pp. 283-296.

Cal-IPC 2024 – California Invasive Plant Council. The CAL-IPC Inventory. Accessed March 3, 2024. Accessed online at: https://www.cal-ipc.org/plants/inventory/

Cane and Neff 2011 – Cane, J.H. and J.L. Neff. Predicted fates of ground-nesting bees in soil heated by wildfire: Thermal tolerances of life stages and a survey of nesting depths. Biological Conservation 144: 2631-2636.

Cardno, Inc. 2020. Cardno, Inc. Nationwide Candidate Conservation Agreement for Monarch Butterfly on Energy and Transportation Lands. Energy Resources Center at University of Illinois at Chicago.

Carey et al. 1992 – Carey, A.B., S.P. Horton, and B.L. Biswell. Northern spotted owls: influence of prey base and landscape character. Ecological Monographs 62(2): 223-250.

Carreker 1985 – Carreker, R.G. Habitat suitability index models: snowshoe hare. U.S. Department of Agriculture, U.S. Department of Interior, U.S. Fish and Wildlife Service, Research and Development, Western Energy and Land Use Team, Division of Biological Sciences, Washington D.C. 21 pp.

CBD 2017 – Center for Biological Diversity. Petition to list the foothill yellow-legged frog (*Rana boylii*) as threatened under the California Endangered Species Act.

CDFA 2024 – California Department of Food and Agriculture. Encycloweedia: Weed Ratings. Accessed March 3, 2024. Accessed online at: https://www.cdfa.ca.gov/plant/IPC/encycloweedia/winfo_weedratings.html

CDFW 2024a – California Department of Fish and Wildlife. Habitat Conservation Planning Branch. Fully Protected Animals. Accessed online at: https://wildlife.ca.gov/Conservation/Fully-Protected

CDFW 2024b – California Department of Fish and Wildlife. Biogeographic Data Branch. California Natural Diversity Database. Special Animals List. October 2024.

CDFW 2024c – California Department of Fish and Wildlife. Biogeographic Data Branch. Natural Communities. Accessed online at: https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities#sensitive%20natural%20communities

CDFW 2024d – California Department of Fish and Wildlife. Biogeographic Data Branch. California Natural Diversity Database. Special Vascular Plants, Bryophytes, and Lichens List. October 2024.

CDFW 2024e – California Department of Fish and Wildlife. Biogeographic Data Branch. California Natural Diversity Database. RareFind v. 5. Accessed March – December 2024. Accessed online at: https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data

CDFW 2024f – California Department of Fish and Wildlife. Snowshoe Hare: *Lepus americanus*. Wildlife Branch – Wildlife Diversity Program. Accessed on July 2, 2024. Accessed online at: https://wildlife.ca.gov/Conservation/Mammals/Snowshoe-Hare#:~:text=Adult%20snowshoe%20hares%20weigh%20about,coats%20are%20generally%20rusty%20brown.

CDFW 2023 – California Department of Fish and Wildlife. Biogeographic Data Branch. California Sensitive Natural Communities. June 1, 2023.

CEC and CDFG 2007 –California Energy Commission and California Department of Fish and Game. California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Commission Final Report. California Energy Commission, Renewables Committee, and Energy Facilities Siting Division, and California Department of Fish and Game, Resources Management and Policy Division. CEC-700-2007-008-CMF.

Chapman 1979 – Chapman, R.C. Human disturbance at wolf dens – a management problem. Pages 323-328. In Proceedings of the 1st Conference Scientific Research in the National Parks. Edited by R.M. Linn. U.S. National Park Service, Proceedings Series Number 5, Volume 1.

Chase 2017 – Chase, J. Effect of Wildfires on Rattlesnakes (*Crotalus oreganus*) Growth and Movement in Washing State. Master's Thesis. 915 pp.

Choi et al. 2020 – Choi, D.Y., T.W. Wittig, and B.M. Kluever. An evaluation of bird and bat mortality at wind turbines in the Northeastern United States. Research Article, PLOS ONE. 22 pp.

CNPS 2024 – California Native Plant Society. Policy on the Use of Herbicide in Situations that May Affect Native Vegetation. Adopted March 8, 2008; updated September 7, 2024. Sacramento, CA.

Collins and Roller 2013 – Collins, B.M. and G.B. Roller. Early forest dynamics in stand-replacing fire patches in northern Sierra Nevada, California, USA. Landscape Ecol 28: 1801-1813.

Collins et al. 2000 – Collins, P.W., N.F.R. Snyder, and S.D. Emslie. Faunal remains in California condor nest caves. Condor 102: 222-227.

Comfort et al. 2015 – Comfort, E.J., R.G. Anthony, and M.G. Betts. Quantifying edges as gradients at multiple scales improved habitat selection models for northern spotted owl. Landscape Ecology; DOI 10.1007/s10989-015-0330-1. Accessed on August 10, 2024. Accessed online at: https://www.researchgate.net/publication/289538503_Quantifying_edges_as_gradients_at_multiple_scales_improves_habitat_selection_models_for_northern_spotted_owl

Corcoran and Weller 2018 – Corcoran, A.J. and T.J. Weller. Inconspicuous echolocation in hoary bats (*Lasiurus cinereus*). Proc. R. Soc. B. 285: 20180441.

COS 2004 – County of Shasta. General Plan. Section 6.7 Fish and Wildlife Habitat. Accessed online at: https://www.shastacounty.gov/media/63201

COSEWIC 2014 – Committee on the Status of Endangered Wildlife in Canada. Assessment and status report on the Western Bumble Bee Bombus occidentalis in Canada. 52 pp.

Cottrille and Cottrille 1958 – Cottrille, W.P. and B.P. Cottrille. Great blue heron: behavior at the nest. University of Michigan Museum Zoological Publication No. 102. 15 pp.

Coulombe 1971 – Coulombe, H.N. Behavior and Population Ecology of the Burrowing Owl, *Speotyto cunicularia*, in the Imperial Valley of California. The Condor 73: 162-176.

Courtney et al. 2004. Courtney, S.P., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, J.F. Franklin, R.J. Gutierrez, J.M. Marzluff, and L. Sztukowski. Scientific evaluation of the status of northern spotted owl. Sustainable Ecosystems Institute.

Cox 1991 – Cox, C. Pesticides and Birds: From DDT to Today's Poisons. Journal of Pesticide Reform 11(4): 2-6.

Crooks and Soule 1996 – Crooks, K.R. and M.E. Soule. Mesopredator release and avifaunal extinctions in a fragmented system. Nature 400: 563-566.

DeCasare and Pletscher 2006 – DeCesare, N.J. and D.J. Pletscher. Movements, connectivity, and resource selection of Rocky Mountain bighorn sheep. Journal of Mammalogy 87(3): 531-538.

Delaney et al. 1999 – Delaney, D.K., T.G. Grubb, P. Beier, and M.H. Reiser. Effects of helicopter noise on Mexican spotted owls. Journal of Wildlife Management 63(1): 60-76.

Derby et al. 2018 – Derby, C.E., M.M Welsch, and T.D. Thorn. Whooping Crand and Sandhill Crane Monitoring at Five Wind Energy Facilities. Proceedings of the North American Crane Workshop 14: 26-34.

Dietrich and Woodbridge 1994 – Dietrich, P.J. and B. Woodbridge. Territory fidelity, mate fidelity, and movements of color-marked northern goshawks in the southern Cascades of California. Studies in Avian Biology 16: 130-132.

Diller et al. 2016 – Diller, L.V., K. A. Hamm, D.A. Early, D.W. Lamphear, K.M. Dugger, C.B. Vackulic, C.J. Schwartz, P.C. Carlson, and T.L. McDonald. Demographic Response of Northern Spotted Owls to Barred Owl Removal. The Journal of Wildlife Management; DOI: 10.1002/jwmg.1046

Dillon and Dudley 2014 – Dillon, M.E. and R. Dudley. Surpassing Mt. Everest: Extreme flight performance of alpine bumble bees. The Royal Society Biology Letters 10(2): 20130922. Accessed on June 19, 2024. Accessed online at: https://www.researchgate.net/publication/260117939_Surpassing_Mt_Everest_Extreme_flight_performance_of_alpine_bumble-bees

Dodds et al., 2015 – Dodds, W.K., K. Gido, M.R. Whiles, M.D. Daniels, and B.P. Grudzinski. The Stream Biome Gradient Concept: factors controlling lotic systems across broad geographic scales. Freshwater Science 34(1): 1-19.

Donato et al., 2012 – Donato, D.C., J.L. Campbell, and J.F. Franklin. Multiple successional pathways and precocity in forest development: can some forests be born complex. Journal of Vegetation Science 23: 576-584.

Donnelly et al. 2021 – Donnelly, J.P., S.L. King, J. Knetter, J.H. Gammonley, V.J. Dreitz, B.A. Grisham, M.C. Nowak, and D.P. Collins. Migration efficiency sustains connectivity across agroecological networks supporting sandhill crane migration. Ecosphere 12(6): 1-22

Dunham et al., 2003. Dunham, J.B., M.K. Young, R.E. Gresswell, and B.E. Rieman. Effects of fire on fish populations: landscape perspectives on persistence of native fishes and nonnative fish invasion. Forest Ecology Management 178: 183-196.

Durkin 2007 – Durkin, P.R. Preparation of Environmental Documentation and Risk Assessments for the USDA/Forest Service.

eBird 2024 – Online database. Accessed March – December 2024. Accessed online at: https://ebird.org/home

ESRI 2024 – Esri. Living Atlas – Wildfire Aware. Accessed on July 8, 2024. Accessed online at: https://livingatlas.arcgis.com/wildfireaware/#@=-121.803,39.819,11,22CAD814-48B1-4460-A368-F50F493F3740

Fahrig et al. 1995 – Fahrig, L., J.H. Pedlar, S.E. Pope, P.D. Taylor, and J.F. Wegner. Effect of road traffic on amphibian density. Biological Conservation 73: 177-182.

Fellers and Drost 1993 – Fellers, G.M. and A.D. Drost. Disappearance of the Cascades Frog *Rana cascadae* at the Southern End of its Range, California, USA. Journal of Biological Conservation 65: 177-181.

Ferrer et al. 2012 – Ferrer, M., M. de Lucas, F. Guyonne, E. Janss, E. Casado, A.R. Munoz, M.J. Bechard, and C.P. Calabuig. Weak relationship between risk assessment studies and recorded mortality in wind farms. Journal of Applied Ecology 49: 38-46.

FHWA 2019 – Federal Highway Administration. Managing the Impacts of Blast-Induced Vibration and Overpressure on Fish and Fish Habitat. Publication No. FHWA-FLH/TD-19-001. 85 pp.

Field et al. 2009 – Field, J.P., J. Belnap, D.D. Breshears, J.C. Neff, G.S. Okin, J.J. Whicker, T.H. Painter, S. Ravi, M.C. Reheis, and R.L. Reynolds. The ecology of dust. Front Ecol. Environ. doi:10.1890/090050

Fitch 1938 – Fitch, H.S. *Rana boylii* in Oregon. Copeia 1938(3): p. 148.

Forsman et al. 2005 – Forsman, E.D., T.J. Kaminski, J.C. Lewis, K.J. Maurice, and S.G. Sovern. Home range and habitat use of northern spotted owls on the Olympic Peninsula, Washington. J. Raptor. Res. 39(4): 365-377.

Franklin and Gutierrez 2002 – Spotted owls, forest fragmentation, and forest heterogeneity. Studies in Avian Biology 25: 203-220.

Franklin et al. 2000 – Franklin, A.B., D.R. Anderson, R.J. Gutierrez, and K.P. Burnham. Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California. Biological Monographs 70(4): 539-590.

Friedenberg, N.A., and W.F. Frick. 2021. Assessing fatality minimization for hoary bats amid continued wind energy development. Biological Conservation 262:109309.

Fuller 1989 – Fuller, T.K. Population dynamics of wolves in northcentral Minnesota. Wildlife Monographs No. 105. Washington, D.C. The Wildlife Society. 41 pp.

FWPA – Fountain Wind Project Application (TN 248288-6). DEIR Biological Resources, dated July 2020. Accessed online at: https://efiling.energy.ca.gov/Lists/Docket Log.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248288-15). DEIR Noise and Vibration, dated, July 2020. Accessed online at: https://efiling.energy.ca.gov/Lists/Docket Log.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248289-1). FEIR Vol1, dated April 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docket number=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248289-2). FEIR Vol2, dated April 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docket number=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248290-1). Noise Report, dated December 20, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/ DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248294). FEIR Appendices Part1, dated April 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog. aspx?docketnumber=23-OPT-01

FWPA – Fountian Wind Project Application (TN 248297-2). CEQA Initial Study, dated April 6, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog. aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248301). CEQA Scoping Report Part1, dated March 20, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/ DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248305-1). 2017 Raptor Nest Survey Report, dated September 19, 2018. Accessed online at: https://efiling.energy.ca. gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248305-2). 2018-2019 Foothill Yellow-Legged Frog Surveys, dated December 20, 2019. Accessed online at: https:// efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248305-3). 2018 Eagle Nest Surveys, dated September 19, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248305-4). 2018 Foothill and Cascades Frog Surveys, dated October 22, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248306-1). 2018 Willow Flycatcher Surveys, dated October 17, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248306-2). 2019 Nest Surveys, dated September 5, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248306-3). 2019 Willow Flycatcher Habitat Assessment, dated November 6, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248306-4). 2018 Northern Goshawk Surveys, dated October 15, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountian Wind Project Application (TN 248307-1). Condor Risk Assessment, dated February 12, 2020. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248307-2). Aquatic Resources Report, dated December 23, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248307-3). Bat Survey Report, dated October 22, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248307-4). Bio Resources Figure Index, dated January 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248307-5). Spotted Owl Risk Assessment, dated February 24, 2020. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-1). 2021 Rare Plant Surveys, dated, October 29, 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-2). eDNA Foothill Yellow-Legged Frog Surveys, dated January 16, 2020. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-3). Golden Eagle Survey Clarification Memo, dated January 7, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-4). Northern Goshawk Memo, dated October 29, 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-5). 2018 Great Gray Owl Habitat Assessment, dated October 24, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-6). Nocturnal Migrant Risk Summary, dated October 10, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-7). 2018 Rare Plant and Vegetation Mapping, dated December 20, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-8). 2019 Rare Plant and Vegetation Mapping, dated December 20, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248308-9). Rare Plant Clarification Memo, dated January 10, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248309-1). 2019 Avian Use Study, dated September 5, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248309-2). Response to 2018-2019 Raptor Survey Questions, dated January 24, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248309-3). Response to Informal Consultation Request, dated November 6, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248309-4). 2021 Spotted Owl Memo, dated October 29, 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248309-5). 2018 Avian Use Study, dated November 5, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248318). Site Characterization Study, dated January 2017. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-1). LSAA Summary of Aquatic Impacts, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-2). LSAA Application, dated September 2, 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-4). LSAA Aquatic Resources Report, dated December 23, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountian Wind Project Application (TN 248329-5). LSAA Crossing Designs, dated September 10, 2020. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-6). LSAA Figure 1 Project Overview, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-7). LSAA Figure 2 Aquatic Impacts, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountian Wind Project Application (TN 248329-8). LSAA Final MMRP, dated April 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-9). LSAA Site Photos, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248329-10). LSAA Special Status Species Table, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249635). General Plan Consistency Matrix, dated April 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249636). Laws, Ordinances, Regulations, and Standards Consistency Matrix, dated April 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249926). fwp_bio-001_species-list, dated May 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249927). fwp_bio_002_005_026_027_030_spotted_owl_memo, dated April 14, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249928). fwp_bio-19_ggo_records, dated May 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249929). fwp_bio_003_007_008_009_representative_site_photos, dated May 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249930). fwp_bio-019_ggo_records_table, dated May 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249937). fwp_bio-015_goea_mous, dated March 19, 2019. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249939). fwp_bio_response_spreadsheet, dated May 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250506). bio_fwp_round2_responses, dated June 2, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250814). fwp_WR2-04_SurfaceWater Hydrology24k, dated June 29, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250949). fwp_rwqcb_responses_2023-0705, dated July 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251061). RarePlantSpotCheck_Survey Plan_06092023, dated June 9, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251062). CSO_SurveyPlan_2023_0609 2023, dated June 9, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251112). fwp_CSO_SurveyPlan_2023, dated July 20, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251114). fwp_data_request_responses_2023-0721. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 253167). Fountain 2023 Rare Plant Spot Check Report_092823, dated September 28, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 253168). 2023 California Spotted Owl Surveys_111323, dated November 13, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 253505). fwp_fire_Fountain Wind Tech Report_December 4, 2023, dated December 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254350). fwp_responses_to_post-scoping_data_requests, dated February 5, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254875). Questions on Information Pertinent to CalFire Contained in Applicant Wildfire Technical Report, dated February 20, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254899). Impacts of Project Related to Wildfire, Firefighting, and Aerial Firefighting Capacity, dated November 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Gaines 2005 – Gaines, D. Willow Flycatcher. California Wildlife Habitat Relationships (CWHR) System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group. Life History Accounts for species in the California Wildlife Habitat Relationships System. Accessed on May 10, 2024. Accessed online at: https://www.fs.usda.gov/detail/tahoe/landmanagement/resourcemanagement/?cid=stelprdb5357314

Ganey et al. 2017 – Ganey, J.L., H.Y. Wan, S.A. Cushman, and C.D. Vojta. Conflicting Perspectives on Spotted Owls, Wildfire, and Forest Restoration. Fire Ecology 13(3): 146-165.

Garwood 2009 – Garwood, J.M. Spatial ecology of the Cascades frog: Identifying dispersal, migration, and resource uses at multiple scales. Arcata, CA: M.S. Thesis, Humboldt State University. 97 pp.

Giusti et al. 1992 – Giusti, G.A., R.H. Schmidt, and R.M. Timm. The lagomorph: rabbits, hares, and pika. In Silviculture approaches to animal damage management in Pacific Northwest forests. Gen. Tech. Rep. PNW-GTR-287. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Gould 2020 - Gould G. Missing Linkages in California's Landscape [ds420]. Accessed on February 12, 2024. Accessed online at: https://map.dfg.ca.gov/metadata/ds0420.html

Goulet and Bird 2021 – Goulet, R. and D.M. Bird. Aspects of the ecology of urban-nesting bald eagles (*Haliaeetus leucocephalus*) in south-coastal British Columbia. Journal of Raptor Research 55(1): 65-78.

Goulson 2010 – Goulson D. Bumblebees: behavior, ecology, and conservation. 2nd ed. Oxford University Press, New York, New York.

Green et al. 2012 – Green, L., M. Hebblewhite, and T.R. Stephenson. Short-term vegetation response to wildfires in the eastern Sierra Nevada: implications for recovering an endangered ungulate. Journal of Arid Environments 87: 118-128.

Gresswell 1999 – Gresswell, R.E. Fire and Aquatic Ecosystems in Forested Biomes of North America. Transactions of the American Fisheries Society 128(2): 193-221.

Grier and Guinn 2003 – Grier, J.W. and J.E. Guinn. Bald eagle habitats and responses to human disturbance in Minnesota. North Dakota State University Department of Biological Sciences.

Griffith et al. 2018 - Griffith, G.E., J.M. Omernik, D.W. Smith, T. Cook, E. Tallyn, K. Moseley, and C.B. Johnson. Ecoregions of California (poster): U.S. Geological Survey Open-File Report 2016-1021, with map scale 1:1,100,000. Accessed online at: https://pubs.usgs.gov/of/2016/1021/ofr20161021_sheet1.pdf

Grodsky et al. 2013 – Grodsky, S.M., C.S. Jennelle, and D. Drake. Bird mortality at a wind-energy facility near a wetland of international importance. Condor 115(4): 700-711.

Grubb and Bowerman 1997 – Grubb, T.G. and W.W. Bowerman. Variations in breeding bald eagle responses to jets, light planes, and helicopters. Journal of Raptor Research 31(3): 213-222.

Grubb et al. 1992 – Grubb, T.G., W.W. Bowerman, J.P. Giesy, and G.A. Dawson. Responses of breeding bald eagles, *Haliaeetus leucocephalus*, to human activities in Northcentral Michigan. The Canadian Field-Naturalist 106(4): 443-453.

Gruver and Keinath 2006 – Gruver, J.C. and D.A. Keinath. Townsend's Big-eared Bat (*Corynorhinus townsendii*): A Technical Conservation Assessment. U.S. Department of Agriculture, Forest Service, Rocky Mountain Region, Species Conservation Project. 92 pp.

Gutierrez et al. 2017 – Gutierrez, R.J., P.N. Manley, and P.A. Stine (tech. eds.). The California spotted owl: current state of knowledge. Gen. Tech. Rep. PSW-GTR-254. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 294 pp.

Habib et al. 2007 – Habib, L., E.M. Bayne, and S. Boutin. Chronic industrial noise affects pairing success and age structure of ovenbirds *Seiurus aurocapilla*. Journal of Applied Ecology 44: 176-184.

Haim and Izhaki 1994 – Haim, A. and I. Izhaki. Changes in rodent community during recovery from fire: relevance to conservation. Biodiversity and Conservation 3: 573-585.

Halfwerk et al. 2011. Halfwerk, W., L.J.M. Holleman, C.M. Lessells, and H. Slabbekoorn. Negative impact of traffic noise on avian reproductive success. Journal of Applied Ecology 48: 210-219.

Halofsky et al., 2020 – Halofsky, J.E., D.L. Peterson, and B.J. Harvey. Changing wildfire, changing forests: the effects of climate change on fire regimes and vegetation in the Pacific Northwest, USA. Fire Ecology 16(4): 1-26.

Halvorsen 1961 – Halvorsen, C.H. Curiosity of the marten. Journal of Mammalogy 42: 111-112.

Hargis et al. 1994 – Hargis, C.D., C. McCarthy, and R.D. Perloff. Home Range and Habitats of Northern Goshawks in Eastern California. Studies in Avian Biology 16: 66-74.

Harris 2024 – Harris, J. Hoary Bat Life History Account. California Wildlife Habitat Relationship (CWHR) System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

Hatfield and LeBuhn 2007 – Hatfield, R.G. and G. LeBuhn. Patch and Landscape Factors Shape Community Assemblage of Bumble Bees, Bombus spp. (Hymenoptera: Apidae), in montane meadows. Journal of Biological Conservation 139: 150-158.

Hatfield et al. 2015 – Hatfield, R., S. Jepsen, R. Thorp, L. Richardson, and S. Colla. *Bombus crotchii*. The IUCN Red List of Threatened Species 2015: e.T44937582A 46440211. Accessed online at: https://www.iucnredlist.org/species/44937582/ 46440211

Hawkins et al. 1997 – Hawkins, J.W., M.W. Lankester, R.A. Lautenschlager, and F.W. Bell. Length-biomass and energy relationships of terrestrial gastropods in northern forest ecosystems. Can. J. Zool. 75: 501-505.

Hayes 2013 – Hayes, M.A. Bats Killed in Large Numbers at United States Wind Energy Facilities. BioScience 63: 975-979.

Hayes and Jennings 1988 – Hayes, M.P. and M.R. Jennings. Habitat Correlates of Distribution of the California Red-Legged Frog (*Rana aurora draytonii*) and the Foothill Yellow-Legged Frog (*Rana boylii*): Implications for Management. Paper presented at Management of Amphibians, Reptiles and Small Mammals in North America symposium. Flagstaff, AZ.

Hayward and Escano 1989 – Hayward, G.D. and R.E. Escano. Goshawk nest-site characteristics in western Montana and northern Idaho. Condor 91: 476-479.

Hobbs 1996 – Hobbs, N.T. Modification of ecosystems by ungulates. J. Wild. Manage. 60(4): 695-713.

Hoefler and Duke 1990 – Hoefler, G. and R. Duke. Snowshoe Hare Life History Account. California Wildlife Habitat Relationship (CWHR) System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

Holland 1991 – Holland, D.C. A synopsis of the ecology and status of the western pond turtle (*Clemmys marmorata*) in 1991. Prepared for the U.S. Fish and Wildlife Service Service, National Ecology Research Center, San Simeon Field Station.

Holland 1986 – Holland, R.F. Preliminary Descriptions of the Terrestrial Natural Communities of California. 146 pp.

Hossack and Pilliod 2011 – Hossack, B.R. and D.S. Pilliod. Amphibian Responses to Wildfire in the Western United States: Emerging Patterns from Short-Term Studies. Fire Ecology 7(2): 129-144.

Huff et al. 2005 – Huff, M.H., N.E. Seavy, J.D. Alexander, and C.J. Ralph. Fire and Birds in Maritime Pacific Northwest. Studies in Avian Biology 30: 46-63.

Hurtreau and Brooks 2011 – Hurtreau, M.D. and M.L. Brooks. Short- and Long-term Effects of Fire on Carbon in US Dry Temperate Forest Systems. BioScience 61(2): 139-146.

iNaturalist 2024 – Online database. Accessed March – December 2024. Accessed online at: https://www.inaturalist.org/observations

Jantzen 2012 – Jantzen, M.K. The influence of edge effects and forest cover on bat activity. Electronic thesis and dissertation repository. 44 pp.

Jennings and Hayes 1994 – Jennings, M.R. and M.P. Hayes. Amphibian and Reptile Species of Special Concern in California. Final Report submitted to the California Department of Fish and Game, Inland Fisheries Division. Contract No. 8023. 255 pp.

Jepsen et al. 2014 – Jespen, S., S.F. Jordan, and R. Huff. Species fact sheet: Western bumble bee (*Bombus occidenatilis*). 6 pp. Accessed on June 18, 2024. Accessed online at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd534364.pdf

Johnson 2024 – Johnson, V. Wolverine Life History Account. California Wildlife Habitat Relationship (CWHR) System. California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

Jones et al. 2016. Jones, G.M., R.J. Gutierrez, D.J. Tempel, S.A. Whitmore, W.J. Berigan, and M.Z. Peery. Megafires: an emerging threat to old-forest species. Ecological Society of America 14(6): 300-306.

Jordan and Black 2015 – Jordan, S.F. and S.H. Black. Conservation assessment for *Helminthoglypta hertelini*, Oregon shoulderband. Original by T.R. Weasma 1998, updated 2015. USDA Forest Service Region 6 and USDI Bureau of Land Management, Oregon and Washington Interagency Special Status and Sensitive Species Program.

Keane 2008 – Keane, J.J. Northern Goshawk (*Accipiter gentilis*). Studies of Western Birds 1: 156-162.

Keane 1999 – Keane, J.J. Ecology of the northern goshawk in the Sierra Nevada, California. Ph.D. dissertation. University of California, Davis. 14 pp.

Kearns et al. 1998 – Kearns, C.A., D.W. Inouye, and N.M. Waser. Endangered Mutualisms: The Conservation of Plant-Pollinator Interactions. Annu. Rev. Ecol. Syst. 29: 83-112.

Kennedy and Fontaine 2009 – Kennedy, P.L. and J.B. Fontaine. Synthesis of Knowledge of the Effects of Fire and Fire Surrogates on Wildlife in U.S. Dry Forests. Special Report. Oregon State University, Corvallis, OR.

Kleist et al. 2018 – Kleist, N.J., R.P. Guralnick, A. Cruz, C. Lowry, and C.D. Francis. Chronic anthropogenic noise disrupts glucocorticoid signaling and has multiple effects on fitness of avian community. PNAS-115:E648-E657.

Knorr 1993 – Knorr, O.A. Black Swift (*Cypseloides niger*) nesting site characteristics: some new insights. Avocetta N° 17: 139-140.

Kovacs et al., 2016 – Kovacs, K.E., K.E. Converse, M.C. Stopher, J.H. Hobbs, M.L. Sommer, P.J. Figura, D.A. Applebee, D.L. Clifford, and D.J. Michaels. Conservation Plan for Gray Wolves in California. California Department of Fish and Wildlife, Sacramento, CA. 329 pp.

KRCRTV 2020 – KRCRTV. Wildlife officials investigate if endangered gray wolf was illegally killed in Shasta County. Accessed on June 8, 2024. Accessed online at: https://m.krcrtv.com/news/local/officials-look-into-whether-wolf-was-illegally-killed-in-shasta-county

Kupferberg 1996 – Kupferberg, S.J. Hydrologic and geomorphic factors affecting conservation of a river-breeding frog (*Rana boylii*). Ecological Applications 6(4): 1332-1344.

Lamberson et al. 1992. Lamberson, R.H., R. McKelvey, B.R. Noon, and C. Voss. A dynamic analysis of northern spotted owl viability in a fragmented forest landscape. Journal of Conservation Biology 6(4): 505-512.

Lanier 2011 – Lanier, C. Potential impacts of groundwater withdrawal and wildfires along the Big Sur River: an assessment of *Oncorhynchus mykiss* habitat. Capstone Projects and Master's Thesis. 30 pp.

Lee and Bond 2015 – Lee, D.E. and M.L. Bond. Occupancy of California Spotted Owl sites following a large fire in the Sierra Nevada, California. Condor, Ornithological Applications 117: 228-236.

Legg 1956 – Legg, K. A Sea-Cave Nest of the Black Swift. The Condor 58(3): 183-187.

Lesmeister et al. 2018. Lesmeister, D.B., R.J. Davis, P.H. Singleton, and J.D. Wiens. Chapter 4: Northern spotted owl habitat and populations: Status and threats. In Spies, T.A., P.A. Stine, R. Gravenmier, J.W. Long, and M.J. Reilly (tech coords.). 2018. Synthesis of Science to Inform Land Management within the Northwest Forest Plan Area. Gen. Tech. Rep. PNW-GTR-966. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 245-299.

Lloyd et al. 2023 – Lloyd, J.D., R. Butryn, S. Pearman-Gillman, and T.D. Allison. Seasonal patterns of bird and bat collision fatalities at wind turbines. Research Article, PLOS ONE. 17 pp.

Loss et al. 2013 – Loss, S.R., T. Will, and P.P. Marra. Estimates of bird collision mortality at wind facilities in the contiguous United States. Biological Conservation 168: 201-209.

Lorz et al. 1979 – Lorz, H.W., S.W. Glenn, R.H. Williams, C.M. Kunkel, L.A. Norris, and B.R. Loper. Effects of selected herbicides on smolting of coho salmon. U.S. Environmental Protection Agency. Environmental Research Laboratory, Corvallis, OR. 115 pp.

Love 2010 – Love B. The bees of the American and Cosumnes Rivers in Sacramento County, California: effects of land use on native bee diversity. M.S. thesis submitted to California State University, Sacramento. 84 pp.

Luensmann 2010 – Luensmann, P. *Falco perigrinus*. In Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.

Malcolm 2018 – Malcolm, S.B. Anthropogenic Impacts on Mortality and Population Viability of the Monarch Butterfly. Annu. Rev. Entomol. 63: 277-302.

Marques et al. 2014 – Marques, A.T., H. Batalha, S. Rodrigues, H. Costa, M.J. Ramos Pereira, C. Fonseca, M. Mascarenhas, and J. Bernardino. Understanding bird collisions at wind farms: An updated review on the causes and possible mitigation strategies. Biological Conservation 179: 40-52.

Maser et al. 1981 – Maser, C., B.R. Mate, J.F. Franklin, and C.T. Dyrness. Natural history of Oregon Coast mammals. Gen. Tech. Rep. PNW-133. U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 496 pp.

Mayer and Laudenslayer 1988 – Mayer, K.E. and W.F. Laudenslayer Jr. (eds.). A Guide to Wildlife Habitats of California. State of California, Resources Agency, Department of Fish and Game. Accessed July 5, 2024. Accessed online at: https://wildlife.ca.gov/Data/CWHR/Wildlife-Habitats

McKelvey et al. 1993 – McKelvey, K., B.R. Noon, and R.H. Lamberson. Conservation Planning for Species Occupying Fragmented Landscapes: The Case of the Northern Spotted Owl. In Biotic Interactions and Global Change. 1993. Kareiva, P.M., J.G. Kingsolver, and R.B. Huey (eds.). Sinauer Assoc., Inc. Sunderland, MA.

Mech et al. 1998 – Mech, L.D., L.G. Adams, T.J. Meier, J.W. Burch, and B.W. Dale. The wolves of Denali. University of Minnesota Press.

Meehan and George 2003 – Meehan, T.D. and T.L. George. Short-term effects of moderate- to high-severity wildfire on a disturbance-dependent flycatcher in northwest California. The Auk 120(4): 1102-1113.

Melathopoulos et al. 2020 – Melathopoulos, A., B. Edmunds, and J. Rivers. How do wildfires affect bees? Oregon State University, OSU Extension Service. Accessed on June 18, 2024. Accessed online at: https://extension.oregonstate.edu/forests/fire/how-do-wildfires-affect-bees

Merriman 2021 – Merriman, J. How Many Birds Are Killed by Wind Turbines. Bird Calls Blog. American Bird Conservancy. Accessed on August 22, 2024. Accessed online at: https://abcbirds.org/blog21/wind-turbine-mortality/

Meyer et al. 1989 – Meyer, J.S., L.L. Irwin, and M.S. Boyce. Influence of habitat fragmentation on spotted owl site selection, site occupancy, and reproductive status in western Oregon. The UW National Parks Service Research Station Annual Reports. Wyoming Scholars Repository, WY, USA.

Miner and Stokes 2005 – Miner, K.L. and D.C. Stokes. Bats in the South Coast Ecoregion: Status, Conservation Issues, and Research Needs. U.S. Department of Agriculture, Forest Service. Gen. Tech. Rep. PSW-GTR-195.

Mock 1976 – Mock, D.W. Pair formation displays of the great blue heron. Wilson Bulletin 88: 185-230.

Moose Camp 2023 – Moose Camp (Moose Camp). Fountain Wind Project. Accessed on December 12, 2023. Accessed online at: https://www.moosecamp.org/fountain-wind-project

Mount and Stephan 1967 – Mount, D.I. and C.E. Stephan. A method for establishing acceptable toxicant limits for fish – malathion and the butoxyethanol ester of 2, 4D. Trans. Amer. Fish. Soc. 98: 185-193. Accessed on June 30, 2024. Accessed online at: https://www.tandfonline.com/doi/abs/10.1577/1548-8659(1967)96%5B185%3AAMFEAT%5D2.0.CO%3B2

NatureServe 2024 – NatureServe Explorer. Accessed on May 3, 2024. Accessed online at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.121067/Trilobopsis_roperi

Navarrete and Griffis-Kyle 2014 – Sandhill crane collisions with wind turbines in Texas. Proceedings of the North America Crane Workshop 12: 65-67.

Norris 1967 – Norris, L.A. Chemical brush control and herbicide residues in the forest environment. In: M. Newton (ed.) Proc. Symposium of Herbicides and Vegetation Management. Corvallis, OR.

NABCI 2022 - North American Bird Conservation Initiative. The State of the Birds, United States of America. Accessed on September 20, 2024. Accessed online at: https://www.stateofthebirds.org/2022/wp-content/uploads/2022/10/state-of-the-birds-2022-spreads.pdf

NSWOEH 2018 – New South Wales Office of Environmental and Heritage. Hygiene guidelines: Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomic, myrtle rust, amphibian chytrid fungus and invasive plants. State of NSW and Department of Planning, Industry and Environment.

Nyhof 2013 – Nyhof, P.E. Basking western pond turtle response to trail use in Mountain View, California. Master's thesis, San Jose State University, San Jose, CA, USA.

Ockinger and Smith 2007 – Ockinger, E. and H.G. Smith. Semi-natural grasslands as population sources for pollinating insects in agricultural landscapes. Journal of Applied Ecology 44: 50-59.

Orloff and Flannery 1992 – Orloff, S.G. and Flannery, A. Wind Turbine Effects on Avian Activity, Habitat Use, and Mortality in Altamont Pass and Solano County Wind Resource Areas 1989-1991. Final Report. Prepared by Biosystems Analysis, Inc. for California Energy Commission. 199 pp.

Osborne et al., 1999 – Osborne, J.L., S.J. Clark, R.J. Morris, I.H. Williams, J.R. Riley, A.D. Smith, D.R. Reynolds, and A.S. Edwards. A landscape-scale study of bumble bee foraging range and constancy, using harmonic radar. Journal of Applied Ecology 36: 519-533.

Pacala and Socolow 2004 – Pacala, S. and R. Socolow. Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies. Science 305: 968-972.

Pagel et al. 2010 – Pagel, J.E., D.M. Whittington, and G.T. Allen. Interim golden eagle inventory and monitoring protocols; and other recommendations. U.S. Fish and Wildlife Service, Division of Migratory Bird Management.

Palmer 1988 – Palmer, R.S. (ed.). Handbook of North American Birds, Vol. 4. Yale University Press, New Haven, CT.

Paquet and Carbyn 2003 – Paquet, P.C. and L. Carbyn. In book: Wild Mammals of North America: Biology, Management, and Conservation. Chapter 23 – Gray Wolf, pp. 482-509.

Paula et al. 2011 – Paula, J., M.C. Leal, M.J. Silva, R. Mascarenhas, H. Costa, and M. Mascarenhas. Dogs as a tool to improve bird-strike mortality estimates at wind farms. Journal for Nature Conservation 19: 202-208.

Perrine 2005 – Perrine, J.D. Ecology of Red Fox (Vulpes vulpes) in the Lassen Peak Region of California, USA. Ph.D dissertation. University of California, Berkeley. 236 pp.

Pilliod et al., In Press – Pilliod, D.S., R.B. Bury, E.J. Hyde, C.A. Pearl, P.S. Corn, Fire and Amphibians in North America. Forest Ecology and Management.

Pitelka et al., 1955 – Pitelka, F.A., P.Q. Tomich, and G.W. Treichel. Breeding Behavior of Jaegers and Owls near Barrow, Alaska. Condor 57(1): 3-16.

Poglayen-Newall and Toweill 1988 – Poglayen-Neuwall, I. and D.E. Toweill. Bassariscus astutus. Mammalian Species 327:1-8.

Pope et al. 2014 – Pope, K., C. Brown, M. Hayes, G. Green, and D. Macfarlane (tech. eds.). Cascades Frog Conservation Assessment. Gen. Tech. Rep. PSW-GTR-244. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 116 pp.

Prezio et al. 1999 – Prezio, J.R., M.W. Lankester, R.A. Lautenschlager, and F.W. Bell. Effects of alternative conifer release treatments on terrestrial gastropods in regenerating spruce plantations. Can. J. For. Res. 29: 1141-1148.

Pustkowiak et al. 2018 – Pustkowiak, S., W. Banaszak-Cibicka, L.E. Mielczarek, P. Tryjanowski, and P. Skorka. The association of windmills with conservation of pollinating insects and wild plants in homogeneous farmland of western Poland. Environmental Science and Pollution Research 25: 6273-6284.

Quinn 2008 – Quinn, J.H. The ecology of the American badger Taxidea taxus in California: assessing conservation needs on multiple scales. Ph.D. dissertation. University of California, Davis. 200 pp.

Quinn 1979 – Quinn, R.D. Effects of Fire on Small Mammals in the Chaparral. Cal-Neva Wildlife Transactions. 9 pp.

Raison et al., 2009. Raison, R.J., R.K. Khanna, K.L.S. Jacobsen, J. Romanya, and I. Serrasolses. Effects of Fire on Forest Nutrient Cycles in Fire Effects on Soils and Restoration Strategies. Eds. A. Cerda and P.R. Robichaud. Oxford Brooks University, Oxford, UK. Accessed July 22, 2024. Accessed online at: https://books.google.com/books?hl=en&lr=&id=Cf6dmFb6FW0C&oi=fnd&pg=PA225&dq=raison+et+al+2009+fires+microclimate&ots=f2a7om5NIu&sig=__GGWZcAy10eI0B1Pu3vUCqQq1k#v=onepage&q=raison%20et%20al%202009%20fires%20microclimate&f=false

Raley et al. 2012 – Raley, C.M., E.C. Lofroth, R.L. Truex, J.S. Yeager, and J.M. Higley. Habitat ecology of fishers in North America: a new synthesis. Pp. 231-254. In Biology and conservation of martens, sables, and fishers: a new synthesis. Aubry, K.B., W.J. Zielinski, M.G. Raphael, G. Proulx, and S.W. Buskirk (eds.). Cornell University Press, Ithaca, NY.

Ramezani et al., 2014 – Ramezani, J., L. Rennebeck, G.P. Closs, and C.D. Matthaei. Effects of fine sediment addition and removal on stream invertebrates and fish: a reach-scale experiment. Freshwater Biology 59: 2584-2604.

Ratcliffe 1993 – Ratcliffe, D.A. The Peregrine Falcon. T & AD Poyser, London, UK.

Rathbun et al. 2002 – Rathbun, G.B., N.J. Scott, Jr., and T.G. Murphy. Terrestrial habitat use by pacific pond turtles in a Mediterranean climate. The Southwestern Naturalist 47(2): 225-235.

Reese and Welsh 1997 – Reese, D.A. and H.H. Welsh. Use of Terrestrial Habitat by Western Pond Turtles, *Clemmys marmorata*: Implications for Management. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles. An International Conference. Pp. 352-357.

Relyea 2005 – Relyea, R.A. The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities. Ecological Applications 15(2) 618-627.

REO 2001 – Regional Ecosystem Office. Northwest Forest Plan. Survey and Manage. Accessed online at: https://www.fs.usda.gov/r6/reo/survey-and-manage/

Rochester et al. 2010 – Rochester, C.J., C.S. Brehme, D.R. Clark, D.C. Stokes, S.A. Hathaway, and R.N. Fisher. Reptile and Amphibian Response to Large-Scale Wildfires in Southern California. Journal of Herpetology 44(3): 333-351.

Rodhouse, T. J., Rodriguez, R. M., Banner, K. M., Ormsbee, P. C., Barnett, J., & Irvine, K. M. (2019). Evidence of region-wide bat population decline from long-term monitoring and Bayesian occupancy models with empirically informed priors. Ecology and evolution, 9(19), 11078-11088.

Rosenberg et al. 2009 – Rosenberg, D., J. Gervais, D. Vesely, S. Barnes, L. Holts, R. Horn, R. Swift, L. Todd, and C. Yee. Conservation Assessment of the Western Pond Turtle in Oregon (*Actinemys marmorata*). U.S. Department of Interior, Bureau of Land Management and U.S. Fish and Wildlife Service.

Rosenfield et al. 1991 – Rosenfield, R.N., J. Bielefeldt, R.K Anderson, and J.M. Papp. Accipiters: status reports. Conference paper, Midwest Raptor Management Symposium and Workshop. January.

Rydell et al. 2010 – Rydell, J., L. Bach, M. Dubourg-Savage, M. Green, L. Rodrigues, and A. Hedenstrom. Bat mortality at wind turbines in northwestern Europe. Acta Chiropterologica 12(2): 261-274.

Sandgren et al. 2013 – Sandgren, C., T. Hipkiss, H. Dettki, F. Ecke, and B. Hornfeldt. Habitat use and ranging behaviour of juvenile golden eagles (*Aquila chrysaetos*) within natal home ranges in boreal Sweden. British Trust for Ornithology, Bird Study 61: 9-16.

Sawyer et al. 2009 – Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. A Manual of California Vegetation. 2nd Edition. California Native Plant Society. Sacramento, CA. Accessed online at: https://vegetation.cnps.org/

Schilling et al. 2013 – Schilling, J.W., K.M. Dugger, and R.G. Anthony. Survival and Home-range Size of Northern Spotted Owls in Southwestern Oregon. J. Raptor Res. 47(1): 1-14.

Schmitt et al. 2000 – Schmitt, C.L., J.R. Parmeter, and J.T. Kliejunas Forest Insect and Disease Leaflet 172: Annosus Root Disease of Western Confers. U.S. Department of Agriculture, Forest Service. 10 pp.

Schwab 2006 – Schwab, N.A. Roost-site selection and potential prey sources after wildland fire for two insectivorous bat species (*Myotis evotis* and *Myotis lucifugus*) in mid-elevation forests of western Montana. Graduate Student Theses, Dissertations, and Professional Papers. 6515.

Schwilk and Keeley 1998 – Schwilk, D.W. and J.E. Keeley. Roden populations after a large wildfire in California chaparral and coastal sage scrub. The Southwestern Naturalist 43(4): 480-483.

Seavy and Alexander 2013 – Seavy, N.E. and J.D. Alexander. Songbird response to wildfire in mixed-conifer forest in south-western Oregon. International Journal of Wildland Fire. CSIRO Publishing.

Sedgwick 2000 – Sedgwick, J.A. Willow Flycatcher (*Empidonax traillii*), version 1.0. In Birds of the World (A.F. Poole and F.B. Gill, editors). Cornell Lab of Ornithology, Ithaca, NY, USA. Accessed on May 10, 2024. Accessed online at: https://birdsoftheworld.org/bow/species/wilfly/1.0/introduction

Serrano et al. 2012. Serrano, A.E., R.A. Relyea, M. Tejedo, and M. Torralva. Understanding of the impact of chemicals on amphibians: a meta-analytic review. Ecology and Evolution 2(7): 1382-1397.

Setser and Cavitt 2003 – Setser, K. and J.F. Cavitt. Effect of Burning on Snakes in Kansas, USA, Tallgrass Prairie. Natural Areas Journal 23(4): 315-319.

Shepard and Barr 1991 – Shepard, W.D. and C.B. Barr. Description of the larva of *Atractelmis* (Coleoptera: Elmidae) and new information on the morphology, distribution, and habitat of *Atractelmis Wawona* Chandler. Pan-Pacific Entomologist 67(3): 195-199.

Shuford and Gardali 2008a – Shuford, W.D. and T. Gardali, editors. PDF of Vaux's Swift account from California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA, and California Department of Fish and Game, Sacramento, CA.

Shuford and Gardali 2008b – Shuford, W.D. and T. Gardali, editors. PDF Yellow-breasted Chat account from California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA, and California Department of Fish and Game, Sacramento, CA.

Shuford and Gardali 2008c – Shuford, W.D. and T. Gardali, editors. PDF of Short-eared Owl account from California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA, and California Department of Fish and Game, Sacramento, CA.

Shuford and Gardali 2008d – Shuford, W.D. and T. Gardali, editors. PDF of Olive-sided Flycatcher account from California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA, and California Department of Fish and Game, Sacramento, CA.

Small 1994 – Small, A. California Birds: Their Status and Distribution. Ibis Publishing Co. Vista, California. 342 pp.

Smallwood 2013 – Smallwood, K.S. Comparing Bird and Bat Fatality-Rate Estimates Among North America Wind-Energy Projects. Wildlife Society Bulletin 31(1): 19-33.

Smallwood and Bell 2020 – Smallwood, K.S. and D.A. Bell. Effects of Wind Turbine Curtailment on Bird and Bat Fatalities. Journal of Wildlife Management 84(4): 685-696.

Smallwood and Bell 2013 – Smallwood, K.S. and D.A. Bell. Effects of Wind Turbine Curtailment on Bird and Bat Fatalities. Journal of Wildlife Management, Research Article, 1-12.

Smallwood and Karas 2008 – Smallwood, K.S. and B. Karas. Avian and Bat Fatality Rates at Old-Generation and Repowered Wind Turbines in California. Journal of Wildlife Management 73(7): 1062-1071.

Sovern et al. 2019 – Sovern, S.G., D.B. Lesmeister, K.M Dugger, M.S. Pruett, R.J. Davis, and J.M Jenkins. Activity Center Selection by Northern Spotted Owls. The Journal of Wildlife Management 83(3): 714-727.

Sovern et al. 2014 – Sovern, S.G., E.D. Forsman, G.S. Olson, B.L. Biswell, M. Taylor, and R.G. Anthony. Barred Owls and Landscape Attributes Influence Territory Occupancy of Northern Spotted Owls. Journal of Wildlife Management 78(8): 1436-1443.

Spencer et al. 2015 – Spencer, W.D., S.C. Sawyer, H.L. Romsos, W.J. Zielinski, R.A. Sweitzer, C.M. Thompson, K.L. Purcell, D.L. Clifford, L. Cline, H.D. Safford, S.A. Britting, and J.M. Tucker. Southern Sierra Nevada fisher conservation easement assessment. Unpublished report produced by Conservation Biology Institute.

Spencer et al. 2010 – Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. California Essential Habitat Connectivity Project: A strategy for conserving a connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highway Administration.

Stehn 2011 – Stehn, T. Whooping Crane Recovery Activities: October, 2010-August, 2011. U.S. Fish and Wildlife Service. 41 pp.

Stehr et al. 2009 – Stehr, C.M., T.L. Linbo, D.H. Baldwin, N.L. Scholz, and J.P. Incardona. Evaluating the effects of forestry herbicides on fish development using rapid phenotypic screens. North American Journal of Fisheries Management 29: 975-984.

Stephens et al. 2016 – Stephens, S.L., J.D. Miller, B.M. Collins, M.P. North, J.J. Keane, and S.L. Roberts. Wildfire impacts on California spotted owl nesting habitat in the Sierra Nevada. Ecosphere 7(11): 01478.

Stephenson and Calcarone 1999 – Stephenson, J.R. and G.M. Calcarone. Southern California mountains and foothill assessment: habitat and species conservation issues. Gen. Tech. Rep. GTR-PSW-175. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 402 pp.

Swanson et al., 2011 – Swanson, M.E., J.F. Franklin, R.L. Beschta, C.M. Crisafulli, D.A. DellaSala, R.L. Hutto, D.B. Lindenmayer, and F.J. Swanson. The forgotten stage

of forest succession: early successional ecosystems on forest sites. Front Ecol Environ 9(2): 117-125.

Taiwo et al., 2018 – Taiwo, D.M., O.J. Oyelowo, T.C. Ogedengbe, and A.I. Woghiren. The Role of Soil Seed Bank in Forest Regeneration. Asian Journal of Research in Agriculture and Forestry 1(4): 1-10.

Taylor et al. 2020 – Taylor, D.A.R., R.W. Perry, D.A. Miller, and W.M Ford. Forest Management and Bats. A 2020 product of the White-nose Syndrome National Plan. 24 pp.

Terborgh et al. 2001. Terborgh, J., L. Lopez, P. Nunez, V.M. Rao, G. Shahabuddin, G. Orihuela, M. Riveros, R. Ascanio, G.H. Adler, T.D. Lambert, and L. Balbas. Ecological Meltdown in Predator-Free Forest Fragments. Science 294: 1923-1925.

Tesky 1995 – *Vulpes vulpes*. In: Fire Effects Information System (FEIS), U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Accessed on June 8, 2024. Accessed online at: https:// www.fs.usda.gov/database/feis/animals/mammal/vuvu/all.html

Tetra Tech 2014 – Tetra Tech. Hatchet Ridge Wind Farm Post-Construction Mortality Monitoring Comprehensive Three Year Report. Hatchet Ridge Wind, LLC. 59 pp.

Tetra Tech 2013 – Tetra Tech. Hatchet Ridge Wind Farm Post-Construction Mortality Monitoring Report Year Two Annual Report. Hatchet Ridge Wind, LLC. 48 pp.

Thelander 1976 – Thelander, C.G. Distribution and Reproductive Success of Peregrine Falcons (*Falco peregrinus anatum*) in California during 1975 and 1976. State of California, Department of Fish and Game, Wildlife Management Branch. Administrative Report No. 76-3. 13 pp.

Thess and Lengsfeld 2022 – Thess, A.D. and P. Lengsfeld. Side Effects of Wind Energy: Review of Three Topics – Status and Open Questions. Sustainability 14: 16186.

Thiel et al. 1998 – Thiel, R.P., S. Merrill, and L.D. Mech. Tolerance by denning wolves, *Canis lupus*, to human disturbance. Canadian Field-Naturalist 122(2): 340-342.

Thomas et al. 1990 – Thomas, J.W., E.D. Forsman, J.B. Lint, E.C. Meslow, B.B. Noon, and J. Verner. A conservation strategy for the northern spotted owl. Interagency Scientific Committee to address the conservation of northern spotted owl.

Thomsen 1971 – Thomsen, Lise. Behavior and Ecology of Burrowing Owls on the Oakland Municipal Airport. The Condor 73(2): 177-192.

Trombulak and Frissell 2000 – Trombulak, S.C. and C.A. Frissell. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14: 18-30.

USDA 2024 – U.S. Department of Agriculture, Forest Service. “Windthrow”. Accessed on August 5, 2024. Accessed online at: https://www.fs.usda.gov/detailfull/r10/ forest-grasslandhealth/?cid=FSEPRD569767

USDA 2006 – U.S. Department of Agriculture, Forest Service. Northern Goshawk Inventory and Monitoring Technical Guide. Gen. Tech. Report WO-71. Washington Office.

USFWS 2024a – U.S. Fish and Wildlife Service. FWS Focus: Western Ridged Mussel. Accessed on May 3, 2024. Accessed online at: https://www.fws.gov/species/western-ridged-mussel-gonidea-angulata

USFWS 2024b – U.S. Fish and Wildlife Service. FWS Focus: Western Pearlshell. Accessed on May 3, 2024. Accessed online at: https://www.fws.gov/species/western-pearlshell-margaritifera-falcata

USFWS 2024c – U.S. Fish and Wildlife Service. FWS Focus: California Red-Legged Frog. Accessed on May 15, 2024. Accessed online at: https://www.fws.gov/species/california-red-legged-frog-rana-draytonii

USFWS 2024d – U.S. Fish and Wildlife Service. FWS Focus: North American Wolverine. Accessed on June 18, 2024. Accessed online at: https://www.fws.gov/species/north-american-wolverine-gulo-gulo-luscus

USFWS 2023 – U.S. Fish and Wildlife Service. Press Release. U.S. Fish and Wildlife Service proposes federal protections for both species of western pond turtle under the Endangered Species Act. Accessed on March 20, 2024. Accessed online at: https://www.fws.gov/press-release/2023-09/us-fish-and-wildlife-service-proposes-federal-protections-both-species#:~:text=The%20U.S.%20Fish%20and%20Wildlife%20Service%20(Service)%20is%20proposing%20federal,under%20the%20Endangered%20Species%20Act.

USFWS 2019a – U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; 12-Month Finding for the California Spotted Owl. Federal Register 84(217): 60371-60372.

USFWS 2019b – U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Threatened Species Status for West Coast Distinct Population Segment of Fisher with Section 4(d) Rule. Federal Register 84(216): 60278-60305.

USFWS 2017 – U.S. Fish and Wildlife Service. Northern Spotted Owl (*Strix occidentalis caurina*) – Draft Species Status Report. Region 1, Oregon Fish and Wildlife Office. 118 pp.

USFWS 2015 – U.S. Fish and Wildlife Service. Fish and Wildlife Coordination Act Report for the Shasta Lake Water Resources Investigation. Prepared for U.S. Bureau of Reclamation, Sacramento, CA.

USFWS 2011 – U.S. Fish and Wildlife Service. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). Region 1, Portland, OR.

USFWS 2010 – U.S. Fish and Wildlife Service. Wind Turbine Guidelines Advisory Committee. Submitted to the Secretary of the Interior, March 4, 2010. 162 pp.

USFWS 2007 – U.S. Fish and Wildlife Service. National Bald Eagle Management Guidelines. 23 pp.

USFWS 1998 – U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Notice of 12-Month Finding on a Petition to List the Northern Goshawk in the Contiguous United States West of the 100th Meridian. Federal Register 64(124): 35183 – 35184.

USFWS no date – U.S. Fish and Wildlife Service. Declining Amphibian Task Force Fieldwork Code of Practice. Accessed online at: https://www.fws.gov/sites/default/files/documents/declining-amphibian-task-force-fieldwork-code-of-practice.PDF

USGS 2018 – U.S. Geological Survey. Effects of Experimental Removal of Barred Owls on Population Demography of Northern Spotted Owls in Washington and Oregon – 2017 Progress Report. Open-file report 2018-1086. Reston, VA.

Valentine et al., 2012 – Valentine, L.E., A. Reaveley, B. Johnson, R. Fisher, and B.A. Wilson. Burning in Banksia Woodlands: How Does Fire-Free Period Influence Reptile Communities? PLoS ONE 7(4): e34448.

Verner no date – Verner, J. Bird Communities of Mixed-Conifer Forests of the Sierra Nevada. Unpublished report. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Forest and Range Experiment Station, Fresno, CA. 26 pp.

Voigt 2021 – Voigt, C.C. Insect fatalities at wind turbines as biodiversity sinks. Conservation Science and Practice 2021;3:e366.

Vrendenburg et al. 2007 – Vredenburg, V.T., R. Bingham, R. Knapp, J.A.T. Morgan, C. Moritz, and D. Wake. Concordant molecular and phenotypic data delineate new taxonomy and conservation priorities for the endangered mountain yellow-legged from (Ranidae: *Rana muscosa*). Journal of Zoology (London) 271: 361-374. In (USDA) U.S. Department of Agriculture, Forest Service. 2014. Brown, C., M.P. Hayes, G.A. Green, and D.C. Macfarlane (eds.). Mountain Yellow-Legged Frog Conservation Assessment for the Sierra Nevada Mountains of California, USA. R5-TP-038.

Waser et al. 2017. Waser, N.M., M.V. Price, and G. Casco. Effects of road dust on the pollination and reproduction of wildflowers. International Journal of Plant Sciences 178(2): 85-93.

Weir and Corbould 2008 – Weir, R.D. and F.B. Colbourd. Ecology of fishers in sub-boreal forests of north-central British Columbia. Peace/Williston Fish and Compensation Program, Prince George, British Columbia, Canada. Final Report PWFWCP Report No. 315.

Welsh et al. 2006. Welsh, H.H., K.L. Pope, and D. Boiano. Sub-alpine amphibian distribution related to species palatability to non-native salmonids in the Klamath Mountains of northern California. Diversity and Distributions 12: 298-309.

Weschler and Tronstad 2024 – Weschler, M. and L. Tronstad. Wind energy and insects: reviewing the state of knowledge and identifying potential interactions. PeerJ DOI 10.7717/peerj.18153. 52 pp.

Williams et al. 2014 – Williams, P.H., R.W. Thorp, L.L. Richardson, and S.R. Colla. The Bumble Bees of North America: An Identification Guide. Princeton University Press, Princeton, NJ.

Wisdom et al. 2006 – Wisdom, M.J., M Vavra, J.M. Boyd, M.A. Hemstrom, A.A. Ager, and B.K. Johnson. Understanding ungulate herbivory – episodic disturbance effects on vegetation dynamics: knowledge gaps and management needs. Wildlife Society Bulletin 34(2): 283-292.

WNSRT 2021 – White-Nose Syndrome Response Team. Accessed on July 8, 2024. Accessed online at: https://www.whitenosesyndrome.org/static-page/what-is-white-nose-syndrome

Woods 1973 – Woods, C.A. Mammalian Species: *Erethizon dorsatum*. The American Society of Mammalogists. No. 29: 6 pp.

WRCC 2007 – Western Regional Climate Center. Recent Climate in the West. Accessed July 9, 2024. Accessed online at: https://wrcc.dri.edu/

Xerces Society 2024a – Xerces Society. Pocket Guide to Identifying the Western Bumble Bee. 2nd ed. Accessed online at: https://www.xerces.org/sites/default/files/2018-05/12-017_02_XercesSoc_BumbleBeePocketID_Bombus-occidentalis_web.pdf

Xerces Society 2024b – Xerces Society. Species Profiles: Western Bumble Bee. Access on June 18, 2024. Accessed online at: https://xerces.org/endangered-species/species-profiles/at-risk-bumble-bees/western-bumble-bee

Xerces Society 2020 – Xerces Society. Xerces Society Blog - Forests, Fires, and Insects, dated December 2020. Accessed on May 17, 2024. Accessed online at: https://www.xerces.org/blog/forests-fires-and-insects

Xerces Society et al. 2018 – Xerxes Society, R. Hatfield, S. Jepsen, S. Foltz Jordan, M. Blackburn, and A. Code. A Petition to the State of California Fish and Game Commission. October 16.

Zabel et al. 1995 – Zabel, C.J., K. McKalvey, and J.P Ward, Jr. Influence of primary prey on home-range size and habitat-use patterns of northern spotted owls (*Strix occidentalis caurina*). Can. J. Zool. 73: 433-439.

Zhang et al. 2019 – Zhang, L., R.H. Beede, G. Banuelos, C.M. Wallis, and L. Ferguson. Dust interferes with pollen stigma interaction and fruit set in Pistachio *Pistacia vera* cv. Kerman. HortScience 54(11): 1967-1971.

Zielinski and Duncan 2004 – Zielinski, W.J. and N.P. Duncan. Diets of Sympatric Populations of American Martens (*Martes americana*) and Fishers (*Martes pennanti*) in California. Journal of Mammalogy 85(3): 470-477.

Zulla et al. 2022 – Zulla, C.J., H.A. Kramer, G.M. Jones, J.J. Keane, K.N. Roberts, B.P. Dotters, S. C. Sawyer, S.A. Whitmore, W.J. Berigan, K.G. Kelly, A.K. Wray, and M.Z. Peery. Large trees and forest heterogeneity facilitate prey capture by California Spotted Owls. Ornithological Applications 124: 1-14.

Zwolak and Foresman 2007 – Zwolak, R. and K.R. Foresman. Effects of a stand-replacing fire on small-mammal communities in montane forest. Can. J. Zool. 85: 815-822.

5.3 Climate Change and Greenhouse Gas Emissions

5.3.1 Environmental Setting

This section describes the environmental and regulatory setting and potential impacts to the environment caused by the proposed project greenhouse gas (GHG) emissions. Unlike emissions of criteria and toxic air pollutants, which have regional and localized impacts, GHG emissions relate to the broader impact of global climate change.

Existing Conditions

Global warming associated with the "greenhouse effect" is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the Earth's atmosphere. The principal GHGs that contribute to global warming and climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), black carbon, and fluorinated gases (F-gases) (hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors.

Each GHG has its own potency and effect upon the Earth's energy balance, expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of one (1.0). Specifically, the GWP is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given time relative to the emissions of 1 ton of CO_2. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time. The time usually used for GWPs is 100 years. The F-gases are sometimes called high-GWP gases because, for a given amount of mass, they trap substantially more heat than CO_2. The GWPs for these gases can be in the thousands or tens of thousands. The carbon dioxide equivalent (CO2e) mass emission rate for a source is obtained by multiplying the mass of each GHG by the assigned GWP for that compound and then adding the results of this product together to obtain a single, mass emission rate in terms of CO2e that represents the combined effects of the GHGs.

California Emissions Inventory

California is a contributor to global GHG emissions. The total gross California GHG emissions in 2021 were 381.3 million metric tons of CO_2-equivalent (MMTCO2e) (CARB 2023). The largest category of GHG emissions in California is transportation, followed by industrial activities and electricity generation in state and out of state.

In 2021, the total gross U.S. greenhouse gas emissions were 6,340.2 MMTCO2e, or 5,586.0 MMTCO2e after accounting for sequestration from the land sector (U.S. EPA 2024). Nationwide GHG emissions in 2021 rebounded from 2020 levels that were lower than 2019 because of a sharp decline due to the impacts of the coronavirus (COVID-19) pandemic on fossil fuel combustion, related to travel and economic activity (CARB 2023, U.S. EPA 2024).

Shasta County Emissions Inventory

Shasta County completed a baseline GHG emissions inventory for the year 2008 as a part of a regional climate action planning process. In 2008, the unincorporated areas of Shasta County generated approximately 3.13 million MTCO2e, with the stationary sources being the largest source of emissions at 73 percent of total emissions, followed by transportation (8 percent), energy consumption (7 percent), the forestry sector (5 percent), and the agriculture sector (4 percent). The off-road vehicle/recreation, solid waste, and water (including water and wastewater) sectors comprise the remainder (4 percent) of the 2008 inventory (Shasta County 2012a).

Decarbonization of California's Electricity Sector

The electricity sector in California has achieved substantial GHG emissions reductions through renewable and zero-carbon energy deployment. Moving forward, a clean, affordable, and reliable electricity grid will serve as a backbone to support deep decarbonization across California's economy. Decarbonizing the electricity sector is a crucial pillar of achieving carbon neutrality, and CARB anticipates that the role of electricity in powering the economy will continue to grow while electric loads increase (CARB 2022).

California continues to add zero-carbon energy resources and battery energy storage systems (BESSs) to replace fossil-fuel generation and support growing demand. Moving to zero-carbon resources and BESSs is critical to reducing GHG emissions and addressing the long-term impacts of climate change (CEC 2022). Renewable and zero-carbon sources of energy do not operate on-demand like traditional fossil fuel power plants. The growth of zero-carbon resources, especially solar resources, has shifted the reliability concerns from the peak hour (hour with the highest energy demand) to net peak hours (hours when energy demand minus wind and solar generation is largest). As solar capacity has grown in recent years, net peak has shifted to later in the day. Wind generation late in the day along with discharging from BESSs aids in meeting the shift to a later net peak (CEC 2022).

Peak demand times require dispatching generation plants with different fuels, and generation resources in the state are diverse. Wind and solar generation are part of the supply on most days. While the electricity sector is using less fossil fuel due to increasing amounts of renewables and BESSs, existing fossil-fuel natural gas-fired generation will continue to play a critical role in grid reliability until other clean, dispatchable alternatives can be deployed at scale. Presently, fossil-fuel natural gas-fired power plants provide about 75 percent of the flexible capacity for grid reliability. As more renewable power enters the system, other resources such as storage and demand-side management are essential to maintain reliability with high concentrations of renewables (CARB 2022).

Regulatory

Federal

U.S. EPA GHG Mandatory Reporting Program (40 CFR Part 98). This rule requires mandatory reporting of GHG emissions for industrial facilities and power plants that emit more than 25,000 MTCO2e per year. The reporting program (40 CFR Part 98.300, Subpart DD) applies to electric and transmission distribution equipment that use high GWP gases, including SF_6, for insulation of electrical equipment. Currently, there are no federal regulations limiting GHG emissions from the types of sources that would occur with the proposed project. Circuit breakers and gas insulated switches related to electric power transmission and distribution may be sources of GHG subject to reporting due to the leakage of SF_6.

State

California Global Warming Solutions Act of 2006. In 2006, the state Legislature passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32, Núñez, Chapter 488, Statutes of 2006), codified as Health and Safety Code, section 38500 and the following, which provided the initial framework for regulating GHG emissions in California. This law required CARB to design and implement GHG emissions limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. AB 32 also required CARB to implement a mandatory GHG emissions reporting program for major sources, which includes electricity generators, industrial facilities, fuel suppliers, and electricity importers.

CARB Scoping Plan. Part of the Legislature's direction to CARB under AB 32 was to develop a scoping plan that serves as a statewide planning document to coordinate the main strategies California will use to reduce GHG emissions that cause climate change. CARB approved the AB 32 Climate Change Scoping Plan (Scoping Plan) in 2008 and released updates in 2014, 2017, and 2022. The CARB's Scoping Plan includes a range of GHG emissions reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based compliance mechanisms, such as the cap-and-trade program. In December 2007, CARB set the statewide 2020 emissions limit, defined as reducing emissions to 1990 levels, at 427 MMTCO2e. The 2014 Scoping Plan adjusted the 1990 emissions estimate and the statewide 2020 emissions limit goal to 431 MMTCO2e (CARB 2014). The 2017 Scoping Plan (CARB 2017a) demonstrates the approach necessary to achieve California's 2030 target, which is to reduce GHG emissions 40 percent below 1990 levels to 260 MMTCO2e. On November 16, 2022, CARB published the 2022 Scoping Plan for Achieving Carbon Neutrality (CARB 2022), which lays out a path to achieve targets for carbon neutrality by 2045.

Mandatory Reporting of Greenhouse Gas Emissions. AB 32 also required CARB to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions (Health and Safety Code, section 38530). CARB's Regulation for the

Mandatory Reporting of Greenhouse Gas Emissions (Cal. Code Regs., tit. 17 §§95100 to 95163), which took effect January 2009, requires annual GHG emissions reporting from electric power entities, fuel suppliers, CO_2 suppliers, petroleum and natural gas system operators, and industrial facilities that emit at least 10,000 MTCO2e per year from stationary combustion and/or process sources. No specific reporting requirements apply to electric power generation from wind resources.

Cap-and-Trade Program. CARB's cap-and-trade program (Health and Saf. Code, § 38562; 17 Cal. Code Regs., §§95801 to 96022) took effect January 1, 2012. The cap-and-trade program establishes a declining limit on major sources of GHG emissions by sector throughout California, and it creates economic incentives for sources to invest in cleaner, more efficient technologies. The current version of the regulation, effective April 2019, established the increasingly stringent compliance obligations for years 2021 to 2030. The cap-and-trade program applies to covered entities that fall within certain source categories, including first deliverers of electricity (such as fossil fuel power plants) and electrical distribution utilities; in this case, the project would obtain electrical service from SVP. Covered entities in the cap-and-trade program, including SVP, must hold compliance instruments sufficient to cover their actual GHG emissions, as set and verified through the CARB's Mandatory Reporting regulation. For the electricity supplied to the project from the grid, SVP bears the GHG emissions compliance obligation under the cap-and-trade program for delivering electricity to the grid from its power plants and for making deliveries to end-users, such as the project, unless the project is otherwise a covered entity in the cap-and-trade program.

Executive Order B-30-15. On April 29, 2015, former Governor Brown issued Executive Order B-30-15, directing state agencies to implement measures to reduce GHG emissions 40 percent below their 1990 levels by 2030 and to make it possible to achieve the previously stated goal of an 80 percent GHG emissions reduction below 1990 GHG emissions by 2050 (CARB 2017a).

Statewide 2030 GHG Emissions Limit. On September 8, 2016, SB 32, codified as Health and Safety Code, section 38566, extended California's commitment to reduce GHG emissions by requiring the state to reduce statewide GHG emissions by 40 percent below 1990 levels by 2030 (CARB 2017a).

Renewable Energy Programs. In 2002, California initially established the Renewables Portfolio Standard (RPS) with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent by 2017. State energy agencies recommended accelerating that goal, and former Governor Schwarzenegger's Executive Order S-14-08 (November 2008) required California utilities to reach the 33 percent renewable electricity goal by 2020, consistent with the CARB's 2008 Scoping Plan. In April 2011, Senate Bill X1-2 (Simitian, Chapter 1, Statutes of 2011) of the First Extraordinary Session was signed into law. SB X1-2 expressly applied the 33 percent RPS by December 31, 2020, to all retail sellers of electricity and established renewable energy standards for interim years prior to 2020.

- Clean Energy and Pollution Reduction Act (Senate Bill 350, De León, Chapter 547, Statutes of 2015): Beginning in 2016, SB 350 took effect declaring it the intent of the Legislature to acknowledge Governor Brown's clean energy, clean air and greenhouse gas emissions reduction goals for 2030 and beyond. SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030.
- The 100 Percent Clean Energy Act of 2018 (Senate Bill 100, De León, Chapter 312, Statutes of 2018): Beginning in 2019, the RPS deadlines advanced to 50 percent renewable resources by December 31, 2026, and 60 percent by December 31, 2030. In addition, SB 100 establishes policy that renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity by December 31, 2045.
- Clean Energy, Jobs, and Affordability Act of 2022 (Senate Bill 1020, Laird, Chapter 361, Statutes of 2022): Accelerates the timelines set forth in SB 100 to provide that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified.

Short-Lived Climate Pollutant Strategy. To best support the reduction of GHG emissions consistent with AB 32, CARB released the Short-Lived Climate Pollutant (SLCP) Strategy, under Health and Safety Code, section 39730, in March 2017. Health and Safety Code, section 39730, defined SLCPs as having lifetimes in the atmosphere ranging from "a few days to a few decades." Then beginning in 2017 under Health and Safety Code, section 39730.5, CARB was directed to set targets to reduce SLCP emissions 40 percent below 2013 levels by 2030 for CH_4 and HFCs and 50 percent below 2013 levels by 2030 for anthropogenic black carbon (CARB 2017b). The SLCP Strategy was integrated into the 2017 update to CARB's Scoping Plan.

Executive Order B-55-18. On September 10, 2018, the same day he signed SB 100 into law, former Governor Brown issued Executive Order B-55-18 to achieve carbon neutrality, stating the governor's intention "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This goal is in addition to the existing statewide targets of reducing greenhouse gas emissions." From the 2020 GHG limit of 431 MMTCO2e, California will need to reduce statewide emissions another 170 million tons to meet its 2030 statutory target of 260 million tons per year (40 percent below 1990 levels). The state would need to cut annual emissions by a further 175 million tons to meet its 2050 goal (set by executive order) of 85 million tons per year (80 percent below 1990 levels).

Reducing SF_6 Emissions from Gas Insulated Switchgear. In early 2011, CARB adopted a regulation (17 CCR §§95350 to 95359) to reduce SF_6 emissions in gas insulated switchgear used in the electricity sector's transmission and distribution system

as an early action measure pursuant to AB 32. SF_6 is an extremely powerful and long-lived GHG. The 100-year GWP of SF_6 is 22,800 (from IPCC Fourth Assessment Report), making it the most potent of the six main GHGs, according to the U.S. EPA. Because of its extremely high GWP, small reductions in SF_6 emissions can have a large impact on reducing GHG emissions, which are the main drivers of climate change. The regulation requires gas insulated switchgear owners to report SF_6 emissions annually and requires reducing losses of SF_6 over time, subject to annual emission rate limits. The maximum allowable emission rate started at 10 percent in 2011 and has decreased one percent per year since then. The limit reached one percent in 2020 and remained at that level going forward. However, data show that statewide SF_6 capacity is growing by one to five percent per year, which would increase the expected SF_6 emissions. In response to emerging technologies using lower or zero GWP insulators, CARB amended the regulation (Cal. Code Regs., tit. 17, §§ 95350-95359.1) in 2021 to further reduce GHG emissions from gas-insulated equipment (GIE). Key provisions of the amended regulation include a phase-out schedule in stages between 2025 and 2033 for new SF_6 GIE, coverage of other GHG beyond SF_6 used in GIE, and other changes that enhance accuracy of emissions accounting and reporting.

The California Climate Crisis Act (Assembly Bill 1279). Assembly Bill 1279 (Muratsuchi, Chapter 337, Statutes of 2022) establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced at least 85 percent below 1990 levels. The bill requires CARB to ensure that Scoping Plan updates identify and recommend measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable CO_2 removal solutions and carbon capture, utilization, and storage (CCUS) technologies. The CARB 2022 Scoping Plan for Achieving Carbon Neutrality (CARB 2022c) plans for the 2045 target set forth by AB 1279 and Executive Order B-55-18.

California Environmental Quality Act (CEQA) Guidelines for GHG Emissions. With the enactment of Senate Bill 97 (Dutton, Chapter 185, Statutes of 2007), the Governor's Office of Planning and Research was required by July 1, 2009, to prepare, develop, and transmit to the Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Those amendments to the CEQA guidelines became effective March 18, 2010, and were subsequently updated in December 2018 to further address the analysis of GHG emissions, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects. (See CEQA Guidelines, § 15064.4, subd. (a))
- The focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. (See CEQA Guidelines, § 15064.4, subd. (b))

- The impacts analysis of GHG emissions is global in nature and thus should be considered in a broader context. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national, or global emissions. (See CEQA Guidelines, § 15064.4, subd. (b))
- Lead agencies should consider a timeframe for the analysis that is appropriate for the project. (See CEQA Guidelines, § 15064.4, subd. (b))
- A lead agency's analysis must reasonably reflect evolving scientific knowledge and state regulatory schemes. (See CEQA Guidelines, § 15064.4, subd. (b).)
- Lead agencies may rely on an adopted statewide, regional, or local plan in evaluating a project's GHG emissions. (See CEQA Guidelines, § 15064.4, subd. (b)(3))
- Lead agencies may analyze and mitigate the significant impact of GHG emissions as part of a larger plan for the reduction of greenhouse gases. (See CEQA Guidelines, §15183.5, sub. (a))
- A project's incremental contribution to a cumulative GHG emissions effect may be determined not to be significant and the effects of the project to not be cumulatively considerable if the project complies with the requirements of the GHG emissions reduction strategy. (See CEQA Guidelines, §§ 15064, sub. (h)(3); 15130, sub. (d); 15183, sub. (b))
- In determining the significance of a project's impacts, the lead agency may consider a project's consistency with the state's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is consistent with those plans, goals, or strategies. (See CEQA Guidelines, § 15064.4, subd. (b)(3))
- The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently account for the project's incremental contribution to climate change. (See CEQA Guidelines, § 15064.4, subd. (c).)

Local

Draft 2012 Shasta Regional Climate Action Plan (RCAP). Between 2010 and 2012, the Shasta County Air Quality Management District (AQMD) and members of the public and industry participated in the development of a Regional Climate Action Planning (RCAP). The Draft 2012 RCAP included emissions inventories and forecasts for the unincorporated areas of Shasta County and for the cities of Anderson, Redding, and Shasta Lake. Areas of consideration included building energy, transportation, solid waste, water consumption and wastewater treatment, off road vehicle operation, stationary industrial sources, agriculture, and forestry.

The Draft 2012 RCAP described GHG reduction measure to facilitate achieving a 2020 emissions reduction target with commitments to develop additional measures to

contribute to targets for 2035 and 2050. The Draft 2012 RCAP identified emissions reduction achieved through compliance with the State RPS goal of 33 percent renewable electricity by 2020 (Shasta County 2012a). The Air Pollution Control Officer presented the Draft 2012 RCAP to the Shasta County Air Pollution Control Board on September 25, 2012, and the Air Pollution Control Board adjourned without adopting the RCAP (Shasta County 2012b).

Regional Transportation Plan (RTP) & Sustainable Communities Strategy (SCS). The Shasta Regional Transportation Agency (SRTA) is the federally recognized metropolitan planning organization (MPO) for the Shasta County region. Pursuant to the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the SRTA developed the 2022 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region, which is pending approval by the SRTA Board of Directors. The 2022 RTP includes GHG emissions quantification for vehicle-miles traveled in the region to achieve GHG reduction targets for 2035 (SRTA 2023). The RTP/SCS lays out how the region will meet certain transportation-related GHG reduction targets while considering all economic segments of the population, net migration into the region, population growth, household formation, and employment growth. Between 2008 to 2023, the construction industry sector provided between 4,000 to 5,000 jobs in Shasta County (SRTA 2023).

Cumulative

The State CEQA Guidelines indicate that the impact analysis for GHG emissions is global in nature, and the focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. The discussion in "Existing Conditions" (subsection 5.3.1.1) discloses the broader context of global climate change and provides information on statewide and local emissions.

The Cumulative Project Scenario and a list of cumulative projects appears in **Appendix 1, Table 1-2**. Past, present, and reasonably foreseeable probable future GHG emissions could be attributable to each of the cumulative projects, especially those that involve construction activities or O&M activities that involve use of fossil fuels. Each of the projects in the cumulative project scenario could result in some level of contribution to global climate change, although the contribution of GHG emissions from each project would be minimized if the project is designed and built to be consistent with California's overall GHG reduction strategy, as described in the "Regulatory Setting" (subsection 5.3.1.2).

5.3.2 Environmental Impacts

CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, greenhouse gas emissions.

5.3.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

The applicant estimated GHG emissions for construction and operation using CalEEMod (version 2020.4) and spreadsheet tools. The applicant's estimates include GHG from the construction equipment, vendor and hauling truck trips, and worker vehicle trips, with helicopters separately itemized (FWPA TN 254767; Air Quality Tech Memo, March 1, 2024), based on the proposed project including 48 wind turbines, developed over 24 to 28 months with concurrent activities (FWPA TN 254794). The applicant's overall GHG summary also relied on estimates of the electricity intensity of the water supply required for construction and potential SF_6 leaks presented in the 2020 Draft EIR (FWPA TN 248288-12; Shasta County DEIR).

In this analysis, staff developed revised GHG emissions estimates for construction and operation of the proposed project using CalEEMod (version 2022.1.1). Using the newer version of CalEEMod allows minor updates for GHG estimates from construction equipment, vendor and hauling truck trips, and worker vehicle trips; emissions from helicopters are unchanged from the applicant's analysis. Staff uses the updated CalEEMod software to provide results for mobile sources, the emergency generator as a stationary source, and other uses of transportation fuels and energy (electricity) to provide landscaping, water supply, and solid waste disposal related to the operation and maintenance (O&M) building. Additional spreadsheet analysis quantifies the effects of land use conversion and indirect GHG emissions reductions due to the electricity produced from renewable energy.

Thresholds of Significance

Shasta County AQMD has not adopted a quantitative threshold for GHG emissions that could be used in the CEQA process (FWPA TN 248288-12; Shasta County DEIR). Without locally-relevant guidance, staff recommends a project-specific threshold for use in the Opt-in Certification program for non-fossil-fueled power plants. The proposed project would be a renewable energy project, designed to generate electricity exclusively from renewable resources. Because the proposed project would install a new wind energy generation facility, staff would consider any net additional emission of GHG to potentially have a significant impact on the environment. This means if the project does not result in any net additional emissions of GHG, including GHG emissions from employee transportation, then staff would consider the project GHG emissions to cause no significant impact on the environment.

5.3.2.2 Direct and Indirect Impacts

a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant. The proposed project would cause GHG emissions due to construction activities and during operation. Separate discussions appear for the different effects on GHG emissions: those caused by development activities, like construction and operations with maintenance and inspection; the effects of land use conversion; and indirect GHG emissions reductions due to the electricity produced from renewable energy.

Construction

Construction and eventual decommissioning activities would cause GHG emissions resulting from fossil-fuel combustion in the engines of construction equipment and the vehicles carrying construction materials and workers to and from the site. Diesel fuel or gasoline would be used in mobilizing the heavy-duty construction equipment, site development and preparation, facility construction, and roadway construction, and eventual decommissioning. Over the two-year duration of construction, total GHG emissions would amount to approximately 14,803 MTCO2e, including all equipment and vehicle use, including helicopters, for all on-site and off-site activity needed to install the proposed project (per staff analysis using CalEEMod); this also includes energy consumed to supply up to 310 acre-feet of water supplied to the site for dust control, soils compaction, and concrete manufacture (FWPA TN 254794; Project Description, March 4, 2024). To capture the long-term effects of the one-time, short-term construction GHG emissions, this analysis averages the construction effects over a 30-year life of the project. On this basis, the overall construction GHG emissions amortized over 30 years would be equivalent to an annualized rate of 493 MTCO2e/year.

Operation

Operation of the proposed project would cause GHG emissions from the following types of activities: worker motor vehicle trips; emergency generator testing; energy use (electricity) for the O&M building; cranes used to access turbines for maintenance work; mowers used for maintenance; the electricity intensity of the O&M water supply; solid waste disposal; and SF_6 leaked from circuit breakers at the proposed substation site.

Table 5.3-1 summarizes the total construction GHG emissions with the different project effects of the O&M activities, including the sources of the emergency generator and fugitive losses of SF_6; the table also includes the effects of land use conversion and indirect GHG emissions reductions due to the electricity produced from wind power as renewable energy.

TABLE 5.3-1 PROJECT GHG EMISSIONS, CONSTRUCTION AND OPERATION

Emission Source	Annual Emissions (MTCO2e/year)
O&M Vehicle Trips	204
Emergency Generator Testing	3
O&M Building Electricity Use and Solid Waste	23
O&M Cranes and Mowers	149
O&M Area Sources, Water Use, Solid Waste	6
Fugitive SF_6 Emissions	52
Effects of Land Use Conversion	2,391
Total Operation	**2,828**
Construction Emissions	14,803 (duration of Construction)
One-time Construction, if amortized over 30-year project life	493
Combined Effects of Operation and Construction	**3,322**
Emissions Avoided by Producing Electricity	-214,000
Total Net Emissions	**-210,678**

Source: Construction and O&M emissions sources from applicant activity (FWPA TN 254794, TN 254767, and TN 254771) and staff analysis using CalEEMod (version 2022.1.1); with staff estimates for effects of land use conversion and emissions avoided by producing electricity.

Vehicle Trips, Emergency Generator, and O&M Building and Equipment. Proposed project operations with maintenance and inspection of the wind energy generation facility would use diesel fuel and gasoline for off-site vehicle trips for worker commutes, material deliveries, site security, and facility upkeep. Use of these fuels would cause GHG emissions from the vehicle trips, and GHG emissions would occur from occasional propane fuel combustion by the emergency generator. Other onsite GHG emissions would be caused by mobile cranes and landscaping, water supply, and solid waste disposal related to O&M building use and occupancy. For the vehicle trips and proposed project workforce of up to 10 full-time employees, emergency generator, the O&M building (7,000 square-feet), other equipment and water supply, the emissions would be approximately 385 MTCO2e per year.

Fugitive SF_6 Emissions from Gas-Insulated Equipment. The proposed project would add new stationary sources of GHG with electrical power equipment that contains gas to provide thermal insulation or arc quenching. This gas-insulated equipment includes devices such as switchgear, switches, and circuit breakers within the proposed substation. Until an alternative insulating gas becomes commercially available, circuit breakers and gas-insulated switchgear would contain SF_6, a potent GHG. The SF_6 insulating gas could be expected to leak at small amounts annually over the life of the project. Federal and state-level mandatory reporting rules track SF_6 emissions, and the CARB Regulation for Reducing Greenhouse Gas Emissions from Gas-Insulated Equipment requires control and eventual replacement and phase-out of SF_6 with alternative gases having lower GWP. Accordingly, the project would need to manage its use of SF_6 through inventory recordkeeping, proper handling, and planning for an eventual replacement with an alternative. Prior to the phase-out, emissions of SF_6 due to potential leaks are quantified as approximately 52 MTCO2e per year, and these GHG emissions are included in the sum of other emissions due to operations (FWPA TN 248288-12).

Loss of Carbon Sequestration by Land Use Conversion. The applicant estimated the potential loss of carbon sequestration capacity from tree removal as an effect of the land being converted from existing conditions to develop the proposed project. The applicant used CalEEMod forestland carbon biogenic emissions factors to estimate the potential one-time loss of sequestration capacity. The applicant selected a CalEEMod factor in lieu of other methodologies to estimate carbon sequestration and carbon release from soils, recognizing that developing project-specific factors may require on-site plot sampling to determine actual on-site carbon inventories; the applicant assumed that the amount of released CO_2 from the soil due to the removal of trees could equal the amount of carbon sequestration loss due to the removal of trees (FWPA TN 248289-1; Shasta County FEIR). The CalEEMod values for forestland are generalized. In this analysis, staff updates the quantification of this project effect using separate annual net carbon exchange factors for live vegetation and soil within the “Forest / Sierra-Cascades" land cover type, as defined in technical documentation for the California Natural and Working Lands (CALAND) Carbon and Greenhouse Gas Model (Di Vittorio and Simmonds 2019). For the proposed project, with a permanent impact of approximately 510 acres disturbed (FWPA TN 254794), the rate of lost carbon exchange would equal 2,391 MTCO2e per year.

Emissions Avoided by Producing Electricity. Some of the renewable power generated by the proposed project would displace power produced by carbon-based fuels that would otherwise be used to meet electricity demand. The power displaced is incremental power provided by generators elsewhere on the grid, typically from natural gas power plants.

The proposed wind energy generation facility, with a nameplate capacity of up to 205 MW (FWPA TN 254794), would be able to produce up to 574,000 megawatt-hours (MWh) of electricity each year based on an annual average capacity factor of 32

percent (FWPA TN 248288-9). Some of the electricity produced would displace fuel-burning by California's flexible natural gas-fired resources or electricity otherwise imported to California. This would avoid GHG that could otherwise be emitted by fuel-burning generators. The rate of GHG emissions avoided would vary with the mix of generators and imported electricity displaced by the incremental supply generated by the proposed project. The least efficient and highest-emitting generators are normally turned down to accommodate additional renewable generation; in California, there is a single dominant dispatchable fuel (natural gas) (CEC 2019; CPUC 2022).

To estimate the emissions avoided by wind energy produced by the project, this analysis assumes that the proposed wind energy generating facility would avoid the need to use fuel at a mix of flexible, dispatchable generating facilities. Because natural gas provides most of the flexible capacity, this analysis uses an avoided emissions displacement factor of approximately 0.373 MT of CO_2 per MWh (822.5 lb per MWh), which is a conservatively low emission factor for efficient, conventional generation using natural gas, combined cycle generators (CEC 2019). While the precise quantity of GHG emissions avoided by the proposed project would depend on the operations, the project would result in the avoidance of over 214,000 MTCO2e per year.

Overall Direct and Indirect GHG Emissions Effects. The summary of **Table 5.3-1** demonstrates that the proposed project would not result in any net additional GHG emissions. The combined direct and indirect effects of the emissions quantified indicate that a net GHG reduction would occur primarily due to the emissions avoided by producing electricity from renewable energy. This impact would be less than significant, and no mitigation is required.

b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Construction

Less Than Significant. The project's short-term construction GHG emissions would not interfere with the state's ability to achieve long-term GHG emissions reduction goals. Construction vehicles and the supplies of transportation fuels used during construction of the project are required to comply with the applicable GHG reduction programs for mobile sources and suppliers of transportation fuels. Construction activities of the project would conform to relevant programs and recommended actions detailed in CARB's Scoping Plan.

Operation

Less Than Significant. The primary effect of the proposed project on GHG emissions would be the ability to produce electricity from renewable resources, which improves the supply of renewable energy to end-use customers and facilitates achieving statewide renewable energy goals. Electricity from the wind energy generation facility

would be used to serve the needs of California's customers and would facilitate compliance with California's Renewables Portfolio Standard (RPS).

Other project GHG emissions due to operational activities would be subject to energy efficiency requirements and GHG reduction programs for mobile sources and suppliers of transportation fuels. For example, emissions from the operational workforce and from O&M activity and building use would be similar to those of other industrial development. The proposed project would comply with all applicable city and state green building standards measures, including California Code of Regulations, Title 24, Part 6, baseline standard requirements for energy efficiency, based on the 2019 Energy Efficiency Standards requirements, and the 2019 California Green Building Standards Code, commonly referred to as CALGreen (California Code of Regulations, Title 24, Part 11).

Achieving the renewable energy targets mandated by the RPS is critical to California achieving its GHG targets and statewide carbon neutrality as established by the California Climate Crisis Act of 2022 (AB 1279). The CARB 2022 Climate Change Scoping Plan identifies decarbonizing the electricity sector as a crucial pillar of achieving carbon neutrality (CARB 2022). The California Global Warming Solutions Act of 2006 (AB 32) and Senate Bill 32 (SB 32) of 2016 codified the GHG emissions target to 40 percent below the 1990 level by 2030. Subsequently, California's Clean Energy and Pollution Reduction Act of 2015 [Senate Bill 350 (SB 350)], SB 350 set ambitious 2030 targets for energy efficiency and renewable electricity, among other actions aimed at reducing GHG emissions across the energy and transportation sectors. SB 350 also connects long-term planning for electricity needs with the state's climate targets, with ARB establishing 2030 GHG emissions targets for the electricity sector in general (CARB 2022). The current RPS was signed into law in September 2018 with Senate Bill 100 (SB 100), which established the goals of 50 percent renewable energy resources by 2026 and 60 percent renewable energy resources by 2030. SB 100 also sets a target for California to achieve a GHG-free energy supply by December 31, 2045.

The strategy for achieving the GHG reductions is set forth by the CARB's Scoping Plan. Overall, the electricity produced by the project would contribute to continuing GHG reductions in California's power supply. Because the project would use renewable energy resources to produce electricity, the avoided GHG emissions would be consistent with and would not conflict with the California's GHG emissions reduction targets and the CARB's Scoping Plan that relies on achieving the RPS targets.

The GHG emissions quantification illustrates that emissions generated during construction and O&M would be considerably less than the quantity of avoided GHG emissions, and that the proposed wind energy generation facility would lead to a net reduction in GHG emissions across the State's electricity system. The proposed project would contribute to meeting the State's GHG reduction goals under AB 32, and subsequent targets for 2030 and beyond, and would facilitate compliance with California's RPS. The proposed project would comply with all regulations or requirements adopted to implement a statewide, regional, or local plan for the

reduction or mitigation of GHG emissions, and the proposed project would not conflict with any applicable GHG management plan, policy, or regulation. This impact would be less than significant, and no mitigation is required.

5.3.2.3 Cumulative Impacts

The impact analysis for GHG emissions is global in nature, and the project's GHG emissions are considered in the broad context of global climate change. The focus of this analysis is to disclose the project's effect on climate change, while presenting the quantity of GHG emissions. The State CEQA Guidelines provide that a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be significant and the effects of the project to not be cumulatively considerable if the project complies with the requirements of the state's long-term climate goals or strategies.

The proposed wind energy generation facility would lead to a net reduction in GHG emissions across the State's electricity system, and the GHG emissions related to the project would not conflict with any plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs. Therefore, the project's GHG emissions would not be cumulatively considerable.

5.3.3 Project Conformance with Applicable LORS

Table 5.3-2 includes staff's determination of conformance with applicable local, state and federal LORS. As shown in this table, staff concludes that the proposed project would be consistent with all applicable LORS.

TABLE 5.3-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Federal	
Mandatory Reporting (40 CFR Part 98)	**Not applicable.** Project would not emit more than 25,000 MTCO2e per year.
State	
Scoping Plan	**Yes.** The proposed wind energy generation facility would provide electricity to facilitate compliance with California's RPS and would lead to a net reduction in GHG emissions across the State's electricity system.
CARB Mandatory Reporting	**Not applicable.** Project would not generate electricity using fossil fuels.
CARB Cap-and-Trade Program	**Not applicable.** Project would not emit GHG in quantities that could trigger cap-and-trade program applicability.
CARB SF_6 Reduction Requirements	**Yes.** The project would comply with GHG emissions reduction requirements through conformance with reporting and phase-out requirements of this regulation.
Local	

TABLE 5.3-2 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
Draft 2012 Shasta Regional Climate Action Plan	**Not applicable.** The Draft 2012 RCAP is not an adopted plan. Project would achieve GHG emissions reductions by facilitating progress towards the State RPS goals.
Shasta Regional Transportation Agency, RTP/SCS	**Yes.** The 2023 RTP/SCS forecasts growth in population and employment in the region estimates that employment while achieving GHG reductions per capita (SRTA 2023). Construction workers and O&M full-time employees would represent additional temporary and up to 10 full-time permanent jobs within the RTP/SCS growth projections.

5.3.4 Conclusions and Recommendations

As discussed above, the project would have a less than significant impact related to climate change and GHG emissions and would conform with applicable LORS.

5.3.5 Proposed Conditions of Certification

There are no proposed conditions of certification for climate change and GHG emissions.

5.3.6 References

CARB 2014 – California Air Resources Board (CARB). First Update to the Climate Change Scoping Plan. May. Accessed on January 12, 2024. Accessed online at: https://ww3.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf

CARB 2017a – California Air Resources Board (CARB). 2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target. November. 2017. Accessed on January 12, 2024. Accessed online at: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf

CARB 2017b – California Air Resources Board (CARB). Short-Lived Climate Pollutant Reduction Strategy. March. Accessed on January 12, 2024. Accessed online at: https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf

CARB 2022 – California Air Resources Board (CARB). 2022 Scoping Plan for Achieving Carbon Neutrality. December. Accessed on January 12, 2024. Accessed online at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

CARB 2023 – California Air Resources Board (CARB). California Greenhouse Gas Inventory for 2000-2021 — by Category as Defined in the 2008 Scoping Plan. December. Accessed on January 12, 2024. Accessed online at: https://ww2.arb.ca.gov/sites/default/files/2023-12/ghg_inventory_scopingplan_sum_2000-21.pdf

CEC 2019 – California Energy Commission (CEC). Staff Report. "Estimated Cost of New Utility-Scale Generation in California: 2018 Update." CEC-200-2019-500. May. Accessed on: January 12, 2024. Accessed online at: https://www.energy.ca.gov/sites/default/files/2021-06/CEC-200-2019-005.pdf

CEC 2022 – California Energy Commission (CEC). Final 2021 Integrated Energy Policy Report (IEPR), Volume II - Ensuring Reliability in a Changing Climate. February. Accessed on: January 12, 2024. Accessed online at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=241583

CPUC 2022 – California Public Utilities Commission (CPUC). Greenhouse Gas and Criteria Pollutant Accounting Methodology for use in Load-Serving Entity Portfolio Development in 2022 Integrated Resource Plans. July. Accessed on: January 12, 2024. Accessed online at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2022-irp-cycle-events-and-materials/clean-system-power-calculator-documentation.pdf

Di Vittorio and Simmonds 2019 – Di Vittorio, A., and M. Simmonds. California Natural and Working Lands Carbon and Greenhouse Gas Model (CALAND), Version 3, Technical Documentation. Accessed on January 23, 2024. Accessed online at: https://resources.ca.gov/CNRALegacyFiles/wp-content/uploads/2019/06/caland_technical_documentation_v3_june2019.pdf

FWPA TN 248288-12 – Fountain Wind Project Application (TN 248288-1 through TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA TN 248289-1 – Fountain Wind Project Application (TN 248289-1 through TN 248289-3). Shasta County FEIR Vol.1, Vol.2, Appendices Part 3. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2012a – Shasta County Air Quality Management District (AQMD). Draft Shasta Regional Climate Action Plan (RCAP). November 2012. Presented to the Air Pollution Control Board on September 25, 2012. Accessed on: January 9, 2024. Accessed online at: https://web.archive.org/web/20140401035355/http:/www.co.shasta.ca.us/index/drm_index/aq_index/programs/RCAP/Draft_RCAP.aspx.

Shasta County 2012b – Shasta County Air Pollution Control Board (APCB). Regular Meeting Minutes for September 25, 2012. Accessed on: January 9, 2024. Accessed online at: https://web.archive.org/web/20150906212516/http://www.co.shasta.ca.us/docs/Resource_Management/aq-minutes/APCBminutes-092512.pdf?sfvrsn=0

SRTA 2023 – Shasta Regional Transportation Agency (SRTA). 2022 Regional Transportation Plan and Sustainable Communities Strategy for the Shasta Region. Proposed for Adoption December 14, 2023. Accessed on: January 23, 2024. Accessed online at:

https://www.srta.ca.gov/DocumentCenter/View/9214/2022-Regional-Transportation-Plan--Sustainable-Communities-Strategy

U.S. EPA 2024 – U.S. Environmental Protection Agency (U.S. EPA). Inventory of U.S. Greenhouse Gas Emissions and Sinks. Accessed on: January 16, 2024. Accessed online at: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

5.4 Cultural and Cultural Tribal Resources

5.4.1 Environmental Setting

This section assesses the potential impacts of the proposed project on cultural and tribal cultural resources. As described in detail, CEC staff concludes that the project area is highly sensitive for archaeological and tribal cultural resources.

The section considers four broad classes of cultural resources: prehistoric, ethnographic, historic-period, and tribal cultural resources. The next four paragraphs briefly describe these classes of resources along with the definitions of Survey Area, Project Site, and Study Area. Afterward, the Cultural and Tribal Cultural Resources section presents the environmental setting pertinent to these resources including:

- *Prehistoric, ethnographic, and historic contexts* - generally describes who lived in the project vicinity, the timing of their occupation, and what uses they made of the area;
- *Methods of analysis* - establishes what kinds of physical traces (cultural and tribal cultural resources) past peoples might have left in the Project Site, given the project vicinity's prehistoric, ethnographic, and historic contexts.
- *Results* - ensuing from those methods - identifies the specific resources present or expectable in the Project Site.
- *Regulatory setting* - presents the criteria for identifying *significant* cultural and tribal cultural resources under the California Environmental Quality Act (CEQA) and other applicable authorities, as well as criteria for identifying significant impacts on these resources.
- *Impacts* - identifies any impacts on cultural and tribal cultural resources, along with the severity of any such impacts.
- *Mitigation measures* - measures proposed to avoid, minimize, rectify, reduce or eliminate, or compensate for identified impacts.

Prehistoric archaeological resources are those materials relating to Native American occupation and use of a particular environment. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American activity. In California, the prehistoric period began more than 12,000 years ago and extended through the eighteenth century until 1769 Common Era (C.E.), when Europeans began colonizing California.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, value-imbued landscapes, cemeteries, shrines, or neighborhoods and structures. Ethnographic resources are variations of natural resources and standard

cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their lifeways.

Historic-period resources are those materials, archaeological and architectural, usually but not necessarily associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, trail and road corridors, artifacts, or other evidence of historic human activity. Under federal and state requirements, historic period cultural resources must be 50 years or older to be considered of potential historic importance. A resource less than 50 years of age may be historically significant if the resource is of exceptional importance. The Office of Historic Preservation (OHP 1995, page 2) endorses recording and evaluating resources 45 years or older to accommodate a five-year lag in the planning process.

Tribal cultural resources are a category of historical resources introduced into CEQA by Assembly Bill 52 (Stats. 2014). Tribal cultural resources are resources that are any of the following: sites, features, places, cultural landscapes, sacred places, or objects that are included in or determined eligible to the California Register of Historical Resources (CRHR) or are included on a local register of historical resources as defined in Public Resources Code, section 5020.1(k). Tribal cultural resources can be prehistoric, ethnographic, or historic.

Two overarching cultural documents, the revised Stantec May 19, 2023, Fountain Wind Energy Project Cultural Resources Phase 1 Inventory of 4,463 Acres, Shasta County, California (FWPA, TN 250825), and the Stantec June 16, 2023, Fountain Wind Energy Project Historical Resources Evaluation Report (FWPA, TN 250742), were reviewed and referenced as part of this analysis.

Existing Conditions

The cultural chronologies discussed below are not specific to the Montgomery Creek area, but are regional based, due to the lack of available archaeological excavation data within the project vicinity. Future archaeological research around Montgomery Creek would use these regional based chronologies for hypothesis testing. In the absence of available archaeological excavation data, chronologies from the broader northeastern California region, developed outside of the Montgomery Creek area, are relied upon.

Precontact Archaeological Context

The proposed project is largely removed from locations where truly intensive archaeological research has taken place. Previous systematic and intensive archaeological investigations in the region of the proposed project were primarily conducted in response to proposed reservoir developments and highway construction

projects. For example, in the late 1950s and early 1960s, programs of archaeological survey and salvage excavation were initiated in response to the construction of Shasta, Whiskeytown, and Trinity reservoirs. Most of this work was conducted by San Francisco State College under the direction of Adan Treganza. Other early archaeological work in the region was also conducted in advance of reservoir projects. These projects included work at the Black Butte Reservoir; Red Bank Creek, Tehama-Colusa Canal, proposed Paskenta-Newville Reservoir, and proposed Dutch Gulch Reservoir. In the 1970s, archaeological survey and excavation work continued in the area with investigations along Thomes Creek and surveys for the Tehama and Dutch Gulch reservoirs. Indeed, archaeological work related to reservoir construction continued into the 1980s, with investigations for the Thomes-Newville Reservoir and a succession of projects at Black Butte, Dutch Gulch, and Tehama reservoirs conducted by California State University, Sacramento, under the direction of Jerald Johnson (FWPA, TN 250825, pages 8–9).

The last two decades of regional archaeological investigations witnessed the development of classification schemes that attempted to place assemblages of cultural material in specific temporal and spatial contexts. Many of these schemes also attempt to associate artifact assemblages with specific groups and/or settlement/subsistence strategies. Progress, however, in refining the basic chronology of the region, including the initial and terminal dates of specific artifact classes and types, such as projectile points and ground stone, has been slow. The process has tended to be slow because many artifact type names (e.g., Desert side-notched and Gunther-barbed projectile points) and their associated chronologies used in the region have wide geographic distributions. This situation has impeded intra- and inter-regional comparisons of artifact types and assemblages and the development of chronological sequences specific to the region. Regardless, several individuals have presented cultural sequences for the region (FWPA, TN 250825, page 9).

In 1970, Robert L. Edwards developed a three-phase cultural chronology for the region. His chronology begins with initial occupation of the region that is identified by assemblages primarily consisting of millingstones and locally available stone tool materials (i.e., basalt and chert). The subsequent phase, which Edwards dates to 1000 Common Era (C.E.), is the Tehama Phase. This phase appears to represent an increased reliance on acorns, as evidenced by the presence of mortars and pestles in the artifact assemblage typically associated with it. The final phase of Edwards' chronology is the late prehistoric Shasta Complex. The Shasta Complex was poorly represented in his data, so Edwards based it on archaeological data from the Shasta Dam area. Regardless, subsequent excavations have expanded our understanding of the Shasta Complex (FWPA, TN 250825, page 9).

Sundahl's work on the Shasta Complex represents the first comprehensive attempt to explain the origin, development, and distribution of the complex. Sundahl divided the Shasta Complex into three temporal phases based on the presence and absence of various assemblage attributes. The earliest phase dates from 1250 to 750 Before Present (B.P., or 1950 C.E.); the second phase from 750 to 350 B.P.; and the final

phase from 350 to 100 B.P. Sundahl concluded, based on an analysis of data from excavated sites in the Redding area and linguistic data collected by Whistler, that sites containing all the assemblage attributes associated with the Shasta Complex were restricted to ethnographic Wintu territory. Sundahl also suggested that the Shasta Complex most likely represents the Wintu migration into the upper Sacramento Valley. Clewett and Sundahl expanded this hypothesis and suggest a cultural distinction between permanent, riverine villages of the Wintu west of the Sacramento River represented by Shasta Complex sites and contemporaneous seasonally occupied sites of the mobile ethnographic Yana along the east banks of the Sacramento River and eastern foothills of the Sacramento Valley represented by the Tehama Pattern. Differences in milling equipment were one of the characteristics used to distinguish the Shasta Complex, with its emphasis on mortars and pestles and absence of manos and millingstones, from the Tehama Pattern, which relied on manos and millingstones, with an absence of mortars and pestles. Sundahl conducted additional archaeological investigations in the area and presented a synthesis of northern California prehistory that identifies five generalized cultural patterns spanning 8,000 years. Sundahl's five patterns are the Borax Lake, Squaw Creek, Whiskeytown, Tehama, and Augustine (Redding Aspect) patterns (FWPA, TN 250825, pages 9–10), which are briefly described below.

Borax Lake Pattern ca. 8000–5000 B.P. The earliest occupations are represented by only a few components, usually affiliated with the Borax Lake Pattern, dating to circa 5000–8000 B.P. Assemblages include wide-stemmed points, handstones, milling slabs, and ovoid flake tools. Borax Lake sites are found in a variety of environmental zones, including upland forested areas that probably represent short-term residential base camps. This early component is well represented at CA-SHA-000475 and CA-SHA-000499 in the Squaw Creek drainage, located in the Klamath Mountains northeast of Redding. The appearance of the Borax Lake Pattern in northern California is attributed to Hokan speaking peoples entering the area (FWPA, TN 250825, page 10).

Squaw Creek Pattern, ca. 3000–5000 B.P. This pattern appears to represent more intensive occupation of the southern Cascade region than the previous period. Upland forest sites are typical of this period, and artifact assemblages appear to reflect a mobile forager subsistence and settlement strategy. Sites associated with the Squaw Creek Pattern are found in the Sacramento River Canyon (e.g., the Pollard Flat Site), near Squaw Creek, and in the Clikapudi and Pit River drainages. Artifact assemblages associated with this pattern include Squaw Creek contracting-stemmed points; leaf-shaped points; McKee unifaces; cobble spalls; millingstones and well-shaped handstones; and mortars and pestles. Johnson and others suggest that the Squaw Creek Pattern may reflect the migration of ancestral Yokuts and Miwok into the southern Cascades (FWPA, TN 250825, page 10).

The Whiskeytown Pattern, ca. 1700–3000 B.P. This pattern appears to represent a shift in settlement and subsistence strategies in the Redding area. Artifact assemblages include relatively small to large side and corner-notched points such as

Northern side-notched, Elko Series, Clikapudi Series, and Whiskeytown side-notched; millingstones and manos; mortars and pestles; and notched-pebbles that appear to be net weights for fishing. The Whiskeytown Pattern suggests an intensification of the exploitation of riverine resources while still employing a pattern of transhumance (i.e., moving between the valley and forested upland areas). Basgall and Hildebrandt and Sundahl identified sites associated with the Squaw Creek and Whiskeytown patterns that appear to overlap in terms of their periods of use, suggesting that the two patterns may represent two different groups exploiting the same territory at the same time. Regardless, the Whiskeytown Pattern has been identified in the Squaw Creek area, Clikapudi Drainage, Sacramento River Canyon, and Redding area (FWPA, TN 250825, page 10).

The Tehama Pattern, ca. 1700–750 B.P. This pattern appears to be associated with the appearance of the bow and arrow in the region. Artifact assemblages include Gunther Series and small to medium side- and corner-notched projectile points, hopper mortars and pestles, manos and millingstones, and net weights. The Tehama Pattern is thought to reflect a mobile settlement-subsistence strategy, like the patterns used by Hokan-speaking groups (i.e., Yana) that exploited multiple environments (FWPA, TN 250825, page 10).

Shasta Complex (Augustine Pattern, Redding Aspect) ca. 1250–100 B.P. This pattern is associated with the prehistoric Wintu. Artifact assemblages include Gunther Series projectile points, hopper mortars and pestles, and bone fishing implements. The Augustine Pattern is highlighted by the establishment of permanent villages along the banks of rivers and a subsistence pattern that is orientated toward riverine resources and acorn processing (FWPA, TN 250825, page 10).

Other researchers have proposed slightly different cultural chronologies. For example, Basgall and Hildebrandt propose another cultural chronology for the northern Sacramento River Canyon. They conducted the first archaeological study in the region that cross-dated projectile point types, obsidian hydration data, radiocarbon assays, and dendrochronology. Basgall and Hildebrandt used these data sets to establish a three-phase chronology for the Sacramento River Canyon. The three phases are the Pollard Flat Phase (2700–5300 B.P.), which is characterized by Squaw Creek Contracting Stem, Pollard Diamond-shaped, and McKee series projectile points, and formal groundstone tools that have been shaped or slightly shaped, battered stones, anvils, mauls and net weights; Vollmers Phase (1700–4500 B.P.), which is characterized by medium size Clikapudi corner-notch and side-notch points, informal groundstone tools and indeterminate fragments, battered stones, anvils, mauls, and net weights; and Mosquito Creek Phase (1900 B.P. to historic contact), which is characterized by Gunther series points, the appearance of Desert Side-notched points in the late phase, groundstone dominated by expedient, indeterminate fragments, and an absence of shaped tools such as handstones, millingstones, hammerstones, anvils, mauls and net weights (FWPA, TN 250825, pages 10–11).

Additionally, a cultural chronology developed by Cleland for the Lake Britton area also provides an archaeological context for the project vicinity. Cleland's chronology is divided into six periods spanning 7,000 years, and primarily reflects broad stratigraphic time sequences rather than phases of cultural development. (FWPA, TN 250825, page 11.) The six periods include Paleo-Indian (prior to 7500 B.P.), Early Archaic-A (5000–7500 B.P.), Early Archaic-B (3900–5000 B.P.), Middle Archaic-A (3000–3900 B.P.), Middle Archaic-B (2000–3000 B.P.), Late Archaic (1000–2000 B.P.), and Emergent (150–1000 B.P.).

Archaeological research at the northern end of the Sacramento Valley and in the Sacramento River Canyon have generated a number of classification schemes that attempt to place archaeological assemblages consisting of specific types of artifacts within limited temporal and spatial contexts, and to associate them with specific strategies of resource exploitation and/or archaeological cultural groups. Refinement of these schemes, however, has been slow and a cultural chronology that addresses and integrates various regional chronological schemes and the initial and terminal dates for specific artifact types, such as projectile points and ground stone, has not been finalized for the region. In addition, artifact dating in the region has tended to rely on borrowing temporal assignments from existing chronologies in other regions for similar artifact types (e.g., Desert side-notched and Gunther-barbed projectile points) that may have broad geographic distributions (FWPA, TN 250825, page 12).

In summary, archaeological research in the northern Sacramento Valley and the surrounding area has provided cultural chronologies for the area and other information regarding its use and occupation by Native American populations, but questions persist regarding the chronologies, patterns of prehistoric settlement, and subsistence in the region. Ongoing archaeological research in the region is addressing these issues, particularly population movement and use of geographic areas by specific ethnolinguistic groups of Native Americans (FWPA, TN 250825, page 12).

Ethnographic Context

Prior to the arrival of Euroamericans in the region, California was inhabited by groups of Native Americans speaking more than 100 different languages and occupying a variety of ecological settings. The project location is within or near the ethnographic territory of the Achumawi and Atsugewi (or Pit River Indians), and Northern Yana (Johnson 1978). Indeed, ethnographic and historic records indicate that there were villages associated with these groups in the general vicinity of and/or within the proposed project (FWPA, TN 250825, page 12).

The Pit River Indians (Achumawi and Atsugewi) are associated with a large area of northeastern California (McGuire 2007, page 168). The Pit River Indians inhabited areas of Shasta County from southern Goose Lake in the north to Eagle Lake in the south, and from the Warner Range in the east to Mount Shasta in the west, including a large segment of the drainage of the mountainous Pit River (FWPA, TN 250825, page 12; McGuire 2007, page 168). More specifically, their territory is defined as a 100-mile

square specifically including, but not limited to, the XL Ranch, Montgomery Creek, Roaring Creek, Big Bend, Burney, Lookout, and Likely Rancherias, the 13 acres deeded to the United States by the State of California in trust for the Pit River Home and Agricultural Cooperative Association as trustee for the Tribe, Modoc County Assessor's parcels 013-172-07 and 013-191-01, and any other property that hereafter may be acquired by or for the tribe (Constitution of the Pit River Tribe, 2005). The Achumawi and Atsugewi languages are part of the Hokan linguistic stock, with each language containing dialects that correlates to the band divisions (McGuire 2007, page 168). Achumawi comprise several bands that function as autonomous political units (FWPA, TN 250825, page 12).

The Atsugewi have traditionally inhabited the territory adjacent to the southern boundary of the Achumawi on the north and extending to Mount Lassen on the south. The village was the basic autonomous political unit of the Atsugewi (FWPA, TN 250825, page 12).

The Yana people traditionally inhabited the Upper Sacramento River Valley and foothills east of the river (Johnson 1978, page 361). On the east, Yana territory encompasses the upper Deer Creek drainage through the upper Battle, Cow, and Montgomery Creek drainages (Johnson 1978, page 361). The Yana language belongs to the Yana Language Family of the Hokan Stock (Shipley 1978, page 89). Yana comprise several bands that function as autonomous political units (Johnson 1978, page 364). Much of what is known about Yana culture was provided by Ishi, a Yahi Yana who was brought to the University of California in 1911 after his family group died and he was left alone to survive (FWPA, TN 250825, pages 12–13).

Technology and subsistence strategies of the Achumawi, Atsugewi, and Yana are relatively similar. However, subsistence strategies (i.e., use of various plants and animals) do vary among the three groups because of access to different plant and animal habitats in their individual territories. The Achumawi, Atsugewi, and Yana remain active in their communities and retain strong interests in the management and protection of their heritage and natural resources in the area encompassing the proposed project (FWPA, TN 250825, page 13).

California Historic Context

Post-Contact history of California is divided into three major periods: the Spanish period (1769–1821), the Mexican period (1822–1848), and the American period (1848–present).

Spanish Period (1769–1821)

The Spanish period in California spans the years from 1769 to 1821 beginning with the founding of the first mission in California, the Mission San Diego de Alcala in 1769. However, the missions were located close to the coast, and the Native American inhabitants of the proposed project had no significant known contact with the Spanish.

The earliest known European exploration of the Sacramento Valley was in 1808 by Gabriel Moraga and soldiers from Mission San Jose, who were scouting for additional mission locations. Luis Arguello led similar expeditions in 1817 and 1821, likely reaching the location of present-day Sacramento (Mengers and Eckhardt 2022, page 11).

Mexican Period (1822–1848)

In 1821, Mexico gained its independence from Spain, and Alta California became one of the provinces of the Republic of Mexico. The area that eventually became Shasta County continued to be on the margins of Euro-American activity. Hudson's Bay Company trappers traveled extensively throughout the area in the 1820s under the direction of company governor, Dr. John McLoughlin, with orders to trap beaver to exhaustion. During an 1827–1828 expedition with the Snake River brigade, Peter Skene Ogden became the first fur hunter to reach the Pit River (FWPA, TN 250742, page 8). He named the waterway the Pit River because of the number of animal pit traps that the local Indians had constructed (De Novo 2010, page 3.4-7). American trapper Jedediah Smith led a fur trapping expedition through the Chico area in 1828, where they encountered Native American villages (Mengers and Eckhardt 2022, page 11). During these early forays, relations between the trapper and the Native American inhabitants were generally—though not always—peaceful (Rawls 1984, page 51; Secrest 2003, page 235). Nevertheless, contact with trappers and other Euro-Americans, even when civil, introduced diseases to the Yana (and the Achumawi and Atsugewi, to a lesser extent) to which they had no immunity (Cook 1976, pages 267–278).

In 1846, Mexico granted Pearson B. Reading the 26,000-acre San Buenaventura land grant, also known as Rancho Buenaventura and Native Americans soon found themselves in competition for resources with settlers who were rapidly moving into the area. In 1848, Reading discovered gold in Clear Creek and his discovery caused an influx of large numbers of gold-seekers to the area. The gold rush started an illegal land grab from, and genocide of, local Native Americans, which is discussed further in the subsequent section (FWPA, TN 250825, page 13; Bailin and Grossman 1971, page 2).

American Period (1848-present)

The United States of America's victory in the Mexican-American War of 1846–1848 ended Mexico's control of Alta California. Tens of thousands of gold miners arrived in California in 1849 and 1850. The gold rush era wreaked havoc on the local Native Americans, including the Pitt River Indians. By 1852, the U.S. Senate had rejected 18 treaties negotiated with California tribes because of pressure from miners and settlers who sought control over the land for its gold resources. As a result, Native American populations were subjected to brutal extermination efforts including massacres, starvation, and enslavement. The Native American population, once numbering over 100,000 in California, was reduced to around 20,000 by 1880. Between 1847 and 1852 alone, 4,000 Native Americans were massacred, and diseases like smallpox and syphilis

further decimated communities weakened by malnutrition (Bailin and Grossman 1971, pages 5–8).

Native Americans were enslaved through California's indenture laws, which allowed white settlers to force Indigenous children and adults into labor (Bailin and Grossman 1971, page 9). The kidnapping and sale of Native American children were rampant, with reports of systematic abductions occurring during the 1850s and 1860s (Bailin and Grossman 1971, pages 9–10). The California government was complicit, failing to prosecute the perpetrators of massacres and actively supporting military expeditions that led to the slaughter of Native Americans (Bailin and Grossman 1971, page 11).

Attempts by the federal government to establish reservations did little to help, as the land allocated was often barren and far from home, and Native Americans continued to suffer from starvation and disease (Bailin and Grossman 1971, pages 10–11), which underscores the systemic efforts to eliminate Native American populations and seize their lands, creating lasting impacts on Native American communities in California. The Pitt River Indians were able to make their way back from these reservations by looking to higher elevation mountain peaks for a pathway home, emphasizing the importance of the natural landscape to the Pit River Tribe (see Tribal Consultation: CEC Findings).

Shasta County was established in 1850 as one of the state's original 27 counties, encompassing all of what is now Modoc and Lassen counties, as well as portions of Plumas, Siskiyou, and Tehama counties. The original county seat was located at Reading's Ranch. Mining was the first and most prominent industry in Shasta County with lumbering as the second most prominent. (De Novo 2010, pages 3.4-8 and 3.4-9). Small towns developed quickly, adding grazing and agricultural industries, schools, and post offices (Mengers and Eckhardt 2022, page 12).

In 1872, the arrival of the Southern Pacific Railroad in Redding finally provided an efficient means of transporting lumber to other parts of California and as such, facilitated the expansion of larger-scale industrial activity including lumber from the eastern part of the Shasta County and copper mining north of Redding (Mengers and Eckhardt 2022, page 12).

Shasta County led California in copper, silver, and iron mining after the turn of the twentieth century. By 1920, virtually all mining had ceased, and the next two decades saw population contraction and economic hardship. A boom began with the construction of Shasta Dam (1938–1944) and continued after World War II. Major industries included recreation, forestry, electrical power, and agriculture. Post-War population increases led to further growth (Mengers and Eckhardt 2022, page 12).

Project Specific Historic Context of the Hatchet Mountain Area and Shasta County, 1820s–2000s

As noted above, the first Euro-American explorers to the northern Sacramento Valley were primarily fur traders who began to arrive in the early nineteenth century. The

expedition of Peter Skene Ogden across the northern Sacramento Valley in 1827–1828 is probably the earliest encounter between the Pit River tribe and Euro-Americans in the general vicinity of the proposed project. Succeeding expeditions of Euro-American explorers and fur trappers brought foreign diseases that took a huge toll on the Native Americans in northern California. Indeed, malaria and smallpox spread into the region in the 1830s and decimated entire villages, killing as much as 50–75 percent of Native American peoples in the state (FWPA, TN 250742, page 8).

Subsequent to this, or during the period of time extending from the late-nineteenth century to just prior to World War II, various branches of the Pit River Tribe continued to suffer from disease, starvation, a lack of housing, and access to modern facilities, as documented in detail in historic newspaper articles. The majority of newspaper articles cited below use the term Pitt River Indian, rather than Pit River Tribe. The term Pitt River Indians refers to the California Native Americans that anthropologists commonly called Achumawi or Achomawi, and sometimes includes the Atsugewi. The designators Pitt River or Pit River are used where appropriate.

The above noted historic devastations are documented in a series of 1920s newspaper articles describing various delegations from Washington D.C. and the California State Board of Health. A report prepared by Dr. Allen F. Gillihan, district health officer, and Alma B. Shaffer, public health nurse, documents the conditions among the Pitt River Indians and other tribes under the joint care of the federal government and the State of California in considerable detail. The report concludes the tribes were “famished by disease and death; that they are suffering under the most abject poverty; that they are in many cases in actual need of food and clothing; that they are receiving practically none of the “care” supposed to be exercised over them and that the land allotted to them is largely confined to lava beds and stretches of barren land.” The 1921 report further notes that seventy years prior, “the Indian population numbered 100,000. Today there are 15,000 of them. Eighty-five thousand of the original owners of the land that the whites now own died from neglect” (San Francisco Bulletin, July 20, 1921, page 12). Compounding these issues, was the previous and continued sale of Pitt River Indian land allotments to the highest bidder for “power site lands,” thus relegating many Native Americans to living on the above noted lava beds and stretches of barren land (Siskiyou Daily News, September 30, 1920, page 11).

The root cause of these calamities was that a series of treaties drawn up between May 31, 1851, and January 5, 1852, designed to provide Indian groups in California access, in perpetuity, to hunting and fishing grounds were never ratified due to the influence of powerful land interests in the California senate (Oakland Tribune, July 23, 1921, page 3).

Continued discussions throughout the 1920s and 1930s resulted in no major action to redress the suffering caused by unratified treaties, due largely to the fact that tribal needs and wants were presented by third party interests. As a result, in 1937, a delegation of a group of four Native Americans were elected to go to Washington D.C

to represent all California Indians reading SB 1651, a bill before the Senate to amend the Court of Claims Act of 1928, to allow the "Indians of California" to represent themselves in the court of claims and the Supreme Court of the United States. The group included "Clyde Thompson of Montgomery Creek, a member of the Pitt River Tribe, who has been a delegate to each state convention since 1921…" (Fresno Bee, June 1, 1937, page 11).

Once again, no action was taken, and in 1970, as described in a newspaper article in the Chico Enterprise-Record, a lawsuit was filed by Pitt River Indians against Governor Reagan based on the belief that treaties negotiated in 1851 and 1852 were not ratified and the Indians were driven from their land, and "that nearly 3.5 million acres of land were taken illegally from the tribe in the gold rush era" (Enterprise-Record, Chico, California, September 25, 1970, page 6).

Today, the "bands of the Pit River Tribe remain vibrant and active members of the community near the Pit River and retain strong interests in the management and protection of heritage and natural resources…" (KEA Environmental, 2000, page 16).

Pierson B. Reading was reportedly one of the earliest recorded non-Native Americans to settle in the region. In 1846, Mexico granted Reading the 26,000-acre San Buenaventura land grant, also known as Rancho Buenaventura, which extended west from the Sacramento River between Salt Creek on the north and Cottonwood Creek on the south. Soon after his arrival in Shasta County, Reading discovered gold in Clear Creek in 1848. His discovery incited an influx of gold-seekers to the area, and a community west of present-day Redding known as Horsetown quickly developed around the site. The initial dramatic growth of mining near Redding was relatively short-lived and mining operations declined and eventually stopped. The decline and cessation of mining in this area forced landowners and other residents to turn to different industries, such as agriculture, cattle ranching, and logging. However, the growing Euro-American population in Shasta County led to confrontations with the local Pit River Indians, who sought to drive out settlers from their tribal lands. To enforce Euro-American settlement in the region, the United States Army established a military outpost later known as Fort Crook roughly 7 miles north of present-day Fall River Mills in 1857 (FWPA, TN 250742, page 8).

Farming and ranching appear to have been the earliest industries in the Hatchet Mountain area. An 1868 article in the *Shasta Courier* noted that the area boasted the "finest agricultural and grazing lands in the northern portion of the state" (Shasta Courier 1868, page 2). Judge Aaron Carberry is the earliest known American settler with an agricultural property intersecting with the Survey Area in the 1880s and 1890s. His ranch was approximately one mile east of Hatchet Mountain Pass just south of present-day SR 299. According to the 1885 Shasta County Directory, Carberry was also the proprietor of the Spring Valley Hotel. Other early settlers in the vicinity included Benjamin B. and Elizabeth Ann Hawkins, who settled near Montgomery Creek in 1871 (west of the proposed project), Isaac W. Phillips and Emma Anna Hicks who settled in

Oak Run around 1880 (southwest of the proposed project), as well as W. H. and Martha Fender who also settled around Oak Run in the 1880s (FWPA, TN 250742, pages 8–9).

Despite the increasing number of Euro-American farmers and ranchers, Shasta County had few maintained roads traversing the mountainous and rough terrain. Road building was an important means through which to foster early trade and development; however, the state and county governments during this period allocated few resources to their development and maintenance. As such, communities organized among themselves to build local roads, including early residents in the vicinity of Hatchet Mountain who began raising money in 1868 to build a wagon road from Fort Crook to Shasta to be known as Fort Crook Road. The Millville and Burney Valley Wagon Company led by Superintendent John Jackson ultimately completed the first purpose-built wagon road through the area in 1873. It extended from Millville in the southwest to Burney in the northeast, passing north of Round Mountain and crossing Montgomery Creek. The Millville and Burney Valley Wagon Company operated the new wagon road as a toll road. Toll roads had proliferated throughout California by the late nineteenth century. The lack of state and municipal funding led to the construction of these private roads—usually for profit—beginning in the 1860s. Owners of tolls roads were charged with the maintenance of the road and the safety of travelers, while the tolls offset construction costs and paid for ongoing maintenance (FWPA, TN 250742, pages 8–9).

Following the construction of the Millville-to-Burney Toll Road, logging quickly surpassed agriculture as the primary industry in the vicinity of Hatchet Mountain. There were already several sawmills in operation elsewhere in Shasta County by this period as logging operations had dramatically expanded after the discovery of gold in 1848. Logging supplied miners and businessmen with wood for houses, stores, mining operations, and fuel. It also provided employment opportunities for unsuccessful miners and other immigrants entering the region and facilitated the continued growth of Shasta County towns and cities. By 1852, there were eight sawmills in the county and 12 by 1860, with a total production of 4,930,000 board feet. In 1872, the arrival of the Southern Pacific Railroad in Redding finally provided an efficient means of transporting lumber to other parts of California, facilitating the expansion of the logging industry across the county. Orison D. Morse established one of the first sawmills near the project area in 1872. The sawmill was northeast of Buzzard Roost on Montgomery Creek. Morse subsequently built a log flume that extended approximately 5 miles from his Montgomery Creek mill to a lumber dump near Round Mountain to the southwest. By 1886, the local newspaper in Redding noted that there were “three sawmills in the vicinity of Round Mountain within four miles of each other”—one owned by C. H. Holbrook and F. M. Phelps, another owned by Morse, and the last owned by someone referred to only by the last name of Chambers (FWPA, TN 250742, pages 9–10).

The growth of logging in Shasta County during the 1870s and 1880s fueled the formation of small settlements near Hatchet Mountain, which included Buzzard Roost, Montgomery Creek, and Burney. Buzzard Roost was a rest stop for travelers at the junction of Oak Run and Reid’s Toll roads—west of the proposed project. Established in

1869 by a man named Bussard, Lewis Ensign later took over the property in the 1880s, building a hotel, barn, blacksmith shop, and store at the site. There was also a post office for the Round Mountain area attached to the store. Herbert Bass established a second traveler rest stop a few miles northeast of Buzzard Roost on Montgomery Creek by the mid-1880s. Bass operated a hotel and blacksmith shop. There was also a store with an attached post office and a public school on the property. A third rest stop was to the northeast within the present-day town of Burney. A multi-purpose building that housed a post office, saloon, and store was established along present-day Main Street sometime in the 1870s. The property was later owned by Dr. C. W. Pierce by the mid-1880s. He built a hotel, several sheds, and a barn (FWPA, TN 250742, page 10).

By the 1880s, the wagon road through the Hatchet Mountain area was commonly referred to as the Jackson Toll Road, likely because John Jackson, former Superintendent of the Millville and Burney Valley Wagon Company, owned the toll road outright by this period. Dick Feeney became owner of Jackson Toll Road in 1885, possibly upon Jackson's death. In 1888, Feeney sold his shares of the road to his partner who newspapers note is named "Cummings;" however, this is likely a misspelling of Henry Cummegs, who later owned the toll road in this area. Upon Cummegs' death in 1898, he left the toll road to his housekeeper Charlotte Paine. Paine later sold the road to the county for $2,250 in 1906, after which it became a public county road (FWPA, TN 250742, page 10).

Logging operations within the proposed project expanded in the late 1880s after Joseph Enright purchased Morse's former holdings in 1886. The holdings included 160 acres of forested land, the Hatchet Mountain sawmill, five-mile flume, and surrounding water rights. Enright subsequently formed the Shasta Lumber Company with Holbrook and Phelps, amongst others, and made vast improvements to the facilities. One such improvement was extending the existing flume 32 miles from Hatchet Mountain to a newly purchased property in Bella Vista called Gipson Ranch. The flume carried rough cut lumber from an elevation of 4,200 feet on Hatchet Mountain to 525 feet at Bella Vista, passing through Buzzard Roost, Cedar Creek Canyon, the town of Ingot, and Swede Creek Plains. Stilted-flume tender houses were also built adjacent to the route for flume tenders and their families. At Gipson Ranch, the Shasta Lumber Company established a new lumber dump and built a box factory for finishing lumber. A new townsite was platted, and the company constructed offices, a general merchandise store, and other associated buildings. Additionally, the company built a new standard-gauge railroad from Gipson Ranch to the terminus of the Southern Pacific Railroad in Anderson, a line later known as the California, Shasta, and Eastern Railway (FWPA, TN 250742, pages 10–11).

In 1897, Joseph Terry took over Shasta Lumber Company's holdings after the company defaulted on their mortgage. Terry acquired the Bella Vista-Anderson railroad, 32-mile flume, 2,500 miner's inches of water, box factory and drying kilns at the lumber dump in Bella Vista, 28,000 acres of forested land, and the Hatchet Mount sawmill with a capacity of 10,000,000 feet of lumber per season. He also continued to make

improvements to the mill's operations. The Hatchet Mountain sawmill was expanded, and new living quarters for employees built. The mill site now included a residence for Terry and his family, company store, superintendent's residence, cook house, school, machine shop, community center, and several blocks of worker housing—one of which was for workers with families that was commonly referred to as "Baby Alley." Terry built a narrow-gauge logging railroad throughout the proposed project with approximately 10 miles of track. However, despite these improvements, Terry could not pay his creditors and the mill closed in 1919. It was later purchased by the Red River Lumber Company who operated the Hatchet Mountain mill from 1920 to 1922, after which the mill was permanently closed, although Red River Lumber Company appears to have continued other logging operations in the area (FWPA, TN 250742, page 11).

The Terry Mill closure coincided with the rise of automobile use in California. The introduction of mass-produced automobiles—beginning with Henry Ford's Model-T in 1908—led to a dramatic rise of automobile ownership from 19,561 vehicles in 1908 to 44,122 in 1910 to over half a million by 1920. As a result of growing automobile use, California began building and improving public roads throughout the state. In the Hatchet Mountain Area, the 1909 First State Highway Bond Act incorporated the existing county road (formerly the Millville-to-Burney Toll Road) into Legislative Route Number (LRN) 28 from Redding to Alturas as part of the Lassen State Highway. California state highway maps show this portion of LRN 28 as unimproved through 1922, after which the road was graded. Portions of the former toll road may have also been realigned between Montgomery Creek and Hatchet Mountain Pass. LRN 28 was originally 16 feet wide and then later widened to 20 feet and paved by 1934. The next year, LRN 28 was redesignated US Route 299. Portions of the highway within the proposed project were later realigned in the 1950s to reduce sharp curves and steep grades, and the highway widened to its current 30 feet at an unknown date (FWPA, TN 250742, pages 11–12).

Even after improvements were made to SR 299 in the 1920s and 1930s, development remained sparse within the vicinity of Hatchet Mountain throughout the pre-World War II period. Notable exceptions include the construction of Moose Camp just south of the SR 299–Moose Camp Road intersection. The Redding Lodge No. 1006 of the Loyal Order of the Moose built the camp in the early 1930s, improving it with a club house, garage, and roughly 37 cabins. Within the proposed project is a segment of the Pit 1 Vaca-Dixon 230-kV and Pit-Vaca Dixon No. 2 transmission lines. Pacific Gas & Electric (PG&E) completed these transmission lines between the Pit 1 Powerhouse on the Pit River and the Vaca-Dixon Substation near Vacaville in 1923 (FWPA, TN 250742, page 12).

The end of World War II kickstarted an era of great economic prosperity in the United States, leading to a boom in the tourism economy throughout the country. The car was the preferred mode of transportation for the postwar tourist, many of whom were driving to outdoor recreation facilities such as national and state parks, which saw an unprecedented rise in annual visitation during this period. The expansion in postwar

tourism to outdoor recreational facilities drew tourists to the Hatchet Mountain area on their way to one of several parks in the area, including McArthur-Burney Falls, Lassen National Forest, and Shasta-Trinity National Forest. Car oriented business—motels, restaurants, and other roadside attractions—flourished along regional highways like SR 299. The small communities within the vicinity of the proposed project benefited from this growing tourism. Burney is the largest community within the vicinity. By the 1950s, the town had grown to 1,513 people and boasted seven hotels, eight restaurants, two movie theaters, and five sporting goods stores (FWPA, TN 250742, page 12).

Although the Hatchet Mountain Mill shut down in 1922, logging continued to be an important business in the Hatchet Mountain area through the 1920s into the present. Edmund Philips and his eight sons established a steam-powered sawmill in 1933 and later a box factory near Oak Run, roughly 10 miles southwest of the proposed project. The Philips Brothers Mill is listed on the National Register of Historic Places (NRHP) at the local level under Criterion A as one of the last remaining steam-operated sawmills in California. Further east, Sierra Pacific Industries constructed a sawmill a mile southwest of Burney sometime before 1957. Sierra Pacific also harvested lumber from within the proposed project area during the 2000s, and before that the Roseburg Resources Company harvested lumber there in the 1990s. Logging continues within the proposed project to the present day and the land is managed by New Forest, Inc. (FWPA, TN 250742, page 13).

Methods

The methods employed for the cultural resources analysis include determining a Project Area of Analysis (PAA), reviewing records and other documents provided by a literature search and other historical sources as needed; consultation with California Native American tribes; and recently conducted historic architectural and archaeological surveys.

Project Area of Analysis

The PAA defines the geographic area in which the proposed project has the potential to affect cultural or tribal cultural resources. Effects may be immediate, further removed in time, or cumulative. They may be physical, visual, audible, or olfactory in character. The PAA may or may not be one uninterrupted expanse. It could include the site of the proposed project, the routes of requisite transmission lines and water lines and other pipelines, and other offsite ancillary facilities, in addition to one or several discontinuous areas where the project could arguably affect cultural or tribal cultural resources. Staff's PAA is depicted in Figures 1–2 below.

The California Energy Commission (CEC) staff defines the archaeological component of the PAA as all areas where the applicant proposes ground disturbance (temporary and permanent) to construct and operate the proposed project (Figures 1 and 2). The various components of the proposed project and estimated depths of ground disturbance are summarized below.

The proposed project includes the construction, operation, maintenance, and decommissioning of up to 48 wind turbines and related infrastructure. Turbines would be no more than 610 feet from ground level to the top of the blade. Each would be mounted on a concrete pedestal supported by a permanent foundation. Associated infrastructure and ancillary facilities would include the following (FWPA, TN 250742, page 1):

- 34.5-kV overhead and underground collector lines and fiber optic communication cabling
- On-site substation comprising a control house, bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lighting-suppression conductions
- On-site switching station that may include a microwave relay tower up to 150 feet tall
- One 10-acre temporary construction and equipment laydown area to store equipment and materials, host construction trailers, refuel equipment, and store construction waste temporarily
- Fourteen 2-acre temporary laydown areas located throughout the Project site to stage building materials and equipment
- Operation and maintenance (O&M) facility, storage yard, and parking area;
- Up to four permanent meteorological towers and temporary, episodic deployment of mobile Sonic Detection and Ranging or Light Detection and Ranging systems
- Two storage sheds
- Three temporary batch plants

A summary of the depths and widths of disturbance for the above noted infrastructure and ancillary facilities project improvements follows.

The underground collector system would consist of insulated cables buried in trenches that are 46 inches deep and at least 12 inches wide. Cables generally would be co-located with turbine access roads to minimize ground disturbance. In areas where the underground collector system would be co-located with both new and existing access roads, no additional ground disturbance would be required to install the underground electrical collection system beyond that which is disclosed in the impacts for the widening of the road. Where cable trenches cannot be co-located with access roads, a temporary, 50-foot-wide disturbance area would be required to install the cable. During operations, a permanent, 30-foot-wide corridor centered on the buried cable would be maintained clear of woody vegetation (FWPA, TN 250742, page 2).

The 34.5-kV overhead electrical collector system would be installed on wood poles with a maximum height of 90 feet and wire heights approximately 20–30 feet above the

ground depending on the span; however, special circumstances may require greater wire clearances. Installation of the overhead collector line could require a temporary workspace consisting of an approximately 100-foot-wide corridor centered on the center line of the overhead line. An approximately 80-foot-wide corridor would be maintained during the operations phase. This area would be kept clear of taller woody vegetation to provide for safe operations and allow access for equipment inspections, vegetation control, and maintenance (FWPA, TN 250742, page 2).

The Project would tap into the existing PG&E Pit-Vaca Dixon No. 2 transmission line via a new aboveground line tap located adjacent to the new switching station. To complete the interconnection, an existing transmission tower would be removed from the Pit-Vaca Dixon No. 2 and replaced with four tubular steel poles up to 125 feet tall. The conductor would be routed along the four new poles and into the switching station to connect to the Project's electrical infrastructure (FWPA, TN 250742, page 2).

The Project would be accessed via existing, gated logging roads located off SR 299. Existing roads would be modified and may be graveled to safely accommodate turbine component delivery vehicles and heavy equipment. The driving surface would be widened to 20 feet plus a 15-foot construction buffer on either side resulting in an approximately 50-foot-wide disturbance area. In some areas, the construction cleared area could be up to 200 feet wide to accommodate significant cut-and-fill, stormwater controls, road design, and blade-delivery-vehicle turning radii. Select segments of road may be graveled. Existing gates may be replaced or reinforced. Existing culverts would be upgraded or replaced as needed to maintain a functional stormwater drainage system and meet fire safety and access standards. New internal access roads would also be constructed within the Project site. New roads would be 20 feet wide with a 15-to-75- foot construction buffer on either side. After construction, permanent access roads would be reduced to a 20-foot driving surface with a 1-foot shoulder. An additional 15 feet on either side may be required in some areas to accommodate stormwater drainage and ditches. Permanent access roads would be periodically graded and compacted to minimize erosion (FWPA, TN 250742, page 2).

Table 5.4-1 below provides additional detail on depths of excavation is included in the revised Stantec Phase 1 archaeological survey report (FWPA, TN 250825, page 2).

TABLE 5.4-1 PROJECT ELEMENTS AND DEPTH OF DISTURBANCE (FWPA, TN 250825, page 2)

Element	Depth of Disturbance in Feet
Turbine foundation	15
Underground electrical collector system	5
Onsite collector substation	5
Onsite switching station	4
O&M building foundation	5
Temporary batch plants	4
Permanent MET tower foundations	4
New roads and modifications to existing ones (incl. grading)	3

The historic built environment PAA for the proposed project includes buildings and structures within a 0.5-mile buffer surrounding the archaeological PAA (**Figures 5.4-1** and **5.4-2**). The 0.5-mile buffer considers visual impacts to surrounding built environment resources.

For ethnographic resources, the PAA considers sacred sites, tribal cultural resources, traditional cultural properties (places), and larger areas such as ethnographic landscapes that can be vast and encompassing, including view sheds that contribute to the historical significance of such resources. The Native American Heritage Commission (NAHC) assists project-specific cultural resources consultants and agency staff in identifying these resources, and consultation with Native Americans and other ethnic or community groups may contribute to defining the PAA. In the case of the proposed project, the immediate environs consist largely of rural, undeveloped land. Information from local Native Americans has emphasized the importance of the topography and surrounding viewshed, particularly from surrounding mountain tops. Staff therefore treats the ethnographic component of the PAA as consisting of the archaeological PAA plus a general 1-mile buffer. Burney Mountain, which is a little more than 1 mile from proposed project has also been included in the ethnographic PAA because the proposed project is visible from the top of Burney Mountain (**Figure 5.4-3**).

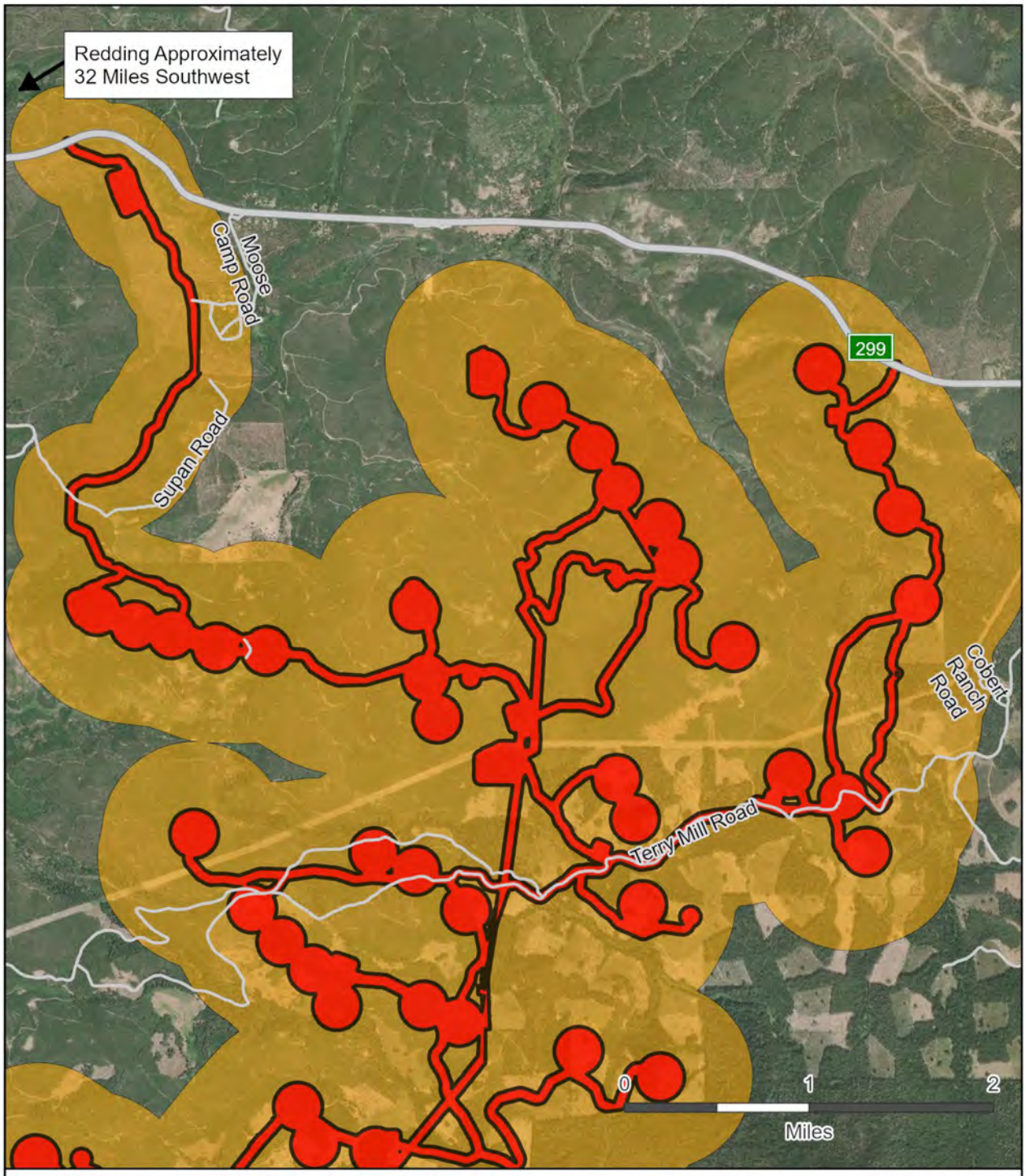


Figure 5.4-1
Cultural Resources

Note: Built Environment PAA was created by CEC staff. It represents the extent of the Project Site and a 1 mile radius around the project site.

Sources: Stantec Data June, 2023 & CEC Staff

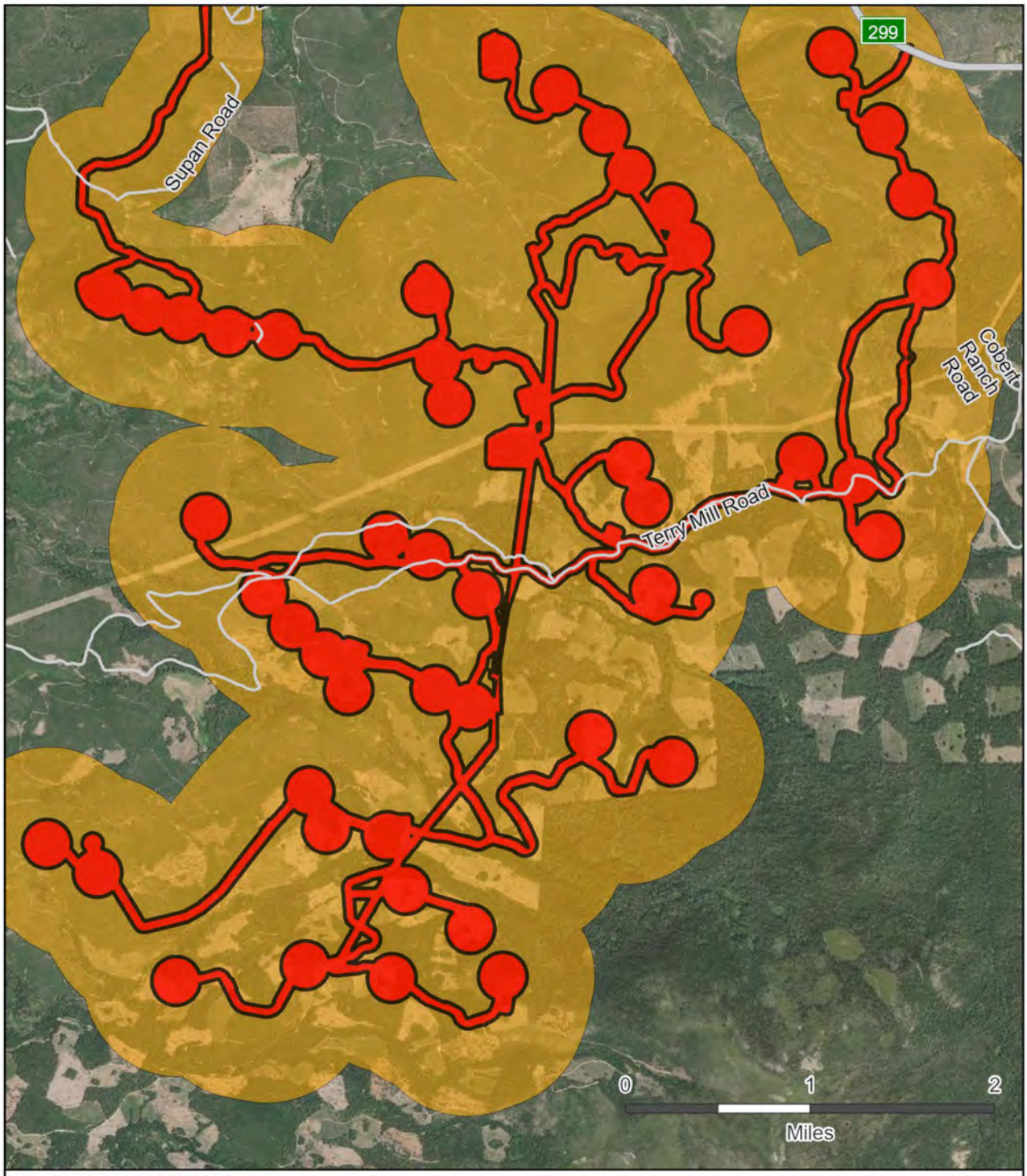
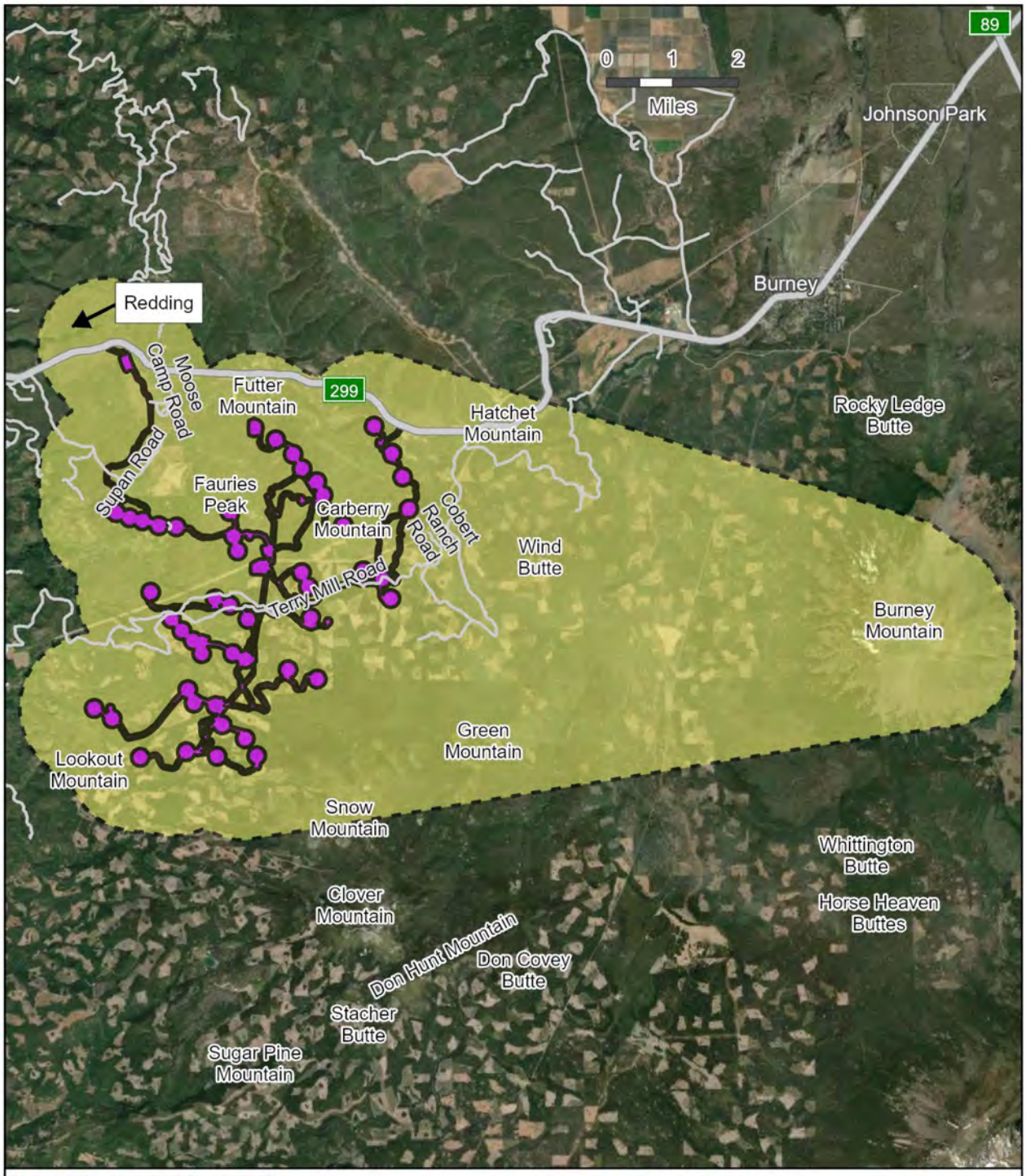


Figure 5.4-2
Cultural Resources

Note: Built Environment PAA was created by CEC staff. It represents the extent of the Project Site and a 1 mile radius around the project site.

Sources: Stantec Data June, 2023 & CEC Staff


89
0
1
2
Miles
Johnson Park
Redding
Burney
Camp Moose Road
Futter Mountain
299
Hatchet Mountain
Rocky Ledge Butte
Supan Road
Fauries Peak
Carberry Mountain
Cobert Ranch Road
Wind Butte
Terry Mill Road
Burney Mountain
Green Mountain
Lookout Mountain
Snow Mountain
Whittington Butte
Clover Mountain
Horse Heaven Buttes
Don Hunt Mountain
Don Covey Butte
Stacher Butte
Sugar Pine Mountain
Project Site
Ethnographic PAA
Figure 5.4-3
Cultural Resources
Note: Ethnographic PAA was created by CEC staff. It represents the extent of the Project Site, a 1 mile radius around the Project Site, and extends east to include Burney Mountain.
Sources: Stantec Data June, 2023 & CEC Staff
3
5
89
Shasta Lake
Pit River
299
Shasta County
Redding
44
36
Lake Almanor

Literature Review and Record Search

On behalf of the applicant, Stantec requested records searches of the California Historical Resources Information System from the Northeastern Information Center (NEIC) on September 13, 2017 (NEIC File No. D17-150) and June 2, 2023 (NEIC File No. NE23-241). The purpose of these searches was to determine whether the PAA and surrounding 1-mile buffer contained any previously recorded resources that were currently listed in national or state landmark or historic district programs and whether it contained resources that have been previously identified or evaluated as potential historical resources. All recorded historic and Native American cultural resources situated within the PAA and surrounding buffer were reviewed, as were all known cultural resource surveys and excavation reports (FWPA, TN 250742, pages 13–14).

The following sources were consulted during the records searches:

- National Register of Historic Places (NRHP)
- California Register of Historical Resources (CRHR)
- California Inventory of Historic Resources (CHRI)
- California Historical Landmarks (CHL) list
- California Points of Historical Interest (CPHI) list
- Other California OHP Databases including Historic Bridge Inventory

Additional Research

Stantec consulted the California Built Environment Resource Directory (BERD) to determine if the built environment PAA contains any resources listed in or determined eligible for the NRHP or CRHR, designated as CHL or CPHI, or evaluated in historic resource surveys and other planning activities. No historical resources or potential historical resources listed in the BERD are in or intersect with the built environment PAA (FWPA, TN 250742, page 18).

The CEC staff conducted in-depth historical research on the history of the built environment PAA and surrounding region using primary sources and provided this research to Stantec. Stantec incorporated this research and conducted additional research including a review of previous cultural survey reports, historic-period newspapers, U.S. Federal Decennial Population Census records, Shasta Historical Society archival materials, and secondary online reference materials. Historical maps and aerial images from the Shasta Historical Society, Bureau of Land Management (BLM), General Land Office (GLO), U.S. Geological Services (USGS), and University of California, Santa Barbara (UCSB) were also consulted to identify built environment resources more than 45 years old within the built environment PAA. This included but was not limited to (FWPA, TN 250742, page 18):

- 1874 GLO Map – 35N 1E
- 1879 GLO Map – 35N 2E

- 1884 Map of Shasta County (from Shasta Historical Society)
- 1885 GLO Map – 34N 1E
- 1885 GLO Map – 34N 2E
- 1886 USGS Map – Lassen Peak, CA
- 1892 GLO Map – 35N 2E
- 1892 USGS Map – Lassen Peak, CA
- 1894 (1924 ed.) USGS Map – Lassen Peak, CA
- 1904 Edward Denny & Co. Map of Shasta County, California
- 1939 USGS Map – Burney, CA
- 1952 UCSB aerial photographs
- 1954 USGS aerial photographs
- 1956 USGS Map – Montgomery Creek
- 1969 USGS aerial photographs
- 1973 USGS aerial photographs
- 1974 USGS aerial photographs
- 1975 USGS aerial photographs

Tribal Consultation

Applicant's Correspondence

Stantec, on behalf of the applicant, requested a search of the Sacred Lands File (SLF) and a contact list from the NAHC on September 17, 2017. The purpose of the search was to ascertain whether there were additional resources or locations that may be of importance to Native Americans who have traditionally resided in the area encompassing the proposed project. On September 19, 2017, the NAHC responded and provided contact information for two local tribes who may have additional information, the Pit River Tribe of California and the Redding Rancheria.

Due to refinements to the proposed project footprint, a SLF search focusing on an updated footprint was resubmitted on October 29, 2019. A response was received on November 13, 2019, stating a review of their files yielded positive results. The NAHC also provided contact information for two local tribes who may have additional information. On November 15 and 20, 2019, at the request of the applicant, outreach letters were sent to the contact list provided by the NAHC as well as the contact list provided to the applicant by the California Department of Forestry and Fire Protection (CAL FIRE). Follow up calls were made to all the listed contacts on December 4, 2019 (FWPA, TN 250825, pages 20–21; FWPA, TN 248291-1, page 2).

Tribes contacted as part of this outreach effort were:

- Pit River Tribe of California
- Greenville Rancheria
- Wintu Educational and Cultural Council
- Nor-Rel-Muk Wintu Nation
- Redding Rancheria
- Shasta Nation
- Winnemem Wintu Tribe of Northern California

Extensive additional correspondence and follow-up tribal consultations including a site visit have taken place.

CEC Consultation

The California Environmental Quality Act (CEQA) requires lead agencies to consult with all California Native American tribes that have traditional and cultural affiliation with the geographic area of a project, and that have previously requested consultation. To invoke an agency's requirement to consult under CEQA, a tribe must first send the lead agency a written request for formal notification of any projects within the geographic area with which they are traditionally and culturally affiliated (Pub. Resources Code, § 21080.3.1(b)). The CEC does not have prior requests for CEQA consultation from any of the tribes affiliated with the project vicinity. Therefore, the CEC staff began its review of the application without formal tribal consultation requirements under CEQA with respect to these tribes (but see "Results, Tribal Consultation: CEC Findings").

Additionally, consistent with the CEC's tribal consultation policy (CEC 2024), the CEC staff received the results of a Sacred Lands File search from the California Native American Heritage Commission on February 7, 2023. On November 3, 2023, the CEC staff sent 10 tribal consultation letters inviting tribes to consult on the Fountain Wind Project. These consultations were carried out consistent with Public Resources Code sections 21080.3.1, 21080.3.2, 21082.3, 21084.2, 21084.3 and 245545.7.4 (CEC 2023m).

Archaeological Survey

Between January 17 and September 20, 2018, and October 7 and November 3, 2019, Stantec archaeologists conducted six rotations of pedestrian field surveys of the proposed project footprint. The final survey area encompassed 4,463 acres of private property. The entire survey area was subject to analysis as part of Stantec's inventory. The majority (80%) of the survey area was inventoried by archaeologists walking linear transects at an interval not more than 15 meters (50 feet) apart. Twenty percent of the Survey Area comprised areas of extreme slope (defined as greater than 30%) or impassable vegetation and were considered unsafe to inventory at the set transect

interval. These areas were inventoried by walking established safe downslope paths where possible and inspecting adjacent areas visually. Areas with limited ground visibility were inspected using a combination of visual inspection of rodent burrows, road cuts, and periodic removal of vegetation cover by the surveyors (done at a frequency of about every 25 meters or 82 feet on a given transect) using shovel or boot scrapes. If sites were identified in areas with limited to no surface visibility a visual inspection of boot scrapes, rodent burrows, road cuts, and topography was implemented to determine site boundaries. No subsurface testing was undertaken during the survey (FWPA, TN 250825, pages 21–22). Stantec archaeologists surveyed a 152-meter (500-foot) radius around proposed wind turbine locations, and a corridor 152 meters (500 feet) wide around project roads and electrical collection lines (76 meters [250 feet] on either side of the centerline). Stantec archaeologists surveyed an area 152 meters (500 feet) wide around proposed staging and temporary impact areas. Lastly, Stantec archaeologists surveyed a corridor 60 meters (200 feet) wide around the aboveground electrical collection line 30 meters (100 feet) on either side of the center line (FWPA, TN 250825, page 24).

After Stantec's pedestrian survey, the proposed project was refined because the number of wind turbines was reduced. This overall reduction has led to the current proposed project footprint, which is equivalent to the archaeological PAA.

Historic Architectural Survey

The historic architectural survey was conducted by Stantec Architectural Historians Rebecca Riggs and Alana Vidmar who conducted a field inspection of the built environment PAA on May 22–24, 2023. During the survey, the general condition and physical integrity of all built resources more than 45 years old with the potential to be impacted by the proposed project were assessed. (FWPA, TN 250742, page 13.)

Results

Literature Review

The records searches indicate that the area has been previously studied and 64 known resources (18 Native American archaeological, one multi-component, and 45 historic-era resources) are located within 0.25 mile of the archaeological PAA, none of which are located within the archaeological PAA.

Lastly, two previously recorded built environment resources were identified within the built environment PAA, an existing transmission line and a railroad logging system.

Tribal Consultation: Applicant's Findings

On September 19, 2017, the NAHC responded to the applicant's September 17, 2017, request for a search of the Sacred Lands File (see "Tribal Consultation: Applicant's Correspondence" above), stating that a review of their files yielded positive results for sacred lands located within the vicinity of the proposed project.

Input from tribes during the scoping process, various correspondence, and during meetings between the tribes, Stantec, and the applicant note that natural and cultural resources are indistinguishable from the Pit River Peoples and are a central element of the spirituality, traditional ceremonial practices, religious expressions, history, and identity of the tribe and tribal members. Tribal members explain that the tribe and its nation have deep ties to the area, which they describe as a place of refuge, ceremony, healing, prayer, fasting, hunting, gathering, and other sacred traditional uses. Tribal members indicate that burial grounds are believed to be present in the Project Site, but the exact location is unknown. Tribal members expressed concern that the construction, operation, and maintenance of the proposed project could infringe on the freedom of religion and the cultural practices of the Pit River Tribe and other California Native American tribes in the region and that the proposed project could adversely affect sacred sites, traditional plants, and the viewshed of mountains held sacred by the Pit River Tribe (Stantec 2020a, page 3.6-16). These resources collectively contribute to a tribal cultural landscape, which is considered a tribal cultural resource for the purposes of the CEQA analysis.

Tribal Consultation: CEC Findings

The Pit River Tribe submitted a letter dated November 2, 2023, requesting that the CEC engage in AB 52 consultation (pursuant to Pub. Resources Code, § 21080.3.1) with the Pit River Tribe concerning the proposed project. The CEC staff responded by email on November 21, 2023, asking for a date and time to initiate consultation (CEC Email November 21, 2023). On January 11, 2023, consultation was initiated between the CEC staff and the Pit River Tribe.

The Pit River Tribe and CEC staff held four consultation meetings over Zoom on January 11, July 29, August 26, and September 19, 2024. Participants included the chairman of the Pit River Tribe, tribal historic preservation officers, representatives of several bands of the Pit River Tribe, tribal elders, legal representatives for the Tribe and CEC staff, CEC staff consultant Aspen Environmental Group, the CEC's tribal liaison, and CEC's assistant tribal liaison/Cultural Resources Unit supervisor for the Siting, Transmission, and Environmental Protection Division.

The consultation meetings were not public because the Pit River Tribe and CEC staff discussed culturally sensitive matters that require confidentiality. The CEC staff described the proposed project to the Pit River Tribe and answered questions about the project description and analytical methods. Topics discussed include appropriate representation of the Pit River Tribe's history, the precolonial archaeological record, the significance of Hatchet Ridge-Bunchgrass Mountain and the wider cultural landscape that the CEC staff calls the Montgomery-Hatchet Creek Tribal Cultural Landscape, impacts, mitigation measures (conditions of certification), and alternatives to the proposed project.

Most information in this DEIR about the Montgomery-Hatchet Creek Tribal Cultural Landscape originated with the Pit River Tribe and is information that the Tribe

previously shared in public forums and documents to preserve their tribal cultural resources. Tribal representatives added to the CEQA-focused discussions that the proposed project represents the continuing dispossession and genocide of the Pit River Tribe, the Tribe and other local residents are united in the desire to preserve the natural beauty and cultural heritage of this area, and that no mitigation measures can reduce the impacts of the proposed project to a less-than-significant level. As of publication of this DEIR, the CEC staff continues consultation with the Pit River Tribe with a focus on alternatives.

Identified Cultural and Tribal Cultural Resources

Stantec archaeologists conducted an intensive reconnaissance-level pedestrian field survey of the archaeological PAA resulting in the recordation of 12 newly discovered archaeological sites, all historic-era, with one containing a Native American component. Additionally, crews identified and recorded 24 Native American and historic isolates. Stantec archaeologists also revisited and updated 10 previously recorded resources. CEC staff identified a tribal cultural landscape in the PAA. (**Table 5.4-2**.)

Several previously recorded built environment resources were identified within the built environment PAA. The Stantec survey crew also identified several unrecorded built environment resources within the Study Area including current and decommissioned segments of California State Route (SR) 299 and logging roads within the Hatchet Mountain area. A summary of newly recorded and updated sites identified during the surveys are included in **Table 5.4-2** below.

TABLE 5.4-2 IDENTIFIED RESOURCES

Primary Number	Trinomial or Another Identifier	Type	NRHP/CRHR Eligibility	New Record or Update	Within PAA
-	-	Hatchet Mountain Area Logging Roads	Not Eligible	New	Yes
-	-	Segments of Hwy 299	Not Eligible	New	Yes
P-45-001988	CA-SHA-1988H	Railroad logging camp and railroad grade	Not Eligible	Update	Yes
P-45-001989	CA-SHA-1989H	Historic Debris	Not Eligible	Update	Yes
P-45-001986	CA-SHA-1986H	Historic railroad logging camp and railroad grade	Not Eligible	Update	Yes
P-45-002025	CA-SHA-2025H	Historic Terry Mill railroad logging system	Not Eligible	Update	Yes
P-45-002939	N/A	PG&E Pit Vaca-Dixon Transmission Line	Eligible	Update	Yes
P-45-003068	N/A	Historic yarder mound	N/A	Update	Yes
P-45-003069	N/A	Water Conveyance System	Not Eligible	Update	Yes
P-45-002014	N/A	Logging Camp	Not Eligible	Update	Yes
N/A	FOU-919-2-14	Donkey Mound	Not Eligible	New	Yes
N/A	FOU-0920-2-1	Can Scatter	Not Eligible	New	Yes
N/A	FOU-0923-1-2	Historic Debris Scatter	Not Eligible	New	Yes

TABLE 5.4-2 IDENTIFIED RESOURCES

Primary Number	Trinomial or Another Identifier	Type	NRHP/CRHR Eligibility	New Record or Update	Within PAA
N/A	FOU1015	Historic Logging Equipment	Not Eligible	New	Yes
N/A	FW 3	Historic Debris	Not Eligible	New	Yes
N/A	FW 6	Historic debris and isolated lithic	Not Eligible	New	Yes
N/A	FW 11	Multicomponent lithic scatter and historic debris	Native American Component eligible. Historic Component not eligible	New	Yes
N/A	FW 12	Historic Debris	Not Eligible	New	Yes
-	-	Hatchet Ridge-Bunchgrass Mountain	Determined Eligible	-	Yes
-	-	Montgomery-Hatchet Creek Tribal Cultural Landscape	Recommended Eligible	-	Yes

Additionally, 13 isolates were recorded within the archaeological PAA, five of which are Native American artifacts including obsidian projectile points and flakes, and a basalt biface (Table 5.4-3). The remaining isolates were historic age (ISO 3, ISO 4, ISO 5, FW-ISO-12, ISO-003, ISO-005, ISO-006). None of the isolates are individually considered historical resources or unique archaeological resources under CEQA; however, the Native American isolates contribute to the overall Tribal Cultural Landscape, as they provide evidence of tool making and imply the hunting and gathering practices that were identified as being one of many traditional uses to local Native American tribes (FWPA, TN 248291-1, page 8).

TABLE 5.4-3 NATIVE AMERICAN ISOLATES IN THE ETHNOGRAPHIC PAA- CONTRIBUTORS TO THE TRIBAL CULTURAL LANDSCAPE

Isolate Number	Description
ISO 6 (FOU0921-1-1)	Obsidian Debitage
ISO 2 2019	Obsidian Flake
ISO 15 2019	Obsidian Projectile Point
ISO 17 2019	Obsidian Biface
ISO 18 2019	Basalt Biface

Provided below are brief descriptions of the archaeological sites and built environment features identified within the PAA and their CRHR evaluations, beginning with those resources that were previously recorded.

P-45-001986. This site was originally recorded in 1992 as a historic railroad logging camp (Incline Camp/Roseburg 4-1) along a railroad grade (itself part of P-45-002025, the Terry Mill Railroad Logging System). Three features associated with structures were

identified and recorded at Incline Camp/Roseburg 4-1 in 1992. Associated artifacts include glass, ceramic, and metal. Some artifacts were collected at the time of the recording. On September 20, 2018, Stantec relocated the site. Feature 2, a 15-foot-by-20-foot rectangular pit with an earthen berm, was identified. Feature 1 (12-foot square with a slightly raised rock floor and square nails) and Feature 3 (raised earthen pad with metal debris, possible blacksmithing area) were not relocated. Artifacts associated with the camp were relocated: 39 barrel hoops, a braided cable, nails, a cast iron stone part, can fragments, and brown glass fragments. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under Criteria 1 through 4 (FWPA, TN 250825, page 44).

P-45-001988/P-45-001989. Loop Camp/Roseburg 13-2 (P-45-001988) was recorded in 1993 as a historic-era railroad logging camp. Artifacts and features consist of one concrete pad and hearth, two earthen mounds, and a concentration of artifacts scattered over the northeast portion of the site consisting of over 200 cans in 1993. Some artifacts were collected at the time of the 1993 recording. On October 12, 2018, Stantec archaeologists relocated the site. Two possible privy pits and linear ditch depressions were observed. Artifacts include a can scatter, milk glass jar, metal stove parts, logging cables, brown glass fragments, and metal strips (FWPA, TN 250825, pages 43–44). The artifact scatter from P-45-001988 extends into P-45-0001989. These resources are likely one larger site as they are only 125 feet apart and an unrecorded historic artifact scatter is between P-45-001988 and P-45-001989 (Stantec 2020a, page 3.6-10), so they are combined for the purposes of this analysis.

P-45-001989 was originally recorded in 1993 and consists of a 90-meter north/south by 65-meter east/west historic-era resource. The site consists of the remnants of logging operations and associated artifacts (Wye Operations/Roseburg 13-3). Some artifacts appear to have been collected at the time of the 1993 recording. Historic debris is present in between the original site boundaries for P-45-001988 and P-45-001989.

The site does not possess any distinctive historic design characteristics or methods of construction, nor is it linked to any important event or person (CRHR criteria 1 through 3). However, the identification of two privies could have the potential to yield important information to local area. Historically, privies were not only used as outhouses, but often for trash disposal. Privies could lead to additional information about the status and background of the person or persons working at these logging camps, including the social status, type of food or drink consumed, etc. Therefore, this site is recommended as eligible under CRHR Criterion 4 for its research potential.

P-45-002014. This resource was originally recorded in 1992 as a logging camp with log chutes, loading decks, numerous structures, and associated artifacts. The 2018 Stantec visit relocated Datum B, a large stump with cable wrapped around it; Feature F12, a large structure flat that does not match its original configuration because its

edges eroded away distorting its shape and creating a gradual slope along its edges; a large, diverse artifact scatter; railroad grade segments; twisted cable; butchered bone; condensed milk cans; steel pipe; sheet metal; barrel hoop straps; white improved earthenware; and a heating apparatus. Other previously recorded features, including structures and chutes, could not be relocated. The resource has been heavily disturbed and impacted by recent logging, fire, road maintenance, and erosion. This resource is recommended as not eligible to the CRHR due to a lack of integrity (Stantec 2020a, pages 3.6-11–13).

P-45-002025. This resource is the historic era remains of the Terry Mill Railroad Logging System consisting of through cuts and fills located in various locations. Stantec visited multiple sections of this resource. One location has been heavily disturbed since its original recording.

On September 19, 2018, Stantec field crew visited a previously recorded segment of P-45-002025. From the intersection of P Line and T Line road, traveling approximately 2,400 feet west along P Line road, P-45-002025 railroad grade has been destroyed by modern logging activity within the last 5 years.

A berm segment follows the railroad grade and has been heavily disturbed by modern logging, including a recently abandoned logging road. The berm is composed of soil and is partially covered in vegetation. Two metal fragments are associated with the berm. To the south, there is a seasonal stream that seems to be a result of a modern erosion control ditch at the east end of the berm. Other sections of the railroad grade were not observed during the survey.

Additionally, two associated features are included within the site. The first associated feature of the Terry Mill Railroad Logging System, is a logging camp, that was recorded in 1992 and given a separate Primary number (P-45-002014). This resource was originally recorded in 1992 as a logging camp with log chutes, loading decks, numerous structures, and associated artifacts. The 2018 Stantec visit relocated Datum B, a large stump with cable wrapped around it; Feature F12, a large structure flat that does not match its original configuration because its edges eroded away distorting its shape and creating a gradual slope along its edges; a large, diverse artifact scatter; railroad grade segments; twisted cable; butchered bone; condensed milk cans; steel pipe; sheet metal; barrel hoop straps; white improved earthenware; and a heating apparatus. Other previously recorded features, including structures and chutes, could not be relocated (Stantec 2020a, pages 3.6-11–13).

The second associated feature is recorded as P-45-003068. This resource was originally recorded as a yarder mound measuring 1.5 meters tall, 6 meters wide, and 40 meters long. Road 200T bisects the mound. The resource was relocated and is relatively unchanged (FWPA, TN 250825, page 45).

The site and its associated features do not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, pages 44–45).

P-45-002939. This resource consists of the 230-kV Transmission line, including towers and lines. This segment runs from the town of Burney to the Cottonwood Substation in Cottonwood, California. Stantec revisited this resource during survey efforts. This resource remains unchanged since its original recording in 1999.

In 2017, JRP Historical Consulting, LLC, determined the Pit 1 Vaca-Dixon 230-kV Transmission Line individually eligible for the NRHP and CRHR, and as a contributor to the Pit 1 Hydroelectric Plant Historic District. JRP did not formally evaluate Pit-Vaca Dixon No. 2 as part of the Pit 1 Vaca-Dixon 230-kV Transmission Line; however, they did recommend it eligible for the NRHP under criterion A and C as part of the integrated transmission system developed to transmit electricity from the Pit 1 Powerhouse. Based on JRP's findings, Stantec on behalf of the applicant recommends the Pit-Vaca Dixon No. 2 as a CRHR-eligible historical resource (FWPA, TN 250742, pages 15–16).

P-45-003068. On January 19, 2018, Stantec field crews visited P-45-003068. This resource was originally recorded as a yarder mound measuring 1.5 meters tall, 6 meters wide, and 40 meters long. Road 200T bisects the mound. The resource was relocated and is relatively unchanged. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under Criteria 1 through 4 (FWPA, TN 250825, page 45).

P-45-003069. On September 23, 2018, Stantec field crews attempted to visit P-45-003069 (Meadows Water Conveyance Ditch and Flume). This resource was originally recorded as a water conveyance system. Specifically, a ditch measuring approximately 0.33 meter deep and 0.66 meter wide. The survey crew was unable to relocate this resource.

FOU919-2-14. This site consists of an irregular mound, approximately 3 feet high with a circumference of 90 feet, most likely a "donkey mound." A donkey mound is created by the logs being dragged by the steam donkey associated with logging. The site is located adjacent to a dirt access road in a wooded area. The area is heavily disturbed by modern logging activity. The mound has been heavily disturbed by erosion and logging. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, page 46).

FOU0923-1-2. This site consists of a small historic trash scatter located on the western side of Supan Road. Artifacts observed include eight fuel cans, a small oil

reservoir, a crushed metal bucket, two metal oil cans, and a small metal gas can. The site measures 100 feet north–south by 10 feet east–west. A metal car part is in the northern portion of the site with no other diagnostic elements. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, page 49).

FOU0920-2-1. This resource consists of a small can scatter located south of an access road under a transmission line. Artifacts observed include three tin cans, two of which have puncture holes and one is a hinge top. Miscellaneous metal parts were also observed. The site measures 50 feet north–south by 10 feet east–west. The area has been heavily disturbed by the access road. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, page 48).

FOU1015. This resource consists of historic debris and features measuring 85 feet north–south by 100 feet east–west located directly south of 270P Access Road. Feature 1 is a “donkey mound” measuring 94 feet east–west by 45 feet north–south. Feature 2 is a rail segment measuring 13 feet long. Feature 3 is a linear ditch running northeast–southwest and measuring 14 feet long. Associated artifacts include a logging cable. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, page 46).

FW 03. This is a small historic refuse scatter located across the road from P-45-003392 in a cleared-out forest plantation. The inventory includes a “Bayer Aspirin” tin (1-13/16” x 1-7/16” x 2/16”), a vegetable can (3” x 2-11/16”), four sanitary cans (4-6/16” x 3”), a ”Kerr Mason” jar lid (2-11/16”), various assorted brown and clear glass fragments, two modern bottle caps, and one clear glass jar with screw top and a makers mark (2-2/16” x 4-6/16”). The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as 5having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, page 49).

FW 06. This site consists of historic debris located within a transmission line corridor. Artifacts include a barrel hoop, tobacco can, whiteware fragments, glass, and a railroad spike. One obsidian flake was also observed. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is

recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, page 50).

FW 11. This multicomponent site consists of a lithic scatter and historic logging artifacts. The prehistoric component consists of a possible tool manufacturing site and contains identified tools. Although no archaeological excavation was conducted at this site, the presence of a variety of lithics and tools at the site indicates that there is a possibility to yield additional information in prehistory beyond the existing documentation of the site. The historic component consists of a deposit of unassociated logging debris and no diagnostic artifacts. After conducting historical research guided by onsite data and previous research, the applicant has determined there is no indication of this site being associated with any person or entity or event important in the past. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Based on these observations, the applicant found the site not eligible under CRHR under criteria 1–3, but eligible under Criterion 4 for its research potential (FWPA, TN 250825, pages 42–43). Therefore, archaeological site FW 11 qualifies as a historical resource for the purposes of CEQA.

FW 12. This is a historic refuse scatter consisting of multiple fragments (33 visible) of white earthenware. Some fragments are crazed or covered in a web of cracks. Fragments appear to be part of a larger serving plate, possibly all from the same plate. One fragment has a partial makers mark that cannot be identified. Ferrous metal fragments from cans and other domestics are also present. Most are crushed and twisted beyond recognition but appear to be from sanitary cans. Two hole-in-cap lids found (base missing): Dimensions 1" cap 2 15/16" diameter top. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site. Therefore, this site is recommended as not eligible under CRHR under criteria 1–4 (FWPA, TN 250825, pages 50–51).

P-45-002025 – Terry Mill Railroad Logging System. The Terry Mill Railroad Logging System (P-45-002025) intersects the Study Area. It was first recorded by Coyote & Fox Enterprises in 1992. The resource record was updated by Caster Forestry Consultants in 1994, Charles Drew Dethero in 1995 and 1997, and Sierra Pacific Industries in 2003. The resource is an unpaved, dirt railroad grade comprising through-fills and through-cuts. The historic rails have been removed and most remaining ties have been removed or have rotted. Ballast remains undisturbed at select locations along the linear resource (FWPA, TN 250742, page 14).

After conducting historical research and evaluations guided by onsite data and previous research, the applicant has determined there is no indication of this site being associated with any person or entity or event important in the past. The site does not possess any distinctive historic design characteristics or methods of construction and the recordation of the site is noted as having exhausted the data potential for the site.

Therefore, this site is recommended as not eligible under CRHR under criteria 1 through 4 (FWPA, TN 250825, pages 44–45).

P-45-002939 - PG&E Pit 1 Vaca-Dixon 230 kV and PG&E Pit-Vaca Dixon No. 2 Transmission Lines. PG&E's Pit 1 Vaca-Dixon 230-kV and Pit-Vaca Dixon No. 2 transmission lines extend in an east–west direction near the center of the Study Area. The two transmission line segments run parallel to one another within an approximately 150-foot-wide right-of-way. The right-of-way is generally clear of trees and dense vegetation. There are a total of 94 transmission towers along a 4-mile segment within the Study Area, 47 towers on each line. The Pit 1 Vaca-Dixon 230-kV transmission towers are single-circuit, lattice steel, A-frame suspension snow towers, about 68 feet tall. The Pit-Vaca Dixon No. 2 transmission towers are single-circuit, lattice steel, H-frame suspension towers, somewhere around 40–45 feet tall. Both sets of transmission towers carry three metal cables (FWPA, TN 250742, page 7).

In 2017, JRP Historical Consulting, LLC, determined the Pit 1 Vaca-Dixon 230-kV Transmission Line individually eligible for the NRHP and CRHR, and as a contributor to the Pit 1 Hydroelectric Plant Historic District. JRP did not formally evaluate Pit-Vaca Dixon No. 2 as part of the Pit 1 Vaca-Dixon 230-kV Transmission Line; however, they did recommend it eligible for the NRHP under criterion A and C as part of the integrated transmission system developed to transmit electricity from the Pit 1 Powerhouse. Based on JRP's findings, Stantec on behalf of the applicant recommends the Pit-Vaca Dixon No. 2 as a CRHR-eligible historical resource (FWPA, TN 250742, pages 15–16).

California State Route 299 New and Decommissioned Segments. Today's SR 299 extends in an east-west direction at the north end of the PAA. At this location, the highway is a curvilinear, two-lane, asphalt-paved road roughly 30 feet wide with narrow, asphalt or unpaved, dirt shoulders. Select segments at the west end of the Study Area have steel guardrails along one or both shoulders. Metal postmile markers are periodically placed along the shoulder. There are three exits within the PAA to adjoining secondary roads. Exits are paved with asphalt within the public right-of-way. All existing features—pavement, guardrails, and postmile markers—are modern replacements installed at an unknown date.

Within the PAA there are three segments of SR 299 that have been previously decommissioned or removed from service as part of the state highway system and are no longer in use—the westernmost segment, center segment, and easternmost segment. The three segments vary in condition. The westernmost segment is roughly 16 feet wide and appears to be partially paved with asphalt. The remainder appears to be native, dirt surface. The center segment has been highly modified. It has a native, dirt surface, and the grade has been widened. Finally, the easternmost segment is approximately 20 feet wide and appears to be partially paved (FWPA, TN 250742, page 5).

Detailed and extensive evaluation of this resource by Stantec staff, after conducting in-depth historical research guided by onsite data and previous research, recommends that this resource does not rise to a level of significance to qualify as eligible under CRHR criteria 1–4. These evaluations are confined to only those SR 299 segments within the PAA (FWPA, TN 250825, pages 15–17).

Hatchet Mountain Area Logging Roads. Logging roads extend across the entire PAA. They consist of a graded surface ranging between 10 and 20 feet wide. Some roads have gravel paving, while others retain a native, dirt surface. Portions of these logging roads have become completely overgrown with vegetation and are currently impassible. Access gates—metal pipe swing gates between two metal poles—are periodically located throughout. One culvert was identified during the field inspection. It is located along the north fork of Montgomery Creek and consists of a buried concrete pipe topped by a metal guard rail (FWPA, TN 250742, page 6). Detailed and extensive evaluation of this resource by Stantec staff, after conducting in-depth historical research guided by onsite data and previous research, recommends that Hatchet Mountain Area Logging Roads do not rise to a level of significance to qualify as eligible under CRHR criteria 1 through 4. These evaluations are confined only to those Hatchet Mountain area logging roads within the PAA (FWPA, TN 250825, pages 17–19).

Hatchet Ridge-Bunchgrass Mountain. Hatchet Ridge-Bunchgrass Mountain, a historical resource important to the Pit River Tribe, is situated about 1 mile from the project area, in the CEC staff's ethnographic PAA. In 2007, the County of Shasta determined that Hatchet Ridge-Bunchgrass Mountain is a historical resource for the purposes of CEQA (see Cal. Code Regs., tit. 14, § 15064.5(a)). The County further determined that the Hatchet Ridge Wind Project would have a significant and unavoidable impact on Hatchet Ridge-Bunchgrass Mountain. This historical resource serves as a boundary marker between the Itsatawi and Madesi bands of the Pit River Tribe. The ridge and mountain also host trails, hunting grounds, ancestral burials, and ceremonial areas. (Shasta County 2007, page 3.5-10; Shasta County 2008)

Montgomery-Hatchet Creek Tribal Cultural Landscape

The Pit River Tribe has communicated to CEC staff that numerous tribal cultural resources are in and around the project site and leasehold. Considering the distribution of these individual resources and the Pit River Tribe's deep connection to the land, these tribal cultural resources form a tribal cultural landscape encompassing and surrounding the proposed project. The CEC staff provisionally refers to this area as the Montgomery-Hatchet Creek Tribal Cultural Landscape, which is in the ancestral territories of the Atsuge, Itsatawi, and Madesi bands of the Pit River Tribe, as well as Yana ancestral land. This tribal cultural landscape follows the drainages of Hatchet and Montgomery creeks, as well as their tributary streams. These waterways drain the uplands formed by Hatchet Mountain Ridge to the northeast of the project and a series of mountains proceeding south from the ridge and swinging westward to Tolladay Peak, southwest of the project area. These streams water the land between the Pit River and

Burney Creek drainages, supporting much wildlife and plants useful to Achumawi, Atsugewi, Yana, and their descendants. The mountain peaks—Round Mountain, Fuller Mountain, Carberry Mountain, Ward Butte, Green Mountain, Snow Mountain, Lookout Mountain, and Tolladay Peak—enclose the area, giving the tribal cultural landscape a sense of boundedness while still allowing for sweeping views to the most prominent topographic features for miles around, namely Lassen Peak and Mount Shasta.

The cultural environment shapes the Montgomery-Hatchet Creek Tribal Cultural Landscape Abundant in concert with the natural features identified in the previous paragraph. Abundant information about tribal cultural resources and uses of the proposed project area can be found in the writings of cultural anthropologists, proceedings of projects such as the Pit River hydroelectric development and Hatchet Ridge Wind Project, and testimony provided by current tribal members (Garth 1978, page 243, Figure 1; Johnson 1978, pages 368–369, Figure 1; Kroeber 1961; Olmsted and Stewart 1978, page 235, Figure 1; Tiley 2007). The Montgomery-Hatchet Creek Tribal Cultural Landscape meets CEQA's criteria for a tribal cultural resource, as determined by a lead agency (CEC) and supported by substantial evidence.

According to members of the Pit River Tribe, the tribal cultural landscape includes resources (biological, cultural, and topographical) that are significant to the tribe, such as trails, creeks, fish, medicinal plants, wildlife corridors, hunting grounds, ancestral cemeteries, power places, resting places, settlements, and mountain peaks. All these features of a cultural landscape coalesce in the drainages of Hatchet and Montgomery creeks where the applicant proposes to build. Modern tribal communities retain their lengthy and intimate connection to this place and affirm continuity of use today.

The 2020 DEIR (Cultural and Tribal Cultural Resources Section) identifies an archaeological site (FW-11) in the project footprint that contains artifacts of both Native American and non-Indian, historic-period manufacture. The DEIR finds FW-11 to qualify as a tribal cultural resource under CEQA. Impacts to FW-11 could be significant under CEQA and require mitigation measures. Other Native American archaeological resources have been identified in the proposed project site as well, including six stone artifacts that appear to be hunting tools (see Table 5.4-3 above).

The Pit River Tribe notes that natural and cultural resources are indistinguishable from the Pit River peoples and are a central element of the spirituality, traditional ceremonial practices, religious expressions, history, and identity of the Tribe and tribal members. Tribal members explain that the Tribe and its nation have deep ties to the area, which they describe as a place of refuge, ceremony, healing, prayer, fasting, hunting, gathering, and other sacred traditional uses. Tribal members indicate that burial grounds are in the project site. Tribal members expressed concern that the construction, operation, and maintenance of the project would infringe on the freedom of religion and the cultural practices of the Pit River Tribe and other California Native American tribes in the region and that the project would adversely affect sacred sites, traditional plants, and the viewshed of mountains held sacred by the Tribe.

P-45-002869. P-45-002869 is a previously identified site, a light-density lithic scatter, that was revisited during the 2018 survey. Modifications to the proposed project resulted in the feature being located outside of the original survey area, therefore the resource is not evaluated here (FWPA, TN 250825, page 42).

FW-11. This multicomponent site consists of a lithic scatter and historic logging artifacts. The Native American component contains stone tools and may be a tool manufacturing site. Although no archaeological excavation was conducted at this site, the presence of a variety of lithics and tools at the site indicates that there is a possibility to yield additional information in prehistory beyond the existing documentation of the site. Based on these observations, the applicant found the site eligible under CRHR under Criterion 4 for its research potential; CRHR criteria 1–3 do not contribute to FW-11's significance (FWPA, TN 250825, page 42). This site is considered a contributor to the Montgomery-Hatchet Creek Tribal Cultural Landscape because the lithic scatter is evidence of tool making and inferring hunting or gathering activities in the area. Hunting and gathering areas were specifically identified as contributing to the tribal cultural landscape.

The CEC staff concludes that the Montgomery-Hatchet Creek Tribal Cultural Landscape qualifies as a tribal cultural resource for the purposes of CEQA. This tribal cultural resource possesses the characteristics of a cultural landscape, per Section 21074(a) of the Public Resources Code, in that it is a definable area hosting natural resources, cultural resources, and cultural uses important to the Pit River Tribe. The Montgomery-Hatchet Creek Tribal Cultural Landscape is the setting for ceremonies, social gatherings, hunting, medicinal plant tending and collection, travel, and residential living. That this locus of most—if not all—major aspects of traditional Achumawi, Atsugewi, and Yana lifeways stretches into the precolonial past and continues today renders the cultural landscape of transcendent significance to the Pit River Tribe. This close, lengthy cultural association with the Pit River Tribe and their ancestors qualifies the Montgomery-Hatchet Creek Tribal Cultural Landscape as meeting CRHR Criterion 1. In addition, the archaeological resources throughout the Montgomery-Hatchet Creek Tribal Cultural Landscape provide ample sources of information for native, ethnographic, and archaeological understandings of this cultural landscape (CRHR Criterion 4).

The Montgomery-Hatchet Creek Tribal Cultural Landscape retains a high degree of integrity of setting, one of the seven qualities, or aspects, that define a resource's overall integrity. Currently, the Montgomery-Hatchet Creek Tribal Cultural Landscape is set in a highly serene setting that is vastly removed from most major types of development, despite some power generation and transmission facilities that have already been built. The original topography, viewshed of surrounding ridges and peaks, vegetation, and natural features are intact, as are cultural traditions that dot the landscape. Commenters and Tribal members suggest that noise generated by the proposed project could disrupt bird and animal patterns, as well as human experiences in the area. Even a slightly higher vibration or ambient noise from project construction and operation can impact the setting of this secluded environment.

Lastly, in assessing the overall sensitivity of the PAA for tribal cultural resources, coordination with the Pit River Tribe during the Hatchet Ridge Project identified Hatchet Ridge–Bunchgrass Mountain, which is located outside the leasehold area, as a culturally significant site, particularly to the Itsatawi and Madesi bands, and possibly the Atsuge, whose traditional territories are separated by Hatchet Ridge. Hatchet Ridge–Bunchgrass Mountain figure importantly in the lives of the Pit River Tribe. For example:

- Hatchet Ridge (located in the ethnographic PAA) served as a major transportation corridor for the Pit River Tribe
- Bunchgrass Mountain (located outside of the ethnographic PAA) is used as basketry collection locality
- Wildlife that are traditionally important to the Pit River Tribe cross Hatchet Ridge or use it as a migration corridor
- Hatchet Ridge and Bunchgrass Mountain contain other types of sacred areas.

The CEC staff have determined that the following additional general geographic areas, landforms, locations, and places of significance are of cultural and tribal interest (Johnston and Budy 1982) and should also be considered when analyzing the overall sensitivity of the PAA.

Pit River Tribe

The Pit River Indians occupied a vast territory generally centered on the Pit River and its tributaries. Various and specific locations important to the tribe include the following:

- Streams, lakes, meadows, and swamps were especially important to the Pit River Indians, providing a large portion of their food and shelter. Streams provided salmon, bass, catfish, lamprey, pike, suckers, trout, minnows, crawfish, and mussels. Swamps provided waterfowl, roots and tule fiber. Meadows were important sources of Epos and other roots, grass seeds, sunflower seeds, and insects
- Oaks provided acorns, and pine forests, juniper and sagebrush areas were used for hunting deer, elk, antelope, mountain sheep, rabbits, and other small game

Historic and current resource locations that include the above are found within the PAA, and the proposed project would be visible from many of these places.

The Yana

The Yana formerly occupied the area between the Sacramento River on the west, the Pit River on the north, Chico Creek on the south and a line of peaks of the southern Cascades on the East, including Lassen Peak, Crater Peak, Magee Peak, and Burney Butte. Harrington includes Hatchet Creek as Yana hunting territory. It is likely that the region between Hatchet Creek and northward to the Pit River was jointly used, if intermittently, by the Yana, Achumawi, and possibly the Atsugewi. This area also figures prominently in the Yana myths. Mythic places and places where mythic

creatures dwelt, various good luck places, and power places are also located within the PAA and vicinity.

Historic and current resource locations that include the above are found within the PAA, and the project as proposed would be visible to many of these places.

In summary, a wide variety of potentially sensitive, significant, and both recorded and unrecorded tribal cultural resources are within the PAA. Therefore, CEC staff concludes that the PAA is highly sensitive for tribal cultural resources.

Archaeological Sensitivity

The area is sensitive for the presence of both Native American and historic sites and artifacts and ground-disturbing, project-related activities have the potential to uncover buried deposits of cultural resources, based on the applicant's current technical study and research. The sensitivity for the presence of buried sites will vary across the PAA based on the geology and soils. It may be assumed, however, that the ecological settings of previously and newly recorded sites reflect the type of geologic and soil conditions that would be sensitive for the presence of buried cultural resources. For purposes of planning and project design, these types of environmental settings (i.e., locations of previously and newly recorded sites) should be considered sensitive for the presence of buried cultural and tribal resources (FWPA, TN 250825, page 24).

More specifically, although the applicant has identified various areas of tribal interest, previous cultural reports containing information relevant to the PAA have documented numerous additional tribal areas of significance or interest. Please review the discussion above regarding the Tribal Cultural Landscape for more detail.

In summary, a wide variety of potentially sensitive, significant, and both recorded and unrecorded tribal resources that include an archaeological component, and Native American and historic archaeological resources are within the PAA. Therefore, CEC staff concludes that the PAA is highly sensitive for archaeological and tribal cultural resources.

Regulatory

Federal

No federal regulations related to cultural and cultural resources apply to the project.

State

California Environmental Quality Act. Various laws apply to the evaluation and treatment of cultural resources. CEQA requires lead agencies to evaluate cultural resources by determining whether these evaluations meet sets of specified criteria that make such resources eligible to the CRHR. Those cultural resources eligible to the CRHR are historical resources. The evaluation then influences the analysis of potential impacts

to such historical resources and the mitigation that may be required to reduce any such impacts.

CEQA and the CEQA Guidelines define significant cultural resources under two regulatory definitions: historical resources and unique archaeological resources. A historical resource is defined as a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources", or "a resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code," or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record." (Cal. Code Regs., tit. 14, § 15064.5[a]). Historical resources that are automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the NRHP and California Registered Historical Landmarks from No. 770 onward (Pub. Resources Code, § 5024.1(d)).

Under CEQA, a resource is generally considered historically significant if it meets the criteria for listing in the CRHR. In addition to being at least 50 years old, a resource must meet one or more of the following four criteria (Pub. Resources Code, § 5024.1):

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Criterion 2, is associated with the lives of persons important in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important in prehistory or history.

In addition, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (Cal. Code Regs., tit. 14, § 4852(c)).

Even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA requires the lead agency to decide whether the resource is a historical resource as defined in Public Resources Code, sections 5020.1(j) or 5024.1.

In addition to historical resources, archaeological artifacts, objects, or sites can meet CEQA's definition of a unique archaeological resource, even if the resource does not qualify as a historical resource (Cal. Code Regs., tit. 14, § 15064.5(c)(3)). Archaeological artifacts, objects, or sites are considered unique archaeological resources

if it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that the resource meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person. (Pub. Resources Code, § 21083.2[g])

To determine whether a proposed project may have a significant effect on the environment, staff analyzes the project's potential to cause a substantial adverse change in the significance of historical or unique archaeological resources. The magnitude of an impact depends on:

- the affected historical resource(s);
- the specific historic significances of any potentially impacted historical resource(s);
- how the historical resource(s) significance is manifested physically and perceptually;
- appraisals of those aspects of any historical resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- how much the impact will change historical resource integrity appraisals.

Title 14, California Code of Regulations, section 15064.5(b) defines a "substantial adverse change" as the "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

California Native American Tribes, Lead Agency Tribal Consultation Responsibilities, and Tribal Cultural Resources

CEQA defines what constitutes a California Native American tribe for the purposes of the act, lead agency responsibilities to consult with California Native American tribes, and tribal cultural resources. Assembly Bill 52 established a formal role for California Native American tribes in the CEQA process. If consultation is requested, CEQA lead agencies are required to consult with tribes about potential tribal cultural resources, a recognized category of "historical resources" within the Survey Area and immediately surrounding area, the potential significance of project impacts, the development of project alternatives, and the type of environmental document that should be prepared.

A "California Native American tribe" is a "Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (NAHC) for the purposes of Chapter 905 of the Statutes of 2004" (Pub. Resources Code, § 21073). Lead agencies implementing CEQA are responsible for consultation with

California Native American tribes about tribal cultural resources within specific timeframes, observant of tribal confidentiality, and if tribal cultural resources could be impacted by a CEQA project, are to exhaust the consultation to points of agreement or termination.

Tribal cultural resources are either of the following:

4. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
   a. Included or determined to be eligible for inclusion in the CRHR
   b. Included in a local register of historical resources as defined in the Public Resources Code, section 5020.1(k)
5. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in the Public Resources Code, section 5024.1(c). In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe. (Pub. Resources Code, § 21074(a)).

To qualify as a tribal cultural resource, a resource must be: 1) listed on or eligible for listing on the CRHR or a local historic register, or 2) a resource that the lead agency, at its discretion and supported by substantial evidence, determines should be treated as a TCR (Pub. Resources Code § 21074). Tribal cultural resources include "non-unique archaeological resources" that, instead of being important for "scientific" value as a resource, can also be significant because of the sacred and/or cultural tribal value of the resource. Tribal representatives are considered experts appropriate for providing substantial evidence regarding the locations, types, and significance of Tribal cultural resources within their traditionally and cultural affiliated geographic area (Pub. Resources Code § 21080.3.1(a)). A cultural landscape that meets the criteria of Public Resources Code, section 21074(a), is a tribal cultural resource to the extent that the landscape is geographically defined in terms of its size and scope (Pub. Resources Code, § 21074(b)). Historical resources, unique archaeological resources, and non-unique archaeological resources, as defined at Public Resources Code, sections 21084.1, 21083.2(g), and 21083.2(h), may also be tribal cultural resources if they conform to the criteria of Public Resources Code, section 21074(a).

CEQA also states that a project with an impact that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code, § 21084.2).

Local

Shasta County. Shasta County does not have a local historic preservation ordinance or landmark designation program nor does the county maintain a local historic register. However, the Shasta County General Plan does include goals and policies related to the protection of cultural resources, which states:

6.10.3 Objective HER-1: Protection of significant prehistoric and historic cultural resources.

6.10.4 Policy HER-a: Development projects in areas of known heritage value shall be designed to minimize degradation of these resources. Where conflicts are unavoidable, mitigation measures which reduce such impacts shall be implemented. Possible mitigation measures may include clustering, buffer or non-disturbance zones, and building siting requirements.

Cumulative

Preparation of the cumulative impact analysis is required under CEQA. In the CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (Cal. Code Regs., tit. 14, § 15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects, is "cumulatively considerable," and therefore potentially significant (Cal. Code Regs., tit. 14, § 15130(a)(2)). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (Cal. Code Regs., tit. 14, § 15164(b)(1)).

Applicable cumulative projects consist of projects that are reasonably foreseeable and would be constructed or operated during the life of the proposed project. Cumulative projects include land development or public works projects that are planned or approved and, given their physical proximity to the project area or an overlap in the transportation routes used during construction, could potentially contribute to the same environmental effects as the proposed project.

For the purposes of this cumulative impact analysis, **Figure 1-1** in **Appendix 1,** shows 10 projects within the County that are located within an approximately 15-mile radius closest to the Project Site where there is the potential for impacts related to cultural or tribal cultural resources to combine with those of the Proposed Project: This geographic scope of analysis is appropriate because the archaeological resources within this area are expected to be similar to those that occur on the Project Site. Their proximity and similarity in environments would result in similar land-use, and thus, site types. Cumulative impacts could occur if other projects, in conjunction with the proposed project, would have impacts on cultural or tribal cultural resources that, when considered together, would be significant.

Numerous potential cumulative impact projects have been identified. Only those in the in the immediate vicinity, or within 15 miles of the Fountain Wind cultural PAA are discussed herein. This includes:

- Fern Road East and Glendenning Creek Bridge
- Round Mountain 500 kV Area Dynamic Reactive Support Project
- Diddy Roost Culverts

- Ingot Curve Improvement
- Fenders Ferry Culverts
- Potato Cut
- Nelson Creek Road at Nelson Creek Bridge
- Hatchet Ridge Wind
- The Burney CAPM Project
- Crossroads 2

5.4.2 Environmental Impacts

This section describes the environmental setting and regulatory background and discusses the impacts associated with the construction and operation of the proposed project with respect to cultural and tribal cultural resources.

CULTURAL AND TRIBAL CULTURAL RESOURCES Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐	☐	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

TRIBAL CULTURAL RESOURCES Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
d. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
e. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code	☒	☐	☐	☐

TRIBAL CULTURAL RESOURCES Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, cultural resources and tribal cultural resources Environmental checklist established by CEQA Guidelines, Appendix G.

5.4.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following thresholds of significance to evaluate the project.

Thresholds of Significance

The significance criteria listed below are used to determine whether a project or alternatives would result in significant impacts under CEQA related to cultural resources. These criteria are also from CEQA Appendix G. Under CEQA, the Proposed Project would cause a significant impact if it caused a substantial adverse change in the significance of a historical resource, an archeological resource, or a tribal cultural resource as defined under the California Code of Regulations, Title 14, Chapter 3, Section 15064.5.

The Proposed Project would have a significant impact on these cultural resources if it would:

- Physically alter, damage, or cause destruction of all or a part of a historical or archaeological resource
- Demolish or materially alter in an adverse manner those physical characteristics of a historical resource that convey its significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources, inclusion in a local register of historical resources, or its determination to be a historical resource by a CEQA lead agency
- Demolish or materially alter in an adverse manner those physical characteristics of an archaeological artifact, site, or object that enable it to meet the definition of a unique archaeological resource under CEQA
- Disturb any human remains, including those interred outside of formal cemeteries

5.4.2.2 Direct and Indirect Impacts

Criteria for determining if a proposed project will have a significant impact on an identified historical resource is whether the project will alter the physical integrity of the historical resource in an adverse manner such that it would no longer be eligible to the NRHP, the CRHR, or any other local landmark programs (FWPA, TN 250742, page 9).

Direct and indirect impacts to significant historical resources are considered herein as follows.

- Direct or primary impacts are caused by the project and occur at the same time and place (14 Cal. Code Regs. § 15358 [a][1])
- Indirect impacts, or secondary effects, are reasonably foreseeable and caused by a project but occur at a different time or place (14 Cal. Code Regs. § 15358 [a][2])

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Public Resources Code, section 15064.5?

Construction

Less Than Significant for the **Pit-Vaca Dixon No. 2** and **Pit 1 Vaca-Dixon 230 kV transmission lines**. *Less Than Significant with Mitigation* for archaeological resources, **P-45-001988/P-45-001989** and **FW 11.** *Significant and Unavoidable Impact* for **Hatchet Ridge-Bunchgrass Mountain***.* Two known historic built environment resources meeting CEQA's criteria for historical resources are in the PAA, which are the **Pit-Vaca Dixon No. 2** and **Pit 1 Vaca-Dixon 230 kV transmission lines**. The proposed project would directly impact the **Pit-Vaca Dixon No. 2** and indirectly impact both historical resources. Additionally, two known archaeological resources, **P-45-001988/P-45-001989** and **FW 11**, meeting CEQA's criteria for historical resources are in the PAA and would be directly impacted by the proposed project. **Hatchet Ridge-Bunchgrass Mountain**, which the County determined is a historical resource under CEQA, is also located within the ethnographic PAA for the proposed project.

As part of the project, an existing **Pit-Vaca Dixon No. 2** transmission tower would be removed and replaced with four tubular steel poles (TSPs) up to 125 feet tall and an aboveground line tap would also be installed on the existing transmission line.

The applicant concludes that the **Pit-Vaca Dixon No. 2** would be altered in compliance with the Secretary of the Interior's Standards and would retain sufficient integrity to convey its historic significance (FWPA, TN 250742, page 21). The CEC staff concurs with this conclusion. The project would not affect the historical resource's integrity of location. The project would replace an existing transmission tower with four TSPs, constituting only approximately 0.1 percent of the historical resource's total length; therefore, the historical resource's integrity of design, materials, workmanship,

and feeling would be preserved overall. Integrity of association would be unchanged because the Project would not impact the resource's use or its ability to convey its significant association with electrical power transmission in California. The project would introduce new visual features within the setting of the historical resource; however, the new TSPs are unobtrusive when compared to the roughly 60-mile-long transmission line and would be minimally visible or completely imperceptible from most locations along the resource. The historical resource would ultimately retain all aspects of integrity. Therefore, the project would result in a less than significant direct impact on the **Pit-Vaca Dixon No. 2 transmission line**.

The project will also indirectly impact the **Pit-Vaca Dixon No. 2** and **Pit 1 Vaca-Dixon 230 kV transmission lines** by introducing new construction elements within the PG&E right-of-way, which includes widening three existing access roads, digging a 12-inch-wide trench to install an underground collector system, installing 90-foot-tall wood poles for the overhead collector system, and vegetation clearance around the overhead and underground collector systems. Adjacent to the new construction outside the PG&E right-of-way includes the construction of a new substation and switching station, installation of wind turbines, and other related equipment (FWPA, TN 250742, page 20), all of which have the potential to impact the integrity of both resources.

As the nearby new construction would not modify the physical characteristics of either historical resource, the sole relevant aspect of integrity concerning the impact of a new visual element is the setting. Setting encompasses the nature of the place where the historical resource is located within the property. It also encompasses the resource's connection to its broader surroundings, including other buildings, landscapes, and open spaces. The project is set to modify existing features within the setting of the two historical resources, particularly access roads, and it will introduce new visual elements within and adjacent to the resources' boundaries, such as an overhead collector system intersecting the PG&E right-of-way, a substation, a switching station, wind turbines, and associated equipment. Unrelated to the Project, changes in the setting of both historical resources have already occurred like new residential, commercial, and agricultural development, the construction of new roads and bridges across the PG&E right-of-way, and the installation of related new equipment, such as TSPs along the **Pit-Vaca Dixon No. 2** (FWPA, TN 250742, pages 23). Thus, the overall setting of the two historical resources has previously changed without adversely affecting the overall integrity of the resources.

Moreover, the project would have no impact on the broader setting along the 202-mile-long **Pit 1 Vaca-Dixon 230 kV Transmission Line** and the 60-mile-long **Pit-Vaca Dixon No. 2**. Beyond the Study Area, the overall ambiance of the historical resources would persist, characterized by the surrounding rural and semi-rural landscape. Therefore, the project would result in a less than significant indirect impact on the **Pit-Vaca Dixon No. 2** and **Pit 1 Vaca-Dixon 230 kV transmission lines**.

Two archaeological resources meeting CEQA's criteria for historical resources are in the PAA and will be directly impacted. Both resources, **P-45-001988/P-45-001989** and **FW 11**, are eligible for the CRHR under Criterion 4, for their potential to yield additional information important in prehistory or history. The proposed project would cause significant impacts on these resources without mitigation.

Lastly, ground disturbance extending into native soils and removal of surface duff, dense brush, and ground cover during construction, including trenching for utilities, road construction, drainage facilities, or electrical connections, could impact unknown surface and buried historical resources. The CEC staff proposes, therefore, mitigation measures requiring worker awareness program and monitoring by qualified archaeologists and Native American monitors (Condition of Certification [COC] **CUL-1**), subsurface testing focusing on P-45-001988/P-45-001989 and FW 11 (COC **CUL-2**), procedures for the event that Native American or historic resources are encountered during excavation or grading of the site (COC **CUL-3**), and procedures for the event that human remains are discovered (COC **CUL-4**) to reduce impacts to buried historical resources. Staff concludes that with implementation of COCs **CUL-1** through **CUL-4,** impacts to known and buried historical resources would be reduced to a less than significant level.

Hatchet Ridge-Bunchgrass Mountain is a historical resource under CEQA and exhibits numerous cultural values for the Pit River Tribe. Although the applicant has not proposed development on **Hatchet Ridge-Bunchgrass Mountain** itself, this historical resource in the project's ethnographic PAA because it is less than 1 mile from the proposed project with clear views to and from **Hatchet Ridge-Bunchgrass Mountain**. The historical resource draws its significance in part from the ceremonial areas located on the ridge and mountain. The Tribe's ceremonial practices depend upon wide, tranquil, natural vistas from specific elevated positions along the ridge and mountain. One string of wind turbines already occupies a portion of **Hatchet Ridge-Bunchgrass Mountain**, although the addition of up to 48 new and larger wind turbines within this historical resource's southern and southwestern vistas would spoil these remaining viewsheds for ceremonial purposes. This impact would be significant and unavoidable because there is no way to hide wind turbines of the size proposed for the Fountain Wind Project.

Operation

Significant and Unavoidable Impact. Ground-disturbing activities do not appear to be part of the standard operational or maintenance profile of the proposed project. Impacts on historical resources of an archaeological or historic built environment nature are therefore not expectable during normal operation and maintenance. The operation of the proposed project would continue to spoil the vistas identified in the previous paragraph for the life of the project. As with the construction-phase impact, the operational impact would be significant and unavoidable, and for the same reasons already mentioned.

b. Would the project cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Public Resources Code, section 15064.5?

Construction

Less Than Significant with Mitigation Incorporated. See the response to CEQA checklist criterion "a*"* above, which includes a discussion of historical resources of an archaeological nature. Implementation of COCs **CUL-1–CUL-4** would reduce impacts to unknown buried, unique archaeological resources to a less than significant level.

Operation

No Impact. Ground-disturbing activities do not appear to be part of the standard operational or maintenance profile of the proposed project. Impacts on unique archaeological resources are therefore not expectable during normal operation and maintenance.

c. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Construction

Less Than Significant with Mitigation Incorporated. See the response to CEQA checklist criterion "a" above, which includes a discussion of historical and unique archaeological resources (both of which can include human remains). Additionally, as discussed in the Environmental Setting section above, no know human remains or burial grounds have been identified within the PAA. However, coordination with the Pit River Tribe identified several potential tribal cultural resources, which include unknown ancestral burial grounds, that may be located within or near the Project Site (Stantec 2020a).

Due to the sensitive nature of the Project Site, it is possible that the ground disturbance proposed for construction could impact unknown human remains, which would constitute a significant impact without mitigation. Therefore, COCs **CUL-1** through **CUL-4** are recommended and with implementation would reduce impacts to unknown buried, human remains to a less than significant level.

Operation

No Impact. Ground-disturbing activities do not appear to be part of the standard operational profile of the proposed project. Impacts on human remains are therefore not expectable during normal operation and maintenance.

d. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code, section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code, section 5020.1(k), or

Construction

No Impact. There are no tribal cultural resources listed or eligible for listing in the CRHR or other state registers, NRHP, or local register of historical resources in the PAA. Therefore, no impacts would occur during construction tribal cultural resources already listed or eligible for listing in the CRHR or other state registers, NRHP, or local register of historical resources.

Operation

No Impact. Ground-disturbing activities are not part of the standard operational profile of the proposed project. Impacts on tribal cultural resources listed or eligible for listing in the CRHR or other state registers, NRHP, or local register of historical resources would therefore not occur during operation or maintenance as no resources meeting the criteria have been identified.

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code, section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code, section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Construction

Significant and Unavoidable Impact. One significant tribal cultural resource has been identified in and surrounding the PAA, described above as the **Montgomery-Hatchet Creek Tribal Cultural Landscape**. The proposed project plans to significantly grade the existing landscape, altering the natural topography, destroying site **FW 11** and six isolates identified as contributors to the **Tribal Cultural Landscape**, and erecting wind turbines that will drastically impact the viewshed to and from surrounding sacred mountains requiring isolation and tranquility, with sweeping natural vistas, to retain their historic integrity as contributors to the tribal cultural landscape. While the destruction of **FW 11** and six isolates may not lead to a potentially significant impact to

the **Tribal Cultural Landscape** on their own, the drastic alteration to the natural topography, obstruction of sweeping natural vistas, and the overall disturbance to the tranquility and isolation within and surrounding the PAA, all of which are identified as sacred to the local Pit River Tribe, coupled with the destruction of seven contributing cultural resources constitutes a significant impact to the **Tribal Cultural Resource**. The CEC staff have determined that implementation of COCs **CUL-1** through **CUL-4** will not reduce impacts to tribal cultural resources as defined in Public Resources Code, section 21074 to a less than significant level during construction.

Additionally, the CEC staff have determined that ground disturbance associated with the proposed project could result in the exposure and destruction of buried, as-yet unknown Native American archaeological resources that could qualify as tribal cultural resources. Ten Native American isolates including obsidian projectile points and flakes, and a basalt biface were identified during the cultural survey of the larger survey area where visibility due to duff, steep slopes, and other factors was less than ideal. In addition, multiple previous surveys within or in the vicinity of the PAA have identified low visibility as an issue. A 2005 timber harvesting survey notes that "Duff limits ground visibility in roughly 60% of unroaded areas" (Lindler 2005, page 131). Other surveys have also recommended the removal of duff to better define a cultural site. A 1992 reconnaissance survey for a timber sale notes, regarding an historic site, that "Additional field work is needed to accurately define the site boundary; and clearing of the dense duff layer is recommended to locate more artifacts" (Vaughan et al. 1992, page 6). Finally, a 1993 Caltrans survey report for a Highway 299 repair project documents the discovery of a "sparse scatter of obsidian debitage" after the 1992 Burney Fire which "burnt off much of the duff to expose cultural remains underneath" (Fung 1993, page 5).

In summary, multiple cultural reports, including the applicant's, have determined that archaeological sites are present under heavy layers of duff found throughout the PAA. The CEC staff have determined, therefore, that there is a high potential for the finding of unknown Native American archaeological resources eligible to the CRHR during construction that could also qualify as tribal cultural resources. Accordingly, the CEC staff proposes mitigation measures requiring worker awareness program and deployment of qualified archaeologists and Native American full-time monitors (COC **CUL-1**), procedures if unknown buried resources are encountered during excavation and/or grading (COC **CUL-3**), and procedures to follow in the event of a human remains discovery (COC **CUL-4**). With implementation of these mitigation measures, the proposed project would have a less than significant impact on unknown buried resources.

Operation

Significant and Unavoidable Impact. Ground-disturbing activities do not appear to be part of the standard maintenance profile of the proposed project. However, operation of the proposed wind turbines and their imposition on the landscape would present a

significant visual intrusion on the **Montgomery-Hatchet Creek Tribal Cultural Landscape**. Ongoing consultation with the Pit River Tribe suggests that the proposed project would cause noise, vibration, and other impacts during O&M to the identified **Montgomery-Hatchet Creek Tribal Cultural Landscape** and as-yet-unidentified tribal cultural resources. The CEC staff have determined that implementation of COCs **CUL-1** through **CUL-4** will not reduce impacts to tribal cultural resources, as defined in Public Resources Code, section 21074, to a less than significant level during operation of the proposed project.

5.4.2.3 Cumulative Impacts

Significant and Unavoidable Impact. The below conclusions regarding cumulative impacts are made assuming that the agencies or entities responsible for completing each of the above noted projects are conducting all required environmental studies in accordance with appropriate LORS.

- Fern Road East at Glendenning Creek Bridge. Shasta County Public Works, bridge repair, 13 miles south of the proposed project. Fern Road is outside of the project footprint. As such, Fern Road was not evaluated, although numerous other roads in the vicinity of the and within the PAA are regarded in the HRER as ubiquitous and not significant (FWPA, TN 250742, page 13). No cumulative impacts are anticipated.
- Round Mountain 500 kV Area Dynamic Reactive Support Project. CPUC Fern Road Substation improvements ultimately connecting to transmission lines adjacent to the proposed project, 15 miles southwest of project footprint. Impacts to the transmission lines adjacent to and connecting to the proposed project were evaluated and determined as not significant (FWPA, TN 250742, pages 20–24). No cumulative impacts are anticipated.
- Diddy Roost Culverts, Caltrans replacement of 26 culvert systems and upgrade 20 drainage inlets along SR 299 in Shasta County. SR 299 was evaluated in the Fountain Wind HRER as not eligible to the CRHR, and no cumulative impacts are anticipated (FWPA, TN 250742, pages 14–17).
- Ingot Curve Improvement, a Caltrans SR 299 project, 14 miles southwest of the Project Site, would widen shoulders, realign the highway for alignment consistency, increase sight distances, and create a clear recovery area on SR 299 near Ingot. SR 299 was evaluated in the Fountain Wind HRER as not eligible to the CRHR, and no cumulative impacts are anticipated.
- Fenders Ferry Culverts, Caltrans SR 299 culvert restoration project at six locations on SR 299. This highway was evaluated in the Fountain Wind HRER as not eligible to the CRHR, and no cumulative impacts are anticipated (FWPA, TN 250742, pages 14–17).
- Potato Cut, Caltrans SR 299 curve improvement project three miles west of the Project Site. SR 299 was evaluated in the Fountain Wind HRER as not eligible to the CRHR, and no cumulative impacts are anticipated (FWPA, TN 250742, pages 14–17).

- Nelson Creek Road at Nelson Creek Bridge. This is a Shasta County Public Works bridge replacement project. Nelson Creek Road is 14 miles north of the proposed project. Nelson Creek Road was not evaluated, although numerous other similar roads in the vicinity of and within the PAA are regarded in the HRER as ubiquitous and not significant (FWPA, TN 250742, page 13). No cumulative impacts are anticipated.
- Hatchet Ridge Wind. This project has been in operation since 2010. It is well outside of the project footprint. It is assumed that cultural impacts for this project were evaluated prior to 2010, although it is also understood that tribal input for the Fountain Wind Project has identified various potentially significant tribal cultural impacts combined with the Hatchet Wind Project. The proposed project would alter the landscape and would visually impact an identified tribal cultural resource. The proposed project combined with the existing Hatchet Ridge Wind Project would permanently alter the landscape and setting, thus significantly impacting an identified tribal cultural resource and contributing to significant cumulative impacts.
- The Burney CAPM Project consists of a Caltrans pavement rehabilitation project on SR 299. SR 299 was evaluated in the Fountain Wind HRER as not eligible to the CRHR (FWPA, TN 250742, page 14–17), and no cumulative impacts are anticipated.
- Crossroads 2. This CASIO project near Montgomery Creek is a 313 MW battery storage project with a projected size of 85 acres. PG&E is identified as the participating transmission owner. This project connects to the Round Mountain Substation described above as having no cumulative impact.

The project-specific impact would only contribute to a cumulative impact if the other cumulative projects impact significant cultural or tribal cultural resources. Due to the fact the existing Hatchet Ridge Wind Project has visually impacted a tribal cultural landscape, that impact combined with the proposed project's potentially significant impact on tribal cultural resources, it is therefore anticipated that the cumulative effect in relation to tribal cultural resources would remain significant and unavoidable.

5.4.3 Project Conformance with Applicable LORS

No federal regulations apply to this project, although various state and local laws, ordinances, and regulations (LORS) do apply to the project.

The CEC staff's determination of conformance with applicable LORS, including any proposed COCs, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would appear to be consistent with all applicable State but not local LORS (FWPA, TN 249533). The subsection below, "5.4.5 Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.4-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Federal	
The project has no federal nexus for cultural resources.	**N/A**
State of California	
The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (Pub. Resources Code § 5024.1[a]).	**Yes.** Yes. Implementation of COCs **CUL-1**, **CUL-2**, and **CUL-3** would ensure the project would stay consistent with this LORS goal throughout the life of the project.
Public Resources Code, section 5097.98 (reiterated in Cal. Code Regs., tit. 14, § 15064.5[e]) identifies steps to follow in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, including notification of the most likely descendent. Public Resources Code, section 5097.99 prohibits obtaining or possessing any Native American artifacts or human remains that are taken from a Native American grave or cairn (stone burial mound).	**Yes.** Implementation of COCs **CUL-1**, **CUL-2**, and **CUL-3** would ensure the project would stay consistent with this LORS goal throughout the life of the project.
Health and Safety Code, section 7050.5 protects human remains by prohibiting the disinterment, disturbance, or removal of human remains from any location other than a dedicated cemetery.	**Yes.** Implementation of COC **CUL-3** will ensure the project would stay consistent with this LORS goal throughout the life of the project.
Assembly Bill (AB) 52 added provisions to the Public Resources Code regarding the evaluation of impacts on tribal cultural resources under CEQA, and requirements to consult with California Native American tribes as defined in Government Code, section 65352.4.	**Yes.** The CEC staff is currently conducting tribal consultations in accordance with AB 52. The project will stay consistent with this LORS goal throughout the life of the project.
Local -Shasta County	
Shasta County General Plan. 6.10.3 Objective HER-1: Protection of significant prehistoric and historic cultural resources. 6.10.4 Policy HER-a: Development projects in areas of known heritage value shall be designed to minimize degradation of these resources. Where conflicts are unavoidable, mitigation measures which reduce such impacts shall be implemented. Possible mitigation measures may include clustering, buffer or non-disturbance zones, and building siting requirements.	**No.** The project would significantly impact an identified tribal cultural landscape that meets the definition of a tribal cultural resource under CEQA.

5.4.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, some project impacts would be less than significant but the project would continue to have a significant and unavoidable

impact related to tribal cultural resources and because of these impacts would not conform with the Shasta County General Plan.

5.4.5 Proposed Conditions of Certification

The following proposed COCs include measures to mitigate environmental impacts and ensure conformance with applicable LORS to the extent possible. However, even with implementation of the COCs, the project will have a significant and unavoidable impact on tribal cultural resources.

CUL-1 Prior to the commencement of construction, the applicant will secure the services of qualified archaeological specialists and Native American monitors. These specialists and monitors will prepare a training program for all construction personnel involved in ground disturbance. This program will be provided to all construction workers via a recorded or other presentation and will include a discussion of applicable laws and penalties under the laws; samples or visual aids of resources that could be encountered in the project vicinity; instructions regarding the need to halt work in the vicinity of any potential archaeological and Native American resources encountered; and measures to notify their supervisor, the applicant, and the specialists.

The applicant will secure the services of Native American monitors and archaeologist to observe excavations of native soil. Preference in selecting Native American monitors shall be given to Native Americans with:

1. Traditional ties to the area being monitored
2. Knowledge of local historic and prehistoric Native American tribal cultural resources
3. Knowledge and understanding of Health and Safety Code, section 7050.5, and Public Resources Code, section 5097.9 et seq.
4. Ability to effectively communicate the requirements of Health and Safety Code, section 7050.5, and Public Resources Code, section 5097.9 et seq.
5. Ability to work with law enforcement officials and the Native American Heritage Commission to ensure the return of all associated grave goods taken from a Native American grave during excavation
6. Ability to travel to project sites within traditional tribal territory
7. Knowledge and understanding of Title 14, California Code of Regulations, section 15064.5
8. Ability to advocate for the preservation in place of Native American cultural features through knowledge and understanding of CEQA mitigation provisions

9. Ability to read a topographical map and be able to locate site and reburial locations for future inclusions in the Native American Heritage Commission's Sacred Lands Inventory
10. Knowledge and understanding of archaeological practices, including the phases of archaeological investigation

The Applicant shall offer and provide the opportunity for cultural resource monitors from the Pit River Tribe to monitor initial ground disturbing construction activities in areas identified by the Tribe as culturally sensitive. Monitors will have the authority to ensure that discrete sacred sites in the Project Site are avoided or that impacts on such localities are mitigated to the extent feasible, including but not limited to, avoidance or data recovery. The Pit River Environmental Office should coordinate with the appropriate bands of the Pit River Tribe (Atsuge, Itsatawi, and Madesi) to assign monitors. If the offer is accepted by the Pit River Tribe, the Applicant shall provide compensation commensurate with market rates based on the qualifications and experience of the cultural monitor(s).

Verification: Prior to tendering an offer to the Tribe the Applicant shall provide a copy of the offer to the CEC's compliance project manager (CPM) for review, including the proposed number of monitors to be employed, proposed construction schedule/hours during which monitors would be present on site, proposed level(s) of compensation, and other relevant details of the proposed cultural monitoring program.

CUL-2 Prior to the issuance of grading permits, the project will be required to complete subsurface testing on sites FW 11 and P-45-001986/P-45-001988 to determine the resources CRHR eligibility under Criterion 4. Subsurface testing will include shovel test pits, or a combination of shovel test pits and excavation units. Subsurface testing shall be completed by a qualified archaeologist and Native American monitors. Based on the findings of the subsurface testing, an archaeological resources treatment plan shall be prepared by a qualified archaeologist in consultation with Native American monitors for those resources determined eligible under CRHR Criterion 4 and cannot be avoided by the project.

Verification: The treatment plan shall be submitted to the CEC's CPM and the Pit River Environmental Office for review and approval 90 days prior to the date on which the applicant wishes to begin archaeological excavations.

CUL-3 If California Native American or historic-era archaeological resources are encountered during Project implementation, either during monitoring or otherwise, all construction activities within 100 feet shall cease, and a qualified archaeological monitor and Native American Monitor shall inspect the find within 24 hours of discovery and notify the CEC's CPM of their initial assessment.

If the CPM determines, based on recommendations from archaeological and Native American monitors (if the resource is Native American related), that the resource may qualify as a historical resource or unique archaeological resource (as defined in Cal. Code Regs., tit. 14, § 15064.5) or a tribal cultural resource (as defined in Pub. Resources Code, § 21080.3), the resource shall be avoided if feasible. Consistent with the California Code of Regulations, title 14, section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement.

If avoidance is not feasible, the CPM shall consult the archaeological and Native American monitors (if the resource is Native American-related) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to Pub. Resources Code, section 21083.2, and the California Code of Regulations, title 14, section 15126.4. This shall include documentation of the resource and may include data recovery (according to Pub. Resources Code, § 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to Pub. Resources Code, § 21084.3).

The project applicant will ensure that construction personnel do not collect or move any cultural material and will ensure that any fill soils that may be used for construction purposes does not contain any archaeological materials.

Verification: The archaeological and Native American monitors shall provide their initial assessment of resource significance to the CPM within 48 hours of completing their initial assessment of the inadvertently discovered cultural or tribal cultural resource.

Construction within 100 feet of the inadvertent discovery cannot resume until all assessments and mitigation measures (if applicable) have been completed and the CPM expressly informs the applicant that construction may resume.

CUL-4 In the event human remains are uncovered during ground-disturbing activities (including construction, operations and maintenance, and decommissioning), the applicant or its contractor shall immediately halt work within a 100-foot radius, contact the Shasta County Coroner to evaluate the remains, and follow the procedures and protocols pursuant to the California Code of Regulations, title 14, section 15064.5(e)(1). The Health and Safety Code, section 7050.5, requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to the Public Resources Code, section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the most likely descendant of

the deceased Native American. The most likely descendant will make recommendations for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

Verification: The applicant shall immediately notify the coroner if suspected human remains are found during construction activities.

Within 48 hours of examining the remains, the coroner must determine whether an investigation of cause of death is required and whether the remains are Native American.

If the coroner determines that Native American human remains are present, they must contact the NAHC within 24 hours of the determination.

The NAHC-identified most likely descendant has a minimum of 48 hours from their inspection of the human remains to make recommendations for treatment as provided in Public Resources Code Section 5097.98.

5.4.6 References

Bailin and Grossman 1971 - *One of the Last Human Hunts of Civilization, and the Basest and Most Brutal of Them All.* Company and Sons, 1971.

CEC 2023m – California Energy Commission (TN 253026). Tribal Consultation Letters, dated November 7, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2024 – California Energy Commission (CEC). Tribal Consultation Policy. CEC-700-2022-001. Sacramento, CA, February 2024. Available online at: https://www.energy.ca.gov/sites/default/files/2022-02/CEC-700-2022-001.pdf

Constitution of the Pit River Tribe 2005 – ARTICLE II - Territory and Jurisdiction. National Indian Law Library. Available online at: https://narf.org/nill/constitutions/pit_river/pitriverconst.html

Cook 1976 – Sherburne F. Cook. *The Conflict between the California Indian and White Civilization*. Berkeley: University of California Press.

De Novo 2010 – Draft EIR for the Sierra Pacific Cogeneration Power Project. Prepared by De Novo Planning Group. Prepared for the Shasta County Department of Resource Management, Planning Division, Redding CA, 2010.

Enterprise-Record, Chico, California, September 25, 1970, Page 6.

Fresno Bee, Fresno, California, June 1, 1937, Page 11.

Fung 1993 – Teresa Fung. Archaeological Survey Report for the Highway 299 Structural Repair Project Near Burney, Shasta County, California, 02-Sha-299, P.M.

66.0/77.9, 02-29940K. Prepared for Caltrans District 2, Redding, California, October 1993. 20230627T141922_fwp_NEIC-002792. Confidential.

Garth 1978 – T. R. Garth. Atsugewi. In *California*, edited by Robert F. Heizer, pp. 236–243. Handbook of North American Indians, Vol. 8, edited by William C. Sturtevant. Washington, D.C.: Smithsonian Institution, 1978.

Johnson 1978 – Jerald J. Johnson. Yana. In *California*, edited by Robert F. Heizer, pp. 361–369. Handbook of North American Indians, Vol. 8, edited by William C. Sturtevant. Washington, D.C.: Smithsonian Institution, 1978.

Johnston and Budy 1982 – Cultural Resource Survey Management Overview, Lassen National Forest, Volume One, Cultural History, Prepared by James Johnston and Elizabeth Budy, 1982. Confidential.

KEA 2000 – Cultural Resources Inventory of the Pit 3, 4 and 5, Hydroelectric Relicensing Project, Shasta County, California: Pit 3, 4 And 5 River Reaches, Volume I. Prepared by Steve Heipel and Jackson Underwood, KEA Environmental Inc., Sacramento, California. Prepared for Pacific Gas and Electric Company, San Franciso, California. fwp_NEIC-003368. Confidential.

Kroeber 1961 – Theodora Kroeber. *Ishi in Two Worlds: A Biography of the Last Wild Indian in North America*. Berkeley: University of California Press, 1961.

Lindler 2005 – An Archaeological Survey Report for the Hatchet Timber Harvesting Plan, Shasta County, California. Prepared by Dustin Lindler. Berryman & Associates, Weed, California. 20230627T144610_fwp_NEIC-006494. Confidential.

McGuire 2007 – Kelly R. McGuire. Models Made of Glass: A Prehistory of Northeast California. In *California Prehistory, Colonization, Culture, and Complexity*, edited by Terry Jones and Kathryn A. Klar, pp. 165–176 Alta Mira Press, 2007.

Mengers and Eckhardt 2022 – Cultural Resource Technical Report for the Round Mountain 500kV Area Dynamic Reactive Support Project. Prepared by Douglas W. Mengers and William T. Eckhardt. Prepared for the California Public Utilities Commission. PanGIS, San Diego, CA. Confidential.

Oakland Tribune, Oakland, California, July 23, 1921, Page 3.

OHP 1995 – Office of Historic Preservation (OHP). *Instructions for Recording Historical Resources*. Sacramento, CA: Office of Historic Preservation, March 1995.

Olmsted and Stewart 1978 – D. L. Olmsted and Omer C. Stewart. Achumawi. In *California*, edited by Robert F. Heizer, pp. 225–235. Handbook of North American Indians, Vol. 8, edited by William C. Sturtevant. Washington, D.C.: Smithsonian Institution, 1978.

Rawls 1984 – James J. Rawls (Rawls). *Indians of California: The Changing Image*. Norman: University of Oklahoma Press, 1984.

San Francisco Bulletin, San Francisco, California, April 15, 1921, Page 14.

Secrest 2003 – William B. Secrest (Secrest). *When the Great Spirit Died: The Destruction of the California Indians, 1850–1860*. Sanger, CA: Word Dancer Press, 2003.

Shasta County 2007 – Shasta County Department of Resource Management. *Draft Environmental Impact Report for the Hatchet Ridge Wind Project*. Redding, CA, December 2007. Accessed online on October 27, 2023 at: https://www.shastacounty.gov/planning/page/draft-environmental-impact-report-hatchet-ridge-wind-project

Shasta County 2008 – Shasta County Department of Resource Management. Final Environmental Impact Report for the Hatchet Ridge Wind Project. Redding, CA, June 2008. Accessed online on October 27, 2023 at: https://www.shastacounty.gov/planning/page/final-environmental-impact-report-hatchet-ridge-wind-project

Shasta Courier 1868 – *Shasta Courier* (Shasta, CA), "Road to Fort Crook," March 7, 1868, page 2.

Shipley 1978 – William F. Shipley. "Native Languages of California." In *California*, edited by Robert F. Heizer, pp. 80–90. Handbook of North American Indians, Vol. 8, edited by William C. Sturtevant. Washington, D.C.: Smithsonian Institution, 1978.

Siskiyou Daily News, Yreka, California, September 30, 1920, Page 11.

Stantec 2020a – Stantec Consulting Services Inc. Fountain Wind Energy Project, DEIR Cultural And Tribal Cultural Resources (TN 248288-8). Prepared by Stantec Consulting Services Inc., July 2020. Docket Number 23-OPT-01, Docketed Date 1/3/2023.

Stantec 2023a – Stantec Consulting Services Inc. Fountain Wind Energy Project Historical Resources Evaluation Report (TN250742_20230626T142805). Prepared by Rebecca Riggs et al., Sacramento, CA, Prepared for Fountain Wind LLC, Houston, TX, June 16, 2023. Docket Number 23-OPT-01, Docketed Date 6/26/2023. Confidential.

Tiley 2007 – Shelly Tiley. *Consultations with the Pit River Tribe, Hatchet Ridge Wind Project*. Prepared for Jones and Stokes Associates, Inc., Sacramento, CA. Pacific Legacy, Incorporated, Cameron Park, CA. July 2007. Accessed on October 26, 2023 at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3373/app_d.pdf

Vaughan, Clark, McGann, and Hamusek 1992 – Archaeological Reconnaissance For The Big Bend Timber Sale, Coyote & Fox Enterprises. Shasta County, California, "Terry Mill (P-45-002007)." California Department of Parks and Recreation Form, 1992. Prepared by T Vaughan, M. Clark, D. McGann, and B. Hamusek. 20230627T141922_fwp_NEIC-002792. Confidential.

5.5 Efficiency and Energy Resources

5.5.1 Environmental Setting

Existing Conditions

The proposed Fountain Wind Project (FWP or project) would generate electricity utilizing wind energy. The project would consist of up to 48 wind turbines, up to 7.2 megawatts (MW) each, with total capacity of up to 205 MW. Power generation would contribute baseload power to local and regional renewable energy supplies and increase the reliability of the electrical grid.

The project would also include a 200-kilowatt (kW) diesel-fired generator to support the operations and maintenance building during electrical outages.

Regulatory

Federal

There are no applicable federal laws, ordinances, regulations, and standards (LORS) that govern the efficiency of the utilization of wind turbines.

State

California 2022 Energy Efficiency Standards for Residential and Nonresidential Buildings—Green Building Standards Code, California Code of Regulations, Title 24. The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11) applies to the planning, design, operation, construction, use, and occupancy of newly constructed power plants and their ancillary facilities and requires the installation of energy efficient indoor infrastructure.

Senate Bill 100—The 100 Percent Clean Energy Act of 2018. Senate Bill (SB) 100 (Chapter 312, Statutes of 2018) requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt-hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. The bill also requires the Public Utilities Commission, California Energy Commission, and State Air Resources Board to utilize programs authorized under existing statutes to meet the state policy goal of 100 percent of total retail sales of electricity in California provided by eligible renewable energy resources and zero-carbon resources by December 31, 2045**.**

Local

Shasta County General Plan. The Energy Element of the General Plan promotes the increase and development of renewable energy resources.

Cumulative

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

However, the Fountain Wind project would have no cumulative energy and energy resource impact with past, present, or probable future projects.

5.5.2 Environmental Impacts

EFFICIENCY AND ENERGY RESOURCES Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, energy

5.5.2.1 Methodology and Thresholds of Significance

Methodology

The above environmental checklist.

Thresholds of Significance

There are no thresholds of significance applicable to this project.

5.5.2.2 Direct and Indirect Impacts

a. Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction

Less Than Significant Impact. Construction would take approximately 28 months to complete. Construction activities would include timber removal, site preparation, concrete pouring, turbine and transformer installation, substation, and operations and maintenance buildings (FWPA). Throughout these construction activities, various equipment, such as bulldozers, excavators, cranes, and trucks would consume nonrenewable energy resources, primarily fossil fuels such as gasoline and diesel. It is anticipated that fossil fuels used by this equipment during construction would be used efficiently and would not result in significant long-term depletion of these energy resources or permanently increase the project's reliance on them.

The idling time of construction equipment during the construction phase would be minimized by either shutting off equipment when not in use or reducing the idling time to a maximum of 5 minutes. In addition, construction waste would be transferred to a disposal and recycled (FWPA).

Therefore, construction would have a less-than-significant impact on local and regional energy supplies and a less-than-significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.

Operation

Less Than Significant Impact. By harnessing the kinetic energy of the wind and converting it into mechanical energy, the project uses wind energy to generate electricity through wind turbine generators. Wind energy is an abundant resource that cannot be depleted.

Wind turbines have an efficiency between 20 and 40 percent (EPA 2013). Modern wind turbines have demonstrated a typical efficiency rating of 45 percent (PennState 2018, Vernier 2024). Despite the wind turbine's designed capabilities, the efficiency is limited. This limit, known as the Betz Limit or Betz Law, states that the maximum amount of wind energy (kinetic energy) that can be captured by wind turbines is 59.3 percent, and the rest of the wind energy pass through the wind turbine blades and cannot be utilized (Betz 2023). However, additional power losses occur when converting wind power to electrical power. The above efficiency range accounts for these losses.

The project would include equipment requiring diesel fuel. This includes maintenance equipment, crane trucks, and an emergency generator. The generator is expected to operate for no more than 100 hours per year for operation and reliability purposes (i.e., readiness testing and maintenance). The total quantities of diesel fuel used for the maintenance equipment, crane truck, and generator would be approximately 248 barrels per year (bbl/yr).[1] California has a diesel fuel supply of approximately

1 Calculated as: 10,402 gallons per year x 0.024 bbl per gallon = 248 bbl per year.

298,771,000 bbl/yr.[2] The project's use of fuel would constitute a small fraction (less than 0.00008 percent) of available resources, and the state's supply is more than sufficient to meet necessary demand. For these reasons, the project's use of fuel would be less than significant.

Staff concludes that energy consumed by the project would not create significant adverse effects on energy supplies or resources, nor would it consume energy in a wasteful or inefficient manner.

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Construction

Less Than Significant Impact. The project is committed to energy-efficient construction and would implement measures to reduce energy consumption during construction process. The project would recycle construction and demolition debris in compliance with Assembly Bill 341 and State Bill 1018. Moreover, the project would also comply with the California Green Building Code.

Operation

Less Than Significant Impact. During operation, the project would utilize wind energy to provide up to 205 MW baseload electricity to the Pacific Gas and Electric (PG&E) transmission system. PG&E has committed to meeting California's Renewable Portfolio Standard through its Integrated Resource Plan (PG&E 2022). PG&E's 2022 Power Content Label's Base Plan includes 38.3 percent Eligible Renewable, which includes 4.6 percent biomass and biowaste, 0.5 percent geothermal, 1.8 percent eligible hydroelectric, 22 percent solar, and 9.4 percent wind (PG&E 2022a). The project would increase renewable energy generation capacity in PG&E and the State's portfolio. Furthermore, the project would be consistent with SB 100.

The project would comply with the California Green Building Code through conformance with the California Building Standard Codes.

The project's use of diesel for maintenance equipment and emergency generators would not obstruct or inhibit the state from achieving its energy-related goals. These equipment and generators would be limited in use. Furthermore, the project's primary goal is to provide capacity and energy to California's electric markets and subsequently contribute to the state's commitment to establishing an environmentally clean and reliable electrical system.

2 This is the sum of the annual production of 102,480,000 bbl and available stocks of 196,291,000 bbl obtained from the Energy Commission's Weekly Fuels Watch Report for 2022 (latest annual report available).

Through energy-efficient design and increased renewable electricity generation, the project would neither conflict with nor obstruct state or local plans for renewable energy or energy efficiency and, therefore, would have no impact on those plans.

5.5.2.3 Cumulative Impacts

None.

5.5.3 Project Conformance with Applicable LORS

Table 5.5-1 staff's determination of conformance with applicable state LORS to ensure the project would comply with LORS. As shown in this table, staff concludes that the proposed project would be consistent with all applicable LORS.

TABLE 5.5-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
State	
Senate Bill 100—The 100 Percent Clean Energy Act of 2018.	**Yes.** The project would comply with SB100 through its energy-efficient design and increasing renewable electricity generation.
California 2022 Energy Efficiency Standards for Residential and Nonresidential Buildings—Green Building Standards Code, California Code of Regulations, Title 24.	**Yes.** The project would comply with the California Green Building Code through conformance with the California Building Standard Codes.
Shasta County General Plan	**Yes.** The project would comply with the County's General Plan since the project would use renewable energy resources.

5.5.4 Conclusions and Recommendations

As discussed above, the project would have a less than significant impact related to efficiency and energy resources and would conform with applicable LORS.

5.5.5 Proposed Conditions of Certification

None.

5.5.6 References

Betz 2024 – Wikipedia. Betz's Law. Accesses on: January 3, 2024. Available online at: https://en.wikipedia.org/wiki/Betz%27s_law

EPA 2013 – United States Environmental Protection Agency (EPA). Renewable Energy Fact Sheet: Wind Turbines. Accesses on: January 3, 2024. Available online at: https://www.epa.gov/sites/default/files/2019-08/documents/wind_turbines_fact_sheet_p100il8k.pdf

FWPA – Fountain Wind Project Application (TN 248288-1 through TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

PennState 2018 – PennState. Making wind farms more efficient. Accesses on: January 3, 2024. Available online at: https://www.psu.edu/news/research/story/making-wind-farms-more-efficient/

PG&E 2022 – Pacific Gas and Electric (PG&E). 2022 Integrated Resource Plan. Accesses on: January 3, 2024. Available online at: https://www.pge.com/en/about/doing-business-with-pge/integrated-resource-planning.html

PG&E 2022a – Pacific Gas and Electric (PG&E). 2022 Power Content. Accesses on: January 3, 2023. Available online at: https://www.pge.com/content/dam/pge/docs/account/billing-and-assistance/bill-inserts/1023-Power-Content-Label.pdf

Vernier 2024 – Vernier Science Education. Experiments. Accesses on: January 3, 2024. Available online at: https://www.vernier.com/experiment/rev-12_turbine-efficiency/

5.6 Geology, Paleontology, and Minerals

5.6.1 Environmental Setting

Assessment of the existing environmental setting was based on reviews of publicly available literature, maps, air photos, and documents presented with the application. An online database search also was performed to identify previously reported paleontological resources near the project site. This included a review of the online database maintained by the University of California Museum of Paleontology (UCMP) at Berkeley (UCMP 2023). The geologic map and literature review of the project area included maps published by the California Geologic Survey (CGS), (Lydon et al. 1960), Norris and Webb (Norris and Webb 1990), and (Dupras 1997a).

Existing Conditions

Paleontological Resources

Paleontological resources are fossils and fossiliferous deposits consisting of vertebrate fossils, invertebrate fossils, plant and trace fossils and other data. Paleontological resources are considered to be older than recorded human history and older than middle Holocene (older than approximately 5,000 radiocarbon years) (SVP 2010).

Fossils are important scientific and educational resources because of their use in documenting the present and evolutionary history of particular groups of now-extinct organisms. Fossils are important in reconstructing the environments in which those organisms lived; in determining the relative ages of the strata in which they occur; and of the geologic events that resulted in the deposition of the sediments that buried them. Fossils are considered a nonrenewable scientific resource and are afforded protection under several federal, state, and local laws, ordinances, and regulations because the organisms they represent no longer exist.

Paleontological Potential

According to California Environmental Quality Act (CEQA) guidelines Appendix G, Section VII(f), a project would result in a significant impact to paleontological resources if it would directly or indirectly destroy a unique paleontological resource or site or a unique geologic feature. Geologic mapping published by the CGS (Lydon et al. 1960, Dupras 1997a) indicates a majority of the project site is underlain by two types of volcanic rock (andesite and basalt, which are discussed in detail below). In general, volcanic rocks have low to no paleontological potential and sensitivity, due to the extremely high temperatures associated with the formation of the rocks and the nature of lava flows. Nonetheless, the UCMP online collections database was searched for fossil localities from geologic units mapped as occurring in the project site. Data provided through the UCMP's online database includes taxonomic identification, locality number and name, age, and county, and sometimes geologic formation. Precise locality data is not provided; however, in some cases the locality name can be used to further refine

the general vicinity of the locality within the county. The results of this search indicate no vertebrate fossil discoveries within the geologic formations within the project site have been previously recorded (UCMP 2023).

Geological Resources

According to CEQA guidelines Appendix G, Section VII(a)(1), a project would result in a significant impact to geology if it would directly or indirectly cause 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.

Local Setting

The approximately 2855 acre project site consists exclusively of private property operated as managed forest timberlands. The property is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately south of California State Route (SR) 299, and near the private recreational facility of Moose Camp and other private land holdings. Other nearby communities include Montgomery Creek, Round Mountain, Wengler, and Big Bend. Access to the project site would be provided regionally and locally by Interstate 5, approximately 35 miles to the west; SR 139, approximately 60 miles to the east; SR 299, the approximate northern site boundary; and via three existing, gated logging roads that would be used to enter and leave the project site.

Regional Geology

The project site is located within the Cascade Range Geomorphic Province in eastern Shasta County. The Cascade Range is characterized by a chain of volcanic cones that extend through Washington and Oregon and into California. The region in which the project is proposed is dominated by Mount Shasta, a glacier-mantled volcanic cone, rising 14,162 feet above sea level. The southern termination is Lassen Peak, which last erupted in 1915. The Cascade Range is transected by deep canyons of the Pit River. The river flows through the range between these two major volcanic cones, after winding across interior Modoc Plateau on its way to the Sacramento River. Mount Shasta is approximately 40 miles to the northwest of the northern portion of the project site boundary, and Lassen Peak is approximately 20 miles southeast of the southern portion of the project site boundary. (CGS 2002)

The project site is proposed to be located approximately 1-mile west of the existing Hatchet Ridge Wind Project at the north end of a range of mountains including Lookout Mountain, Snow Mountain, and Green Mountain.

Local Geology and Stratigraphy

Geologic mapping indicates the project site is almost entirely underlain by Pliocene and Pleistocene-age andesitic, basaltic, and pyroclastic volcanic rocks (Dupras 1997a, Lydon et al. 1960, Norris and Webb 1990), originating from volcanic eruptions from Lassen

Peak and other volcanic centers of the Cascade Volcanic Arc (Clynne et al. 2012). Geologic mapping also indicates the presence of the Eocene-age Montgomery Creek formation west of the central western border of the project site. The Montgomery Creek formation consists of weakly indurated, thick-bedded arkosic sandstone, conglomerate, and shale; nonmarine and mostly fluviatile; locally includes coal beds. (Dupras 1997a, Irwin 1994).

Subsurface Soils

Nineteen borings and 8 test pits were performed for the project site as part of a preliminary geotechnical engineering report prepared by Terracon, dated September 10, 2021 (TN248292-1). The borings were drilled to depths of between 5 and 61.5 feet below ground surface (bgs). The test pits were excavated to depths of 4 feet bgs. Volcanic bedrock was encountered in 7 of the borings at depths ranging from 6 to 30 feet bgs.

In general, the borings and test pits encountered residual bedrock derived soils comprised of variable amounts of silt, sand, and gravel overlying Pleistocene- to Pliocene-age basalt bedrock. The basalt bedrock was observed to be moderately to highly weathered, very weak to very strong, and showed a very poor to fair Rock Quality Designation (RQD). RQD is a measure of the quality of rock cores taken from a borehole. RQD signifies the degree of jointing or fracture in a rock mass measured in percentage, where RQD of 75 percent or more shows good quality hard rock and less than 50 percent show low quality weathered rocks. The RQD performed during the exploration ranged from 0 percent to 63percent. (TN248292-1).

Faulting and Seismicity

The project site is not within**,** nor does it intersect an established Alquist-Priolo Earthquake Fault Zone, as mapped by the State Geologist (CGS 2015). There are no known Holocene-active faults or pre-Holocene faults within the project site (CGS 2015). However, there are a number of fault systems in the region, outside of the project site boundaries (CGS 2015). The most significant of these fault systems, considering the proximity to the project site, are the Hatchet Ridge fault zone, the Rocky Ledge fault zone**,** and the Hat Creek fault zone. Of these, the Rocky Ledge and Hat Creek fault zones have been designated Earthquake Fault Zones by the State Geologist, meaning there is evidence of displacement sometime in the last 11,700 years and they are considered active (CGS 1990, CGS 1991). The Rocky Ledge fault zone and the Hat Creek fault zone are located approximately 8.5 miles and 15 miles to the northeast of the eastern border of the project site, respectively. The Hatchet Ridge fault zone is not considered active (because there is no evidence of displacement in the last 11,700 years) and is the nearest fault zone to the project site. It is located approximately 2 miles to the east of the eastern most border of the project site boundary.

Strong Ground Motion

Ground shaking occurs due to a seismic event and can cause extensive damage to life and property and may affect areas hundreds of miles away from the earthquake's epicenter. The extent of the damage varies by event and is determined by several factors, including magnitude and depth of the earthquake, distance from epicenter, duration and intensity of the shaking, underlying soil and rock types, and integrity of structures.

While Shasta County has a low level of historic seismic activity (Shasta County 2020a), the entire Northern California region, including the project site, could be subject to strong ground shaking during earthquakes. The 2014 Working Group on California Earthquake Probabilities concluded that there is a 95 percent probability that a magnitude (MW) 6.7 earthquake or higher will likely strike somewhere in Northern California by the year 2045 (Field et al. 2015).

ShakeMap is a product of the United States Geological Survey (USGS) Earthquake Hazards Program. ShakeMap earthquake scenarios represent one realization of a potential future earthquake by assuming a particular magnitude and location (USGS 2020). According to the ShakeMap that corresponds with an earthquake planning scenario generated by an estimated 7.2 MW earthquake on the Hat Creek fault zone, the project site would be subjected to moderate to strong seismic ground shaking (USGS 2016). While there is no ShakeMap earthquake scenario generated for the Rocky Ledge fault zone, it is assumed that an earthquake of equal or greater magnitude to the Hat Creek fault zone scenario would produce ground shaking of equal or greater magnitude.

Seismicity-Related Volcanic Activity Associated with Lassen Peak. Lassen Peak is considered an active volcano in the Cascade Range. The Lassen Volcanic Center extends across an area of about 200 square miles and has experienced hundreds of eruptions during the last 825,000 years. The most recent three notable eruptions and associated volcanic activity were: Chaos Crags, 923 CE (common era); Cinder Cone, 1666 CE; and Lassen Peak, 1914 to 1917 CE Lassen Peak last erupted May 22, 1915 (CGS 2018). The region hosts a vigorous geothermal system, numerous hot springs, steam vents, and boiling mud pots. (USGS 2023)

There are seven volcanoes in California that are considered by the USGS and the CGS as having a high to very high threat potential.

There is currently no method for predicting when volcanic eruptions will occur, though increased seismicity and ground deformation are often the first indication of a potential eruption in volcanically active areas. Increased seismicity may provide the earliest indication that a volcanic system is being recharged, and that the system could be evolving toward an eruption (Clynne et al. 2012).

While volcanic eruptions are not analyzed under CEQA, the increased seismicity that is associated with the Lassen Volcanic Center could contribute to strong seismic ground shaking at the project site, as well as other geologic hazards that can occur as a result of seismic ground shaking (i.e., liquefaction and landslides).

Mineral Resources

In the context of CEQA, mineral resources are land areas or deposits deemed significant by the California Department of Conservation. A mineral resource is a concentration of natural inorganic materials or fossilized organic material occurring in such form, quantity, or quality that there are reasonable prospects for economic extraction. Inorganic mineral resources include non-fuel materials such as aggregate (sand and gravel), metals (gold, silver, and iron), and industrial minerals (clays, limestone, and gypsum). Petroleum resources include crude oil and natural gas.

Mining has been an important industry in Shasta County since gold was discovered by P.B. Reading on Clear Creek in 1848. Shasta County was one of the two most important centers of mining in California during the 1849 Gold Rush and continuing through the late 19th century (Shasta County 2020b).

There are fourteen metallic minerals that have been historically mined in Shasta County: cadmium, chromite, copper, gold, iron, lead, manganese, molybdenite, platinum, pyrite, mercury, silver, tungsten, and zinc. Most of the metallic ores lie in western Shasta County, the French Gulch district being the most important gold producing area of the region. The West and East Shasta Copper-Zinc belts contain the County's principal copper deposits. These belts extend from Iron Mountain northeast to Backbone Creek, then east to Ingot, a distance of about 30 miles (Shasta County 2020b).

During the late 1800's and early 1900's, Shasta County became the most important copper producing area in California, and one of the most important in the United States. Over the years, Shasta County has produced more than 700 million pounds of copper, which is more than half of all the copper produced in California (Shasta County 2020b).

Between 1874 and 1929, local coal reserves were in demand as an energy source for the County. By 1929, however, due to the extensive development of natural gas resources, coal usage had virtually ceased. The majority of coal deposits are located in the Montgomery Creek formation east of Redding and west of the project site (Shasta County 2020b).

In addition to coal, there are thirteen other non-metallic minerals that have been mined in Shasta County. These include alluvial sand and gravel, asbestos, barite, clay, crushed stone, diatomite, dimension stone, graphite, limestone, olivine, pumice and volcanic cinders, sulfur, and talc (Shasta County 2020b).

At the present time there are six different mineral resources under production in Shasta County. They include alluvial sand and gravel, crushed stone, volcanic cinders,

limestone, and diatomite. Production of aggregate for roads and buildings has become the dominant mining industry in Shasta County. The other mineral resource currently being produced is gold (Shasta County 2020b).

Other mineral resources are not currently being produced for a number of reasons, including the quality and quantity of the resource, the cost of extraction, processing and transportation, the potential environmental impacts, and current market conditions. Some mineral deposits are fairly limited and of relatively poor quality and, therefore, may never be developed again. However, other minerals, particularly metallic minerals such as copper, may again be produced when market conditions improve. In addition, gold mining is likely to significantly increase if and when the price of gold increases (Shasta County 2020b).

The State Mining and Geology Board (SMGB) is responsible for administration of a mineral lands inventory process termed classification designation. Areas are classified on the basis of geologic factors without regard to existing land use and land ownership. The SMGB has established Mineral Resources Zones (MRZ) throughout California. Under the California State Surface Mining and Reclamation Act of 1975, Mineral Resource Zones (MRZs) are defined by the State Geologist and used to classify areas by level of significance as a mineral resource. The following MRZ categories are used to classify land:

- MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- MRZ-2: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
- MRZ-3: Areas containing mineral deposits, the significance of which cannot be evaluated from available data.
- MRZ-4: Areas where available information is inadequate for assignment to any other MRZ.

The entire project site is located outside areas identified as MRZ-2 and MRZ-3 for alluvial sand and gravel, crushed stone, volcanic cinders, limestone, or diatomite; however, the project site is identified as not having adequate information to be considered MRZ-1 or MRZ-4. (Dupras 1997b).

The Division of Mine Reclamation's list of mines, referred to as the AB 3098 List and regulated under SMARA, lists 18 mines in Shasta County. The closest of these mines to the project site are Bales Mountain feldspar quarry, located approximately 6-miles to the north and the Bear Gulch limestone quarry and Oak Run sand and gravel quarry, located approximately 6- and 8-miles to the west (CDOC 2023a, CDOC 2023d).

According to the online California Department of Conservation (CDOC) Well Finder Interactive Map, there are no known oil, gas, or geothermal wells located within two

miles of the project site (CDOC 2023c). According to the USGS Mineral Resources online spatial data interactive map there are no mines within the project site boundaries; however, there are several gravel pits in proximity to the project site (USGS 2011).

Several issues influence the extraction of mineral resources in Shasta County, including the type and location of geologic units, the potential for impacts to the environment, commercial value, and land use conflicts. As a result, the extraction of mineral resources is limited to a relatively small number of sites throughout the county. In addition, at the project site, the geologic units at the surface and in the subsurface are widespread volcanic deposits that occur throughout the area; these units are not unique in terms of commercial value. Thus, the potential for rare recreational, commercial, or scientific deposits is very low.

Regulatory

The project would be required to comply with all applicable federal, state, and local laws and regulations and would need to obtain building permits that would be issued by the CEC. The issuance of the building permits and oversight provided by the CEC via the CEC's delegate chief building official would confirm that the project complies with the applicable regulatory framework.

Federal Geologic and Mineral Resources

No federal regulations related to geologic or mineral resources apply to the project design.

Federal Paleontological Resources

No federal regulations related to paleontological resources apply to the project design.

State Geologic and Mineral Resources

Seismic Hazards Mapping Act (Pub. Res. Code §2690et seq.)

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones, and cities, counties, and other local permitting agencies to regulate certain development projects within these zones. For projects that would locate structures for human occupancy within designated Zones of Required Investigation, the Seismic Hazards Mapping Act requires project applicants to perform a site-specific geotechnical investigation to identify the potential site-specific seismic hazards and corrective measures, as appropriate, prior to receiving building permits. CGS Guidelines for Evaluating and Mitigating Seismic Hazards (Special Publication 117A) provides guidance for evaluating and mitigating seismic hazards (CDOC 2023b, CGS 2008). CGS is in the process of producing official maps

based on USGS topographic quadrangles, as required by the Act. However, no mapping of the region that includes the project site has been compiled by CGS.

Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §4511-4360.2)

The Z'Berg-Nejedly Forest Practice Act and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including requisite erosion controls, such as drainage facilities, soil stabilization treatments, road and landing abandonment, removal and treatment of watercourse crossings, and any other features or actions to reduce surface erosion, gullying, channel erosion, and mass erosion.

The California Board of Forestry and Fire Protection provides additional guidance in its 2013 Road Rules and Technical Addendum No. 5: Guidance on hydrologic disconnection, road drainage, minimization of diversion potential and high-risk crossings (CAL FIRE 2013).

California Building Code

The California Building Code (CBC) prescribes standards for constructing safer buildings. The CBC contains provisions for earthquake safety based on factors including occupancy type, soil and rock profile, ground strength, and distance to seismic sources. The CBC requires that a site-specific geotechnical investigation report be prepared for most development projects to evaluate seismic and geologic conditions, such as surface fault ruptures, ground shaking, liquefaction, differential settlement, lateral spreading, expansive soils, and slope stability. The CBC is updated every three years, with the 2022 CBC effective on January 1, 2023.

The design of the proposed buildings, structures and infrastructure would be required to comply with CBC requirements (CBC 2022).

State Paleontological Resources

No state regulations related to paleontological resources apply to the project design.

Local Geologic and Mineral Resources

Shasta County General Plan, Seismic and Geologic Hazards

Section 5.1, Seismic and Geological Hazards, of the Shasta County General Plan describes specific objectives and policies regarding seismic and geological hazards that are related to the project (Shasta County 2020a).

Shasta County General Plan, Minerals

Section 6.3, Minerals, of the Shasta County General Plan describes specific objectives and policies regarding mineral resources (MR) related to the project (Shasta County 2020b).

Local Paleontological Resources

The Shasta County General Plan serves as the primary policy statement by the County Board of Supervisors for implementing development policies and land uses. The General Plan does not have any requirements specific to paleontological resources. However, paleontological resources often are considered a subcategory of prehistoric or cultural resources and are certainly considered significant natural or scientific resources. Thus, the Shasta County General Plan, Subsection 6.10 Heritage Resources (HER), may apply to paleontological resources (Shasta County 2020c).

Paleontological Resources Professional Standards

The Society of Vertebrate Paleontology (SVP), an international organization of professional paleontologists, has established guidelines and standard procedures that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 2010). This assessment was prepared in accordance with these guidelines.

Cumulative

The proposed project may have a cumulative impact when the incremental effect of the project is considerable when viewed in connection with other past, present, and reasonably foreseeable future projects. (Public Resource Code [PRC] Section 21083; California Code of Regulations [CCR] Title 14, Sections 15064[h], 15065[c], 15130, and 15355).

Geologic and Mineral Resources

Impacts related to geology, soils, and seismicity tend to be site-specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative impacts consists of the project site. The project could contribute to a cumulative impact on geology, soils, and seismicity if the effects of the project overlapped in time and space with those of other projects in the area, producing similar effects. Significant cumulative impacts related to geology could occur if the incremental impacts of the project combined with the incremental impacts of one or more of the cumulative projects described in Section 3.1.3.1, Cumulative Scenario of the Application for Certification (TN 248288-3), would cause substantial adverse effects involving geologic, seismic, or soil hazards.

Paleontological Resources

Geologic mapping published by the CGS (Lydon et al. 1960, Dupras 1997a) indicates the project site is underlain by two types of volcanic rock (andesite and basalt). In general, volcanic rocks have low to no paleontological potential and sensitivity, due to the extremely high temperatures associated with the formation of the rocks and the nature of lava flows. Therefore, the potential of the project to contribute to cumulative negative impacts on paleontological resources would be negligible.

5.6.2 Environmental Impacts and Mitigation

GEOLOGY, PALEONTOLOGY, AND MINERALS Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i. 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 Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☒	☐	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☒	☐	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on geologic units 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?	☐	☒	☐	☐
d. Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2022), creating substantial direct or indirect risks to life or property?*	☐	☐	☒	☐
e. 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?	☐	☐	☒	☐
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
g. 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?	☐	☐	☒	☐
h. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local	☐	☐	☒	☐

GEOLOGY, PALEONTOLOGY, AND MINERALS Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
general plan, specific plan or other land use plan?				

Environmental checklist established by CEQA Guidelines, Appendix G, geology and soils and minerals.
*****Geology and Soils question (d) reflects the current 2022 California Building Code (CBC), effective January 1, 2023, which is based on the International Building Code (2021).

5.6.2.1 Methodology and Thresholds of Significance

To assess potential impacts on unique geologic features and effects on mineral resources, staff has reviewed geologic and mineral resource maps for the surrounding area, as well as site-specific information provided by the project applicant, to determine if geologic and mineralogic resources exist in the area.

To develop a baseline paleontological resources inventory of the project study area, which includes the proposed project footprint and a one-mile buffer, published and available unpublished geological and paleontological literature was reviewed. Sources included geological maps, satellite photography, technical and scientific reports, and electronic databases. The potential paleontological productivity of geologic units that may be affected by project implementation was developed through a paleontological resources records search. For this project, a paleontological resources records review was conducted using the UCMP online database (UCMP 2023).

5.6.2.2 Direct and Indirect Impacts

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. 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 Publication 42.

Construction

Less Than Significant Impact. The probability that construction of the proposed project would have an impact on the risk of loss, injury, or death involving rupture of an earthquake fault during construction is remote. No Alquist-Priolo Earthquake Fault Zones or other known active faults are mapped crossing the site. However, strong seismic ground shaking could occur at the project site due to nearby active faults and from potential seismic events related to nearby volcanic activity. Recommendations for ground improvement to further reduce, to the extent feasible, the ground settlement

hazard at the site due to strong ground shaking would be provided in a site-specific design-level geotechnical investigation report and incorporated into the project design.

Due to the distance to known and mapped faults from the site, the development of the project would not expose people or buildings to known risks of fault rupture. Given this, the impact would be less than significant.

Operation

Less Than Significant Impact. The probability that the operation or maintenance of the proposed project would have an impact on the risk of loss, injury, or death involving rupture of an earthquake fault during operation is remote. Since there are no mapped Alquist-Priolo Special Studies Zones for active faults crossing the project site and the zone of damage related to a fault surface rupture are limited to a relatively narrow area along either side of the fault during rupture, the impact would be less than significant.

ii. Strong seismic ground shaking?

Construction

Less Than Significant Impact with Mitigation. The project site is not located within a mapped active fault zone as defined by the Alquist-Priolo Act. However, strong seismic ground shaking could occur at the project site due to nearby active faults and from potential seismic events related to nearby volcanic activity. Shaking from an earthquake or volcanic activity can result in structural damage and can trigger other geologic hazards such as landslides and liquefaction.

The final design of the project would include an assessment of the potential impacts of strong seismic ground shaking from a site-specific design-level seismic event. Seismic hazards would be minimized, to the extent feasible, by conformance to the applicable seismic design criteria of the CBC (CBC 2022). Furthermore, recommendations for ground improvement to further reduce, to the extent feasible, landside and ground settlement hazards at the site would be provided in a site-specific design-level geotechnical investigation report and incorporated into the project design.

A project-specific geotechnical engineering report would be provided to the CEC for review and approval prior to the issuance of a building permit, and the project would be required to comply with all recommendations in this report when constructing the project. With the implementation of seismic design criteria per the current CBC (CBC 2022), as well as the anticipated project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property, directly or indirectly, to significant impacts associated with geologic or seismic ground shaking.

Operation

Less Than Significant Impact. During the operation and maintenance of the proposed project, the project facility could be subject to strong seismic ground shaking. However,

with the implementation of the seismic design guidelines per the current CBC (CBC 2022), as well as the anticipated project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property, directly or indirectly, to significant impacts associated with geologic or seismic ground shaking. Therefore, the impacts of the project on the safety of people or structures from strong seismic ground shaking would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

Construction

Less Than Significant Impact. Liquefaction is a phenomenon in which saturated, cohesionless soils, such as sand and silt, temporarily lose their strength and liquefy when subjected to dynamic forces, such as intense and prolonged ground shaking. To be susceptible to liquefaction, potentially liquefiable soils must be saturated or nearly saturated. In general, liquefaction hazards are most severe in saturated soils within the upper 50 feet of the ground surface. The potential for liquefaction increases with shallower groundwater conditions. The potential hazards associated with liquefaction are ground deformation and lateral spreading.

While the project site may be subject to strong seismic ground shaking in the event of an earthquake or volcanic activity in the area, there is generally low risk of liquefaction according to the Shasta County General Plan and geologic mapping (Shasta County 2020a, Dupras 1997a). Liquefaction is most likely to occur in alluvial (geologically recent, unconsolidated sediments) and stream channel deposits, especially when the groundwater table is high. The project site is underlain primarily by volcanic deposits (not generally susceptible to liquefaction) and the groundwater level being relatively deep (greater than 50 feet deep), the potential for liquefaction or other ground failure is low.

In addition, a project-specific final design would be included within a geotechnical engineering report and provided to the CEC for review and approval prior to the issuance of a permit, and the project would be required to comply with all recommendations in this report when constructing the project. Therefore, with the implementation of the seismic design criteria for ground failure and the anticipated project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property to any significant direct or indirect impacts associated with geologic or seismic conditions onsite, including liquefaction.

Operation

Less Than Significant Impact. During the operation and maintenance of the proposed project the project facility could be subject to strong seismic ground shaking (TN 248288-11). However, by implementing the seismic design guidelines per the current CBC (CBC 2022), as well as the project-specific recommendations in the final geotechnical engineering report, the project would not expose people or property, directly or indirectly, to significant impacts associated with the effects of seismic ground

shaking, such as ground failure, liquefaction, or subsidence. Therefore, risks to people or structures from strong seismic ground shaking would continue to be low and thus the project impact would be less than significant.

iv. Landslides?

Construction

Less Than Significant Impact with Mitigation. Landslides are one of the various types of downslope movements in which rock, soil, and other debris are displaced due to the effects of gravity. The potential for material to detach and move down slope depends on a variety of factors including the geologic unit present, water content, and steepness of terrain. CGS has not mapped the project site region for susceptibility to landslide risks under the Seismic Hazards Mapping Act (Public Resources Code §2690 et seq.). (TN248288-11)

The Shasta County General Plan, however, mentions that landslides are known to occur throughout the county, and are especially prevalent in its northern and eastern areas. Although landslides are known to occur throughout the county, seismically-induced landslides are not considered a significant hazard in Shasta County (Shasta County 2020a).

According to geologic mapping by Dupras, there are no landslide deposits mapped within the project site (Dupras 1997a). According to topographic maps prepared by USGS, the project site includes relatively steep slopes (USGS 2018a, USGS 2018b) where landslides, debris flows, or rock falls could occur. Furthermore, according to the CDOC Reported California Landslides interactive map, rocks and debris was reported blocking SR 299 near the northeast corner of the project site on January 17, 2023 (CDOC 2023e). Staff is also aware of public comments (TN 253520) referencing multiple landslides in the area around the project site.

A site-specific, design-level geotechnical investigation would analyze site-specific conditions, including any potential for landslides or other slope instability in accordance with CBC requirements. Should any potential impact be identified, the resulting report would provide seismic design requirements consistent with the most updated version of the CBC, which would be implemented during construction and decommissioning to significantly reduce the potential for the project to induce a landslide and thus any damage to structures that may be caused by landslides.

Compliance with CBC requirements, including recommendations provided in the site-specific design-level geotechnical report, would ensure impacts related to landslides would be less than significant.

Operation

Less Than Significant Impact. Construction, operation, and maintenance of the project would not change the general surface morphology of the site. Therefore, direct or indirect impacts associated with landslides would be less than significant.

b. Would the project result in substantial soil erosion or the loss of topsoil?

Construction

Less Than Significant Impact. Construction activities associated with the project (including excavation, trenching, grading, and stockpiling) would temporarily increase sedimentation and erosion by exposing soils to wind and runoff until construction is complete and new vegetation is established. The project would be subject to construction-related storm water permit requirements. By complying with these permits and other applicable laws and regulations, substantial soil erosion or loss of topsoil would not occur; and runoff from the project site would not violate the applicable waste discharge requirements or otherwise contribute to the degradation of stormwater runoff quality. Therefore, impacts related to erosion and loss of topsoil would be less than significant.

Commercial and pre-commercial timber would be harvested, treated, and/or removed from the project site prior to construction. Soil erosion could occur as a result of timber clearance and harvesting activities. Prior to any clearing and harvesting activities the project would be required to comply with a Timber Harvesting Plan (THP). The THP would specify the location of timber to be harvested, how it would be harvested, and environmental best management practices (BMPs) that would be implemented during harvesting. The BMPs would include practices to protect water quality (by regulating soil erosion) during timber harvesting. In addition, as discussed above in the Regulatory Setting, the timber harvest activities would be required to adhere to the Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.). Compliance would include implementing erosion controls, such as drainage facilities, soil stabilization treatments, road and landing abandonment, removal and treatment of watercourse crossings, and any other features or actions to reduce surface erosion, gullying, channel erosion, and mass erosion. Typically, implementation of erosion control measures during the timber removal activities followed by prompt soil stabilization treatments have proven effective in minimizing erosion and the loss of topsoil. Therefore, timber harvesting would have a less-than-significant impact related to erosion and loss of topsoil.

Operation

Less Than Significant Impact. Activities that would occur during the project's operation and maintenance period also could increase the risk of erosion or sediment transport if not managed appropriately. Such activities could include on-site use of utility vehicles,

cranes, and other equipment to maintain rotors or other major wind turbine components as well as periodic grading or compaction of permanent access roads to minimize erosion, and the cleaning of catch basins, roadway ditches, and culverts. If not managed properly, these activities could increase the risk of erosion and sediment transport and could create a significant impact.

Implementation of the required Storm Water Pollution Prevention Plan (SWPPP) and adherence to the requisite BMPs during the operations and maintenance phases, as well as the BMPs included in the THP during timber clearance and harvesting, impacts related to soil erosion and loss of topsoil would be less than significant.

c. Would the project be located on geologic units 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?

Construction

Less Than Significant Impact with Mitigation. The project would not 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. This is because the project owner is required to follow the CBC (CBC 2022) plus any local amendments, which requires that a final geotechnical report is prepared and the building design adheres the final report findings, per the CBC. Therefore, impacts associated with construction on geologic units or soil that could become unstable would have a less than significant impact.

Operation

Less Than Significant Impact. Operation and maintenance activities could include on-site use of utility vehicles, cranes, and other equipment to maintain rotors or other major wind turbine components as well as periodic grading or compaction of permanent access roads to minimize erosion, and the cleaning of catch basins, roadway ditches, and culverts.

With implementation of the required SWPPP and adherence to the requisite BMPs during the operations and maintenance phases, as well as the BMPs included in the THP during timber clearance and harvesting, the impacts related to increased soil instability from operation and maintenance activities would be less than significant.

d. Would the project be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2022), creating substantial direct or indirect risks to life or property?

Construction and Operation

Less Than Significant Impact. Expansive soils shrink and swell with wetting and drying. Potential causes of moisture fluctuations include drying during construction, and subsequent wetting from rain, capillary rise, landscape irrigation, and type of plant selection. If untreated, expansive soils could damage future buildings and pavements on the project site. Expansive soils, if present, can be readily mitigated by either soil amendments or by removal and replacement with non-expansive soils, among other methods.

Laboratory test performed on select soil samples collected during the development of the 2021 preliminary geotechnical engineering report indicate that the on-site soils generally have low plasticity or are non-plastic (TN248292-1). The site soils will be further evaluated during design-level geotechnical investigations.

The project site is not located on expansive soil as defined in Section 1803.5.3 of the CBC. The project would be required to adhere to the CBC, which would reduce impacts related to expansive soils to a less than significant level, if they were later identified on the project site. Therefore, risks to people or structures from expansive soil would be less than significant.

e. Would 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 wastewater?

Construction and Operation

Less Than Significant Impact. The planned Operation and Maintenance Facility would be served by an onsite septic system for the disposal of wastewater.

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey provides generalized data in terms of a rating class, which indicates the extent to which soils could be limited according to soil series classification. The ratings are based on the soil properties that may affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity, depth to water table, ponding, depth to bedrock, and flooding affect the absorption of the effluent. Subsidence and excessive slope could also affect septic tank use (NRCS 2019).

Soils may be rated either “Not limited,” “Somewhat limited,” or “Very limited.” According to Web Soil Survey data, the majority of the soils within the project site are considered “Very limited,” indicating that the soils have one or more features that are unfavorable for septic tank use (NRCS 2019).

Actual performance of the soils in the vicinity of the Operation and Maintenance facility would be dependent on site-specific characteristics. If the system is not designed

appropriately, onsite soils could be incapable of disposing the anticipated volumes of wastewater.

Prior to installation, a septic system permit would be required by the Shasta County Department of Resource Management's Environmental Health Division. Adherence to requirements of the septic system permit would include site-specific soil testing and percolation tests to ensure the onsite septic system would be installed properly and within adequate soils that meet minimum county standards. With incorporation of an approved on-site sanitary waste system, the project would be capable of adequately supporting the use of septic tanks and therefore considered to have a less than significant impact.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Construction and Operation

Less Than Significant Impact. Geologic mapping published by the California Geologic Survey (Lydon et al. 1960, Dupras 1997a) indicates the project site is underlain by two types of volcanic rock (andesite and basalt). In general, volcanic rocks have low to no paleontological potential and sensitivity, due to the extremely high temperatures associated with the formation of these rocks and the nature of lava flows. Nonetheless, the UCMP database was searched for fossil localities from geologic units mapped as occurring in the project site. The results of this search indicate no vertebrate fossil discoveries within the geologic formations within the project site have been previously recorded (UCMP 2023).

Geologic mapping did indicate the presence of the Montgomery Creek formation west of the central western border of the project site boundary (Dupras 1997a, Irwin 1994). The Montgomery Creek formation consists of weakly indurated, thick-bedded arkosic sandstone, conglomerate, and shale; nonmarine and mostly fluviatile; and locally includes coal beds. Early publications by C.A. Anderson and R. D. Russell (Anderson et al. 1939), indicate fossil leaves have been collected from several localities within the Montgomery Creek formation. If during the final geotechnical investigation, the Montgomery Creek formation is found to be present within the project site boundaries, appropriate mitigation measures may be warranted to protect potential impacts to paleontological resources. However, based on the information known to date, impacts to paleontological resources from construction or maintenance activities would be less than significant.

There are no unique geologic features within the site footprint.

g. Would 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?

Construction and Operation

Less Than Significant Impact. The project site is in an area that does not contain any unique surficial or shallow surface mineral deposits. Therefore, the project would not result in the loss of availability of a known mineral resource.

h. Would 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?

Construction and Operation

Less Than Significant Impact. The geologic units at the ground surface and in the subsurface of the project area are not unique in terms of commercial value and the project site is not delineated on a local general plan, specific plan or other land use plan. The potential for recreational or scientific deposits (for example, rare minerals or fossils) is low, given the geologic environment in the area. Therefore, the project would not result in the loss of availability of a locally important mineral resource and thus impacts to mineral resources would be considered less than significant.

5.6.2.3 Cumulative Impacts

Impacts related to geology, soils, and seismicity tend to be site-specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative impacts consists of the project site. The project could contribute to a cumulative impact on geology, soils, and seismicity if the effects of the project overlapped in time and space with those of other projects in the area, producing similar effects.

Soil erosion and sedimentation would occur during timber clearance and harvesting, and these impacts would be the same for any other possible timber harvesting or clearance associated with other potential projects. Any other projects including timber harvest and clearance would be required to prepare a project THP and would be subject to the same BMPs requirements within that THP, which would further reduce any cumulative impact related to erosion and sedimentation.

Seismically-induced ground shaking, liquefaction and lateral spreading, and expansive or corrosive soils could cause structural damage during construction and operation phases. However, state and local building regulations and standards have been established to address and reduce the potential for such impacts to occur. The project and cumulative projects would be required to comply with applicable provisions of these laws and regulations. Through compliance with these requirements, the potential for impacts would be reduced. The purpose of the CBC (and related local ordinances) is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction; by design, it is intended to reduce the cumulative risks from buildings and structures. Based on compliance with these requirements, the incremental impacts of the project

combined with impacts of other projects in the area would not cause a significant cumulative impact related to seismically induced ground shaking, liquefaction and lateral spreading, or expansive or corrosive soils. Therefore, the incremental effect of the project on geologic hazards and mineral resources would be less than significant.

No unique surface or near surface geologic and mineralogic resources have been identified in the project area. Development of this project is not expected to result in a significant cumulative effect on geologic and mineralogic resources within the project area.

Geologic mapping published by the CGS (Lydon et al. 1960, Dupras 1997a) indicates the project site is underlain by andesite and basalt. In general, volcanic rocks have low to no paleontological potential and sensitivity, due to the extremely high temperatures associated with the formation of the rocks and the nature of lava flows. Therefore, the potential of the project to contribute to cumulative negative impacts on paleontological resources would be negligible.

5.6.3 Project Conformance with Applicable LORS

Table 5.6-1 provides staff's determination of conformance with applicable local, state, and federal LORS, including any proposed conditions of certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Federal	
No federal regulations related to geologic or mineral resources apply to the project facility design.	
State	
Z'Berg-Nejedly Forest Practice Act of 1973/Forest Practice Rules	
These Act and associated practice rules govern the management of privately owned forestlands in California, including requisite erosion controls, such as drainage facilities, soil stabilization treatments, road and landing abandonment, removal and treatment of watercourse crossings, and any other features or actions to reduce surface erosion, gullying, channel erosion, and mass erosion. For example: • Rule 915.1, 935.1, 955.1, which establishes performance standards for the use of heavy equipment for site preparation, including that such equipment "shall not be used for site preparation under saturated soil conditions that may produce significant sediment discharge; or when it cannot operate under its	**Yes.** The Timber Harvesting Plan would be required to adhere to the Z'Berg-Nejedly Forest Practice Act of 1973 and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.) and would specify the location of timber to be harvested, how it would be harvested, and environmental BMPs that would be implemented during harvesting. The BMPs would include practices to protect water quality (by regulating soil erosion) during timber harvesting.

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
own power due to wet conditions" (14 Cal. Code Regs. §915.1, 935.1, 955.1[b]). • Rule 916.7, 936.7, 956.7, which establishes performance standards for the reduction of soil loss (14 Cal. Code Regs. §§916.7, 936.7, 956.7). • Rule 3706(d), which establishes the following performance standard for drainage, diversion structures, waterways, and erosion control: "Surface runoff and drainage from surface mining activities shall be controlled by berms, silt fences, sediment ponds, revegetation, hay bales, or other erosion control measures, to ensure that surrounding land and water resources are protected from erosion, gullying, sedimentation and contamination. Erosion control methods shall be designed to handle runoff from not less than the 20 year/1-hour intensity storm event" (14 Cal. Code Regs. §3706[d]).	
California Building Code (2022)	
The California Building Code (CBC, 2022) includes a series of standards that are used in project investigation, design, and construction (including seismicity, grading and erosion control). The CBC has adopted provisions in the International Building Code and has been amended by Shasta County.	**Yes.** With the incorporation of **GEO-1** which requires the project owner to submit a Soils Engineering Report to the CBO for design review, the project would be in conformity with this LORS. This report must include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of seismicity; liquefaction; dynamic compaction; compressible soils; and corrosive soils. In addition, the report must also include recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present. Submittal and approval of this report would ensure compliance with this LORS.
Seismic Hazards Mapping Act, PRC §§2690–2699 (PRC, 2016b)	
Maps identify areas (zones) that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. Requires a geotechnical report be prepared that defines and delineates any seismic hazard prior to approval of a project located in a seismic hazard zone.	Yes. With the incorporation of **GEO-1**, which requires the project owner to submit a Soils Engineering Report to the CBO for design review, the project would be in conformity with this LORS. This report must include a thorough discussion of seismicity and recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present. Submittal and approval of this report would ensure compliance with this LORS.
Local	
Shasta County General Plan, Seismic and Geologic Hazards	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Section 5.1, Seismic and Geological Hazards, of the Shasta County General Plan describes the following objectives and policies regarding seismic and geological hazards that are related to the project (Shasta County, 2020a).	
Objectives: • **SG-1:** Protection of all development from seismic hazards by developing standards for the location of development relative to these hazards; and protection of essential or critical structures, such as schools, public meeting facilities, emergency services, high-rise and high-density structures, by developing standards appropriate for such protection. • **SG-2:** Protection of development on unstable slopes by developing standards for the location of development relative to these hazards. • **SG-3:** Protection of development from other geologic hazards, such as volcanoes, erosion, and expansive soils. • **SG-4:** Protection of waterways from adverse water quality impacts caused by development on highly erodible soils.	**Yes.** The project incorporates engineered grading and drainage plans to minimize grading and assure appropriate drainage of the facility. Additionally, mitigation measures, including sediment and erosion control during grading and construction activities, would be implemented to minimize environmental impacts related to erosion and sediment transport. The project, as proposed, complies with the goals and objectives and policies of the Shasta County General Plan.
Policies: • **SG-a:** Development proposals for critical or high-density structures, as defined in the Uniform Building Code, located within a half mile of any fault identified as an Earthquake Fault Zone by the California Division of Mines and Geology shall include a geologic study of potential fault rupture. Geologic studies which are undertaken shall be performed by a registered geologist according to general guidelines of the California Division of Mines and Geology. Proposals for critical structures, as defined in the Uniform Building Code, within the study area shall include a site-specific seismic hazards evaluation, including ground motion criteria for the design of new buildings and structures. • **SG-b:** In order to minimize development that would be endangered by landslides, geological investigations by a registered geologist or a geological engineer will be required on all subdivision and/or developments where the preliminary staff report indicates the possibility of landslides on or adjacent to the development. A landslide map shall be developed and maintained as these reports	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
are accumulated for reference by the development sponsors. • **SG-c:** Shasta County shall coordinate with State and Federal agencies monitoring volcanic activity and shall periodically review and update the Shasta County Emergency Plan with respect to volcanic hazards. • **SG-d:** Shasta County shall develop and maintain standards for erosion and sediment control plans for new land use development. Special attention shall be given to erosion prone hillside areas, including those with extremely erodible soil types such as those evolved from decomposed granite. • **SG-e:** When soil tests reveal the presence of expansive soils, engineering design measures designed to eliminate or mitigate their impacts shall be employed. • **SG-f:** Shasta County shall pursue preparation of development standards based on topography and soil erosion potential in revising its land capability standards pursuant to Policy CO-h. • **SG-g:** Shasta County should comply with the requirements of the Seismic Hazards Mapping Act when the Seismic Hazards Maps for the County are completed and made available by the State Geologist. The Maps will include liquefaction hazard zones and earthquake-induced landslide hazard zones.	
Shasta County General Plan, Minerals	
Section 6.3, Minerals, of the Shasta County General Plan describes the following objectives and policies regarding mineral resources related to the project (Shasta County, 2020b).	
Objectives: • MR-1 To identify, conserve, develop, and utilize Shasta County mineral resources while protecting mineral resource sites and access routes from potential conflicts with incompatible land uses. • MR-2 To encourage the production and conservation of minerals while giving consideration to values relating to recreation, watersheds, wildlife, range, forage, timberlands, and aesthetics. • MR-3 To ensure that mining operations are conducted in such a manner as to protect the public health, safety, and welfare; to minimize	**Yes.** The project, as proposed, complies with the goals and objectives and policies of the Shasta County General Plan.

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
adverse impacts on adjacent land uses; and to mitigate other potential adverse environmental impacts. • MR-4 To ensure that mined lands are reclaimed to minimize adverse impacts on the environment, to protect the public health and safety, and to restore mined lands sites to a usable condition which is readily adaptable to alternative land uses. • MR-5 To maintain an adequate long-term supply of mineral resources within the County, portland cement concrete grade alluvial sand and gravel. • MR-6 To encourage the use of recycled mineral resources, especially aggregate materials. • MR-7 To recognize the mineral information classified by the State Geologist and transmitted by the State Mining and Geology Board. • MR-8 To ensure the joint participation of residents, industry, and affected agencies in a well- defined and consistent regulatory process.	
Policies: • MR-a Mineral operations that are long-term (i.e. 30 years or more of expected operation) should be included in the Mineral Resource (MR) land use designation and in the Mineral Resource (MR) zone district. Included in this designation and zoning shall be areas used for extraction, processing, stockpiling, and shipping, and adjacent undeveloped areas within the same ownership as the mining operation site. Development and uses within MR designations and zone districts shall be regulated so that proposed future land uses will avoid or mitigate incompatibilities with mineral extraction operations. 1. Uses permitted in these areas should include mineral exploration and extraction, processing, and accessory uses. 2. Residential uses may be permitted for security and labor housing. 3. The minimum parcel size for lands in the MR designation shall be 20 acres.	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
• MR-b Land within up to one-half mile of MR designated and zoned mining operation sites, but outside the MR designation and zoning, should be included in the Mining Resource Buffer (MRB) land use designation combined with the principal land use designation, and in the Mineral Resource Buffer (MRB) Zone District combined with the principal zone district. Mining operation sites shall include the extraction, processing, stockpiling, and shipping areas of the mining operation, as defined in the reclamation plan. The MRB combining zone district shall be designed to allow for compatible land uses while protecting the potential for mineral resource development. 1. The extent of the buffer designation and zone will depend on the surrounding topography, site distance, and existing development. 2. Notices shall be recorded on the deeds for lots created by new land divisions and/or subject to discretionary land use permits within the MRB combining zone district to advise the property owners of the proximity of existing or potential mining operations and the potential impacts. 3. Principal land use designations considered to be incompatible with the MRB combining designation include Urban Residential (UR), Suburban Residential (SR), and Rural Residential A (RA). 4. The minimum residential parcel size for lands in the MRB combining designation shall be 5 acres, except where a smaller parcel size is permitted by the principal land use designation adopted prior to January 1, 1998. To the extent it is feasible, building sites shall be located on that portion of the property furthest from the mining operation site. 5. The MRB combining designation shall not be applied within the Cottonwood Community Plan area. • MR-c Mining operations which are short-term (i.e., less than 30 years of expected operation) should be included in the Interim Mineral Resource (IMR) land use designation	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
combined with the principal land use designation, and in the Interim Mineral Resource (IMR) Zone District combined with the principal zone district. The IMR combining zone district shall be designed to allow for compatible land uses while protecting the potential for mineral resource development. 1. Notices shall be recorded on the deeds for lots in new land divisions and/or subject to discretionary land use permits within the IMR combining zone district to advise the property owners of the proximity of the existing or potential mining operations and the potential impacts. 2. Principal land use designations considered to be incompatible with the IMR combining designation include Urban Residential (UR), Suburban Residential (SR), and Rural Residential A (RA). 3. Discretionary land use permits within one-half mile of an IMR zone district shall be mitigated, as determined necessary by CEQA review, to prevent conflicts with existing and potential mining operations. 4. The minimum acreage for lands in the IMR combining land use designation shall be 10 acres, except where a smaller parcel size is permitted by the principal land use designation adopted prior to January 1, 1998. • MR-d The County will initiate the redesignation and rezoning for existing mining operations which had reclamation plans approved prior to January 1, 1998, and which are not already so designated and zoned. Applicants shall initiate redesignation and rezoning for new mining operations. • MR-e All Portland cement concrete grade alluvial sand and gravel resource areas (classified as MRZ 2-b as shown on Plate 4 of the Mineral Land Classification study), and all diatomite resource areas (classified as MRZ 2-b as shown on Plate 8 of the same study), which are not presently occupied by existing incompatible land uses, should be designated and zoned Interim Mineral Resource (IMR). The designation and zoning of these specific	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
mineral resource areas shall be initiated by the County. • MR-f The MR General Plan land use designation shall replace the M designation. • MR-g Properties which were designated M and/or zoned MR prior to January 1, 1998, for which there was no approved use permit for mining and/or reclamation plan on said date, should be removed from the M designation and/or MR zone district, unless the property owner requests retention of the M designation and/or MR zone district and submits information to demonstrate that the subject property contains mineral resources which can be commercially developed. The County shall initiate removal of the M designation and MR zoning where appropriate. • MR-h In the future, lands may be placed in the MR, MRB, and IMR designations and zone districts, and lands presently in these designations and zone districts may be removed from them at the initiative of the County, the property owners, or the mine operators, based on the results of mineral resource exploration, and/or completion of extraction and reclamation of the mine site. When the mineral resource is exhausted and reclamation is completed, the property owner shall initiate removal of the MR, MRB, and IMR designations and zone districts from the subject property. • MR-i All new or expanded mining operations shall have a use permit to ensure that they are conducted in a manner to protect the public health, safety, and welfare, and to minimize adverse impacts on adjacent land uses and the environment. • MR-j On-site processing, including crushing, washing, screening, sorting, and stockpiling, should be allowed as much as possible at all mineral resource sites, subject to consideration of potential conflicts with adjacent and nearby land uses, and to mitigation of potential adverse environmental effects. However, concrete plants and asphalt plants should only be permitted in the Mineral Resource (MR) and General Industrial (M) zone districts, subject to approval of a use permit.	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
• MR-k Mining may be permitted in the in-stream or gravel bar areas of a river or creek provided the removal of sand and gravel is: 1. Conducted during a declared civil or hazardous material emergency or natural disaster to relieve or correct potential hazards to the public health, safety, or welfare caused by such emergency or disaster; or 2. For removal of dredger tailings for reclamation purposes only; or 3. To protect a public structure such as a bridge, when it is determined to be necessary by the public entity responsible for said structure; or 4. To remove a buildup of sand and gravel to maintain the channel capacity and prevent flooding. For sections 2, 3, and 4 of this policy, a use permit and reclamation plan for mining of in-stream and gravel bar areas shall be based on a stream management program, prepared by qualified professionals in appropriate disciplines, which includes data and analysis to show that: a. The mining or skimming will not lower the streambed below the designed optimum engineered channel profile and cross sections. b. The mining or skimming will cause a drop in the surrounding water table. c. There will be no significant adverse impact on in-stream habitat; riparian habitat; wetlands; or rare, threatened, or endangered species of fish, wildlife or plants. d. Salmon and steelhead trout spawning gravel within critically important streams, as identified in General Plan Policy FW-e, will be strictly protected. All gravel that is the appropriate size for spawning gravel for salmon and steelhead trout shall be left undisturbed, or removed and returned to the river or stream in a manner approved by the Department of Fish and Game.	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
e. There will be no significant adverse impact on existing structures, including bridges and levees. f. There will be no significant increase in bank erosion, deposition, or flooding caused by the extraction activity. • MR-l Mining may be permitted in the floodplain area of a river or stream provided that a plan is prepared by a qualified professional including data and analysis to show that the proposed mining in the floodplain will not alter the course of the adjacent river or stream, will not cause river or stream to flow through the mined area, and will not significantly change the boundaries of the floodplain. • MR-m Mining may be permitted in areas of agricultural soils, provided that a plan is submitted by a qualified professional including data and analysis to show that the soil shall be replaced in such a way as to maintain the same or better agricultural qualities and class as existed prior to mining disturbance. Mining in A-cg designated areas is subject to policy AG-g. • MR-n An operating term shall be required for each mining use permit. This would set a defined length of time during which mining may occur. Any extensions beyond the permit expiration would require further environmental review and discretionary approval. The term of mining should be balanced so as to allow sufficient time for the operator to amortize investments, without sacrificing regulatory effectiveness. The maximum length of time for which any mining permit may be approved is 30 years. • MR-o Aggregate recycling facilities should be included as a use permitted subject to a use permit in General Industrial and Mineral Resource zone districts. • MR-p The Mineral Land Classification of Alluvial Sand and Gravel, Crushed Stone, Volcanic Cinders, Limestone, and Diatomite within Shasta County, California, 1997, and the associated maps, by the California Department of Conservation, Division of Mines and Geology, is incorporated by reference as	

TABLE 5.6-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
a source of geologic and mineral resource technical information for the Shasta County General Plan. • MR-q The County should maintain a Surface Mining and Reclamation Act regulatory program to provide current information on mineral resources and mining operations, to review applications for mining permit and reclamation plans, to review mine reclamation financial assurances, to perform annual mine inspections and file inspection reports, to monitor reclamation of mine sites, and to enforce compliance with State and County mining regulations.	

5.6.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of certification, the project would have a less than significant impact related to geologic, mineral, and paleontological resources and would conform with applicable LORS. Staff recommends adopting the Conditions of Certification as detailed in subsection "5.6.5 Proposed Conditions of Certification" below.

5.6.5 Proposed Conditions of Certification

The following proposed conditions of certification include both measures to mitigate environmental impacts and ensure conformance with applicable LORS.

GEO-1 A Soils Engineering Report, as required by Section 1803 of the California Building Code (CBC 2022), or its successor in effect at the time construction of the project commences, shall specifically include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of seismicity; liquefaction; landslides; dynamic compaction; compressible soils; corrosive soils; and ground rupture due to faulting. In accordance with the CBC, the report must also include recommendations for ground improvement and foundation systems necessary to mitigate these potential geologic hazards, if present. In accordance with the California Business and Professions Code, the appropriate qualified California licensed individual(s) is required to sign and seal the Soils Engineering Report.

Verification: The project owner shall submit a copy of the Soils Engineering Report which addresses the potential for strong seismic shaking; liquefaction; landslides; dynamic compaction; settlement due to compressible soils; corrosive soils: and ground rupture due to faulting, and a summary of how the results of the analyses were incorporated into the project's foundation and grading plan design for review and comment by the delegate chief building official (CBO) and to the

Compliance Project manager for review and approval at least 60 days prior to grading.

5.6.6 References

Cal Fire 2013 – California Board of Forestry and Fire Protection (CAL FIRE). Appendix C: California Board of Forestry and Fire Protection 2013 Road Rules and Technical Addendum No. 5: Guidance on Hydrologic Disconnection, Road Drainage, Minimization of Diversion Potential and High-Risk Crossing. 2013. Accessed on: November 28, 2023. Available online at: http://www.pacificwatershed.com/sites/default/files/14_-_appendix_c_-_california_board_of_forestry_and_fire_protection.pdf

CBC 2022 – California Building Standards Commission. 2022 California Building Code (CBC), Title 24, California Code of Regulations. Accessed on: October 20, 2022. Available online at: https://codes.iccsafe.org/content/CABC2022P1/california-code-of-regulations-title-24

CDOC 2023a – California Department of Conservation. AB 3098 List. List Published November 28, 2023. Accessed on: November 28, 2023. Available online at: https://www.conservation.ca.gov/dmr/smara-mines

CDOC 2023b – California Department of Conservation (CDOC). Earthquake Zones of Required investigation. 2021. Accessed on: October 18, 2023. Available online at: https://maps.conservation.ca.gov/cgs/EQZApp/app/

CDOC 2023c – California Department of Conservation (CDOC). Oil and Gas Field Maps. Accessed on: November 28, 2023. Available online at: https://maps.conservation.ca.gov/doggr/wellfinder/

CDOC 2023d – California Department of Conservation (CDOC). Surface Mining and Reclamation Act (SMARA) Regulations. 2022. Accessed on: October 18, 2023. Available online at: https://www.conservation.ca.gov/dmr/lawsandregulations

CDOC 2023e – California Department of Conservation (CDOC). Reported California Landslides Interactive Map. Accessed on: January 11, 2024. Available online at: https://cadoc.maps.arcgis.com/apps/webappviewer/index.html?id=bc48ad40e3504134a1fc8f3909659041

Clynne et al. 2012 – Clynne, M. A., J. E. Robinson, M. Nathenson, and L. J. P. Muffler. Volcanic Hazards Assessment for the Lassen Region, Northern California. Scientific Investigations Report 2012-5176-A. United States Geological Survey. 2012. Accessed on: November 27, 2023. Available online at: https://pubs.usgs.gov/sir/2012/5176/a/

CGS 1990 – California Geological Survey (CGS). Fault Evaluation Report FER-209, Hat Creek, McArthur, and Related Faults; Shasta, Lassen, Modoc, and Siskiyou Counties, California. 1990. Accessed by Applicant. Not available online.

CGS 1991 – California Geological Survey (CGS). State of California Special Studies Zones, Burney Quadrangle, Official Map. Effective November 1, 1991. Accessed

on: November 27, 2023. Available online at: https://maps.conservation.ca.gov/cgs/informationwarehouse/regulatorymaps/

CGS 2002 – California Geologic Survey (CGS). California Geomorphic Provinces, Note 36. California Department of Conservation. 2002. Accessed on: November 27, 2023. Available online at: https://www.conservation.ca.gov/cgs/california-geotour

CGS 2008 – California Geological Survey (CGS). Guidelines for Evaluating and Mitigating Seismic Hazards, Special Publication 117A. California Geological Survey. 2008 Accessed on: November 27, 2023. Available online at: https://www.conservation.ca.gov/cgs/documents/publications/special-publications/SP_117a.pdf

CGS 2015 – California Geological Survey (CGS). Fault Activity Map of California. 2015. Accessed on: January 15, 2023. Available online at: https://maps.conservation.ca.gov/cgs/fam/.

Dupras 1997a – Dupras, D. Geology of Eastern Shasta County. California Division of Mines and Geology, California Department of Conservation. Open File Report 97-03. Plate 1B or 13. Map Scale 1:100,000. 1997. Accessed on: November 27, 2023. Available online at: https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc

Dupras 1997b – D. Composite Mineral Land Classification Map Showing Areas Classified for MRS-2 for Alluvial San and Gravel, Crushed Stone, Volcanic Cinders, and Diatomite Resources and Areas Classified for MRZ-3 for Alluvial Sand and Gravel Resource in Eastern Shasta County. California Division of Mines and Geology, California Department of Conservation. Open File Report 97-03. Plate 9B or 13. Map Scale 1:100,000. 1997. Accessed on: November 27, 2023. Available online at: https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc

Field et al. 2015 – Field, E. H., Biasi, G P., Bird, P., Dawson, T.E., Felzer, K. R., Jackson, D. D., Johnson, K. M., Jordan, T. H., Madden, C., Michael, A. J., Milner, K. R., Page, M. T., Parsons, T., Powers, P. M., Shaw, B. E., Thatcher, W. R., Weldon II, R. J., and Zeng, Y. Long-Term Time-Dependent Probabilities for the Third Uniform California Earthquake Rupture Forecast (UCERF3). Bulletin of the Seismological Society of America, Vol. 105, No. 2A, pp. 511–543. doi: 10.1785/0120140093. 2015. November 27, 2023. Available online at: https://pubs.geoscienceworld.org/ssa/bssa/article-abstract/105/2A/511/331850/Long-Term-Time-Dependent-Probabilities-for-the

Irwin 1994 – Irwin, W. P. Geologic Map of the Klamath Mountains, California and Oregon. United States Geologic Survey. 1994. Accessed on: November 27, 2023. Available online at: https://ngmdb.usgs.gov/Prodesc/proddesc_10149.htm

Lydon et al. 1960 – Lydon, P.A., Gay, T.E., Jr., Jennings, C. W. Geologic Map of California, Olaf P. Jenkins Edition, Westwood Sheet. California Division of Mines and Geology and United States Geological Survey. 1960. Accessed on: November 27, 2023. Available online at: https://ngmdb.usgs.gov/Prodesc/proddesc_371.htm

Norris and Webb 1990 – Robert M. Norris and Robert W. Webb, 1990, Geology of California, Second Edition, John Wiley and Sons. ISBN-13: 978-0471509806. Accessed on: October 18, 2023. Not available online.

NRCS 2019 – United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Web Soil Survey. 2019. Accessed on: November 29, 2023. Available online at: https://websoilsurvey.nrcs.usda.gov/app/

Shasta County 2020a – Shasta County General Plan, Section 5.1, Seismic and Geologic Hazards. 2020. Assessed on: November 27, 2023. Available online at: https://www.shastacounty.gov/planning/page/general-plan

Shasta County 2020b – Shasta County General Plan, Section 6.3, Minerals. 2020. Assessed on: November 27, 2023. Available online at: https://www.shastacounty.gov/planning/page/general-plan

Shasta County 2020c – Shasta County General Plan, Section 6.10, Heritage Resources. 2020. Assessed on: November 27, 2023. Available online at: https://www.shastacounty.gov/planning/page/general-plan

SVP 2010 – Society of Vertebrate Paleontology (SVP). Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. 2010. Assessed on: October 18, 2023. Available online at: https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines.pdf

UCMP 2023 – University of California Museum of Paleontology (UCMP). UCMP database. 2023. Accessed on: October 18, 2023. Available online at: http://ucmpdb.berkeley.edu/

USGS 2011 – United States Geological Survey (USGS). Mineral Resources Online Spatial Data: Interactive Maps and Downloadable Data for Regional and Global Geology, Geochemistry, Geophysics, and Mineral Resources. 2011. Accessed on: October 18, 2023. Available online at: https://mrdata.usgs.gov/general/map-us.html

USGS 2016 – United States Geological Survey (USGS). M 7.2 Scenario Earthquake—Hat Creek-McArthur- Mayfield, Earthquake Hazards Program. 2016. Accessed on: November 27, 2023. Available online at: https://earthquake.usgs.gov/scenarios/eventpage/nclegacyhatcreekmcarthurmayfieldm7p2_se/shakemap/intensity

USGS 2018a – United States Geological Survey (USGS). The National Map—US Topo. Hatchet Mountain Pass Quadrangle, Shasta County, 7.5-Minute Series. Map. Scale 1:24,000. 2018. Accessed on: November 29, 2023. Available online at: https://www.usgs.gov/programs/national-geospatial-program/topographic-maps

USGS 2018b – United States Geological Survey (USGS). The National Map—US Topo. Burney Mountain West Quadrangle, Shasta County, 7.5-Minute Series. Map. Scale 1:24,000. 2018. Accessed on: November 29, 2023. Available online at: https://www.usgs.gov/programs/national-geospatial-program/topographic-maps

USGS 2020 – United States Geological Survey (USGS). Earthquake Scenarios. 2020. Accessed on: November 27, 2023. Available online at: https://earthquake.usgs.gov/scenarios/

USGS 2023 – United States Geological Survey (USGS). California Volcano Observatory, Lassen Volcanic Center. Accessed on: November 28, 2023. Available online at: https://www.usgs.gov/volcanoes/lassen-volcanic-center

5.7 Hazards, Hazardous Materials, and Wildfire

This section describes the hazards, hazardous materials, and wildfire characteristics of the proposed project, evaluates the type and significance of impacts that could occur because of the proposed project, and identifies measures to avoid or reduce any impacts to less than significant.

5.7.1 Environmental Setting

Hazards and Hazardous Materials

Hazardous Materials

Hazardous materials are defined by federal and state regulations that aim to protect public health and the environment. Hazardous materials have certain chemical, physical, or infectious properties that cause them to be considered hazardous. The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). Hazardous materials are defined in the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 101(14), and also in the California Code of Regulations, Title 22, Chapter 11, Article 2, Section 66261, which provides the following definition:

> *A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.*

The proposed project would involve limited transport, storage, use, and disposal of hazardous materials during construction, operation and maintenance, and decommissioning activities. Some examples of hazardous materials that may be used during construction, operation and maintenance, and decommissioning activities would include the batteries, hydraulic fluid, diesel fuel, gasoline, propane, antifreeze, dielectric fluids, explosives, herbicides, grease, lubricants, paints, solvents, and adhesives associated with construction equipment and activities. Operation and maintenance of the project would not require as many hazardous materials as construction or decommissioning. All hazardous materials would be transported, stored, handled, and used in accordance with applicable laws, ordinances, regulations and standards (LORS). A summary of hazardous materials that could be used for the proposed project is presented in **Table 5.7-1**.

TABLE 5.7-1 HAZARDOUS MATERIALS

Hazardous Material	Typical Quantities[a]	Project Uses
Diesel fuel	Over 5,000 gallons would be stored in aboveground tanks during construction and operation. Diesel fuel would be replenished onsite by commercial vendors as necessary.	Fuel for construction and transportation equipment during construction and decommissioning.
Explosives	Limited quantities necessary to complete the task would be stored onsite. Onsite storage is expected to occur only for limited periods of time and as needed for specific construction activities.	May be necessary during construction for excavation of tower foundations and trenches or for creating construction access, onsite roads, or grade alterations in the underlying volcanic bedrock.
Gasoline	Gasoline would be stored onsite in temporary above ground storage tanks during project construction.	Fuel for some construction equipment and transportation vehicles.
Propane	Approximately 500 to 1,000 gallons stored in an aboveground propane storage vessel. Propane would be replenished onsite by commercial vendors as necessary.	Ambient heating of the O&M building and used to power an emergency generator during operation.
Herbicides	If deemed necessary, herbicides would be brought to the site and applied by a Licensed applicator.	May be used for vegetation control around facilities for fire safety.
Lubricating oils/ grease/hydraulic fluids/gear oils	Limited quantities would be stored in portable containers (capacity of 55 gallons or less) and maintained onsite during all phases of the project.	Lubricating oil would be present in some turbine components, in the diesel engine of the emergency generator, and in engines of construction and transportation equipment.
Glycol-based antifreeze	Limited quantities (10 to 20 gallons of concentrate) would be stored onsite during each phase of the project.	Used in wind turbine components for cooling (approximately 5 to 10 gallons are present in the cooling system for the transmission. Used in the diesel engine for the emergency generator. Used in the engines of construction and operant and maintenance vehicles.
Lead-acid storage batteries and electrolyte solution	Limited quantities of electrolyte solution (<20 gallons) for maintenance of construction and transportation equipment during construction and decommissioning.	Present in construction and transportation equipment. Backup power source for control equipment, tower lighting, and signal transmitters.
Cleaning solvents	Limited quantities or organic solvents (<55 gallons) would be stored onsite during construction and decommissioning to maintain construction and transportation equipment. Limited quantities (<10 gallons) of water-based cleaning solvents would be stored onsite during operation.	Organic solvents would be used for equipment cleaning and maintenance when water-based cleaning and degreasing solvents cannot be used.
Paints and coatings[b]	Limited quantities would be used for touch-up painting during construction (<50 gallons) and for maintenance during operations (<20 gallons).	Used for corrosion control on exterior surfaces of turbine towers.

TABLE 5.7-1 HAZARDOUS MATERIALS

Hazardous Material	Typical Quantities[a]	Project Uses
Dielectric fluids (e.g. synthetic oil and mineral oil)	Some transformers may contain more than 500 gallons of dielectric fluid. Onsite transformers each contain approximately 10,000 gallons of mineral oil. Some equipment may instead contain gaseous dielectric agents (e.g., sulfur hexafluoride) rather than liquid dielectric fluids.	Used in electrical transformers, bushings, and other electric power management devices as an electrical insulator.

Source: Modified from Stantec 2024p TN 254794 – Table 6 Hazardous Materials

Notes:

a) These values represent the total onsite storage capacity, not the total amount of fuel that would be consumed during project construction or operation.

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

c) It is assumed that the majority of transformers, bushings, and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication and would not require dielectric fluid to be added onsite. It is assumed that servicing of electrical devices that involves wholesale removal and replacement of dielectric fluids would not occur onsite and that equipment requiring such servicing would be removed from the site and replaced. New transformers, bushings, or electrical devices are expected to contain mineral oil- based, or synthetic dielectric fluids that are free of polychlorinated biphenyls.

Environmental Contamination

Existing and past land use activities are commonly used as indicators of sites or areas where hazardous material storage and use may have occurred or where potential environmental contamination may exist. For example, many historic and current industrial sites have soil or groundwater contaminated by hazardous substances. Other hazardous materials sources include leaking underground tanks in commercial and rural areas, contaminated surface runoff from polluted sites, and contaminated groundwater plumes.

The Fountain Wind Project (FWP or project) would be located in an unincorporated and rural area of Shasta County. Existing land uses within the project boundaries consist exclusively of timber harvesting. Land uses in the surrounding area primarily include timber harvesting, recreation, rural residential, open space, and cattle ranching.

An Environmental Database Report (EDR) environmental records review was conducted for the project in 2019 that did not identify any hazardous material or known contaminated listings for sites within or immediately adjacent to the proposed project boundary (FWPA TN 248290-2). The only listings identified in the 2019 EDR environmental records search within the current project boundary were two timber harvesting waste discharge permits and a pre-harvest inspection listing. An updated EDR records review was conducted in 2023 for the project site and a 1-mile buffer that revealed only 1 site listing, located within the project site, which consisted of Regional Water Quality Control Board (RWQCB) timber harvesting waste discharge permit and

forestry and silviculture California Emergency Response System listing (FWPA TN 250061). Staff reviewed the State Water Resources Control Board (SWRCB) Geotracker and the Department of Toxic Substances Control (DTSC) EnviroStor websites which did not identify any known hazardous material or environmental contamination sites within or adjacent to the project site (SWRCB 2024; DTSC 2024).

Airports and Aviation Hazards

There are no public or private airports within 2 miles of the proposed project. There are three public airports (Redding Municipal Airport, Benton Airpark, and Fall River Mills Airport) and one private airport (Tews Field-CA53) in Shasta County. The closest airport to the proposed project is the Fall River Mills Airport, located approximately 20 miles northeast of the proposed project (FWPA TN248288-13, DEIR Hazards and Hazardous Materials).

There are several private heliports in Shasta County, including two in Burney - the PG&E Burney Service Center Heliport and the Burney Sheriff's Station Heliport; and three in Redding - the Shasta Regional Medical Heliport, Mercy Medical Center Heliport, and The McConnell Foundation Heliport

The proposed wind turbines have a maximum tip height above ground surface (abg) of 610 feet and could potentially pose an aviation hazard. In July 2021, the Federal Aviation Administration (FAA) conducted aeronautical studies of the originally proposed wind turbine which had a maximum tip height of 679 feet abg. The aeronautical studies found that the formerly proposed wind turbine structures, at the previous maximum tip height of 679 ft abg, would have no substantial adverse effect on safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities (FWPA TN248290-4).

Schools

The nearest school to the proposed project is the Montgomery Creek Elementary School, of the Mountain Union Scholl District, which is located approximately 2 miles from the western boundary of the project (Shasta County 2024).

Emergency Evacuation Routes

The project site would be located in a rural area adjacent to State Route (SR) 299, with two project roads allowing adequate egress/ingress to the site in the event of an emergency. Under the Emergency Operation Plan, the County Sheriff acts as the County Director of Emergency Services and is responsible for determining, in coordination with the on-scene Incident Commander, what level of support is needed from the County for any specific incident and would notify key personnel to staff the Emergency Operations Center based on incident needs. Additionally, the Sheriff is responsible for coordinating and planning evacuation procedures and operations. There are no specifically designated evacuation routes described in the Emergency Operation Plan, Community Wildfire Protection Plan, or the Shasta County General Plan. The area surrounding the

project is a rural area with limited local access roads and with the main access road and potential evacuation route being SR 299, on the north edge of the project.

Wildfire

Wildfires are and have been an important natural process throughout California's history, however recent changes in wildfire locations and increases in frequency, intensity are posing increasing threats to the population and environment of California. More acres in California have burned in the past decade than in the previous nine decades and eight of California's ten largest wildfires between 1932 and 2022 have occurred in the last decade. Wildfires in California have had tragic consequences with nearly 150 fatalities between 2010 and 2022, over 97,000 structures destroyed between 2005 and 2022 (California AG 2022).

Additionally, wildfires in California can have significant, adverse ecological impacts that can result in habitat loss and fragmentation, shifts in vegetative compositions, reductions in small mammal populations, and accelerated loss of predatory species. Wildfire can also have adverse impacts on erosion and water quality. During active burning, ash and associated contaminants can enter water supplies. After large burns, rainstorms can flush vast amounts of sediment from exposed soils into those same water supplies (California AG 2022).

The project would be located within the Shasta-Trinity Unit (SHU) Battalion 2, as defined in CAL FIRE's SHU 2023 Strategic Fire Plan, which describes the areas surrounding the project that could be impacted by wildland fire. Battalion 2 generally is located south of the Pit River arm of Shasta Lake, east of Interstate 5 (I-5) and the City of Redding, north of Whitmore Road, and west of Hatchet Mountain. During the fire season, the CAL FIRE SHU has access to 20 engines, 3 dozers, 12 hand crews, 1 air tactical plane, and 2 air tankers (CAL FIRE and Shasta County 2023).

Wildfire is a natural component in the evolution of vegetation of Shasta County, located centrally in Northern California. Vegetation in the watersheds is characterized by grass and understory vegetation, forest and hardwood litter, dormant brush and slash, and chaparral brush. Shasta County experiences extreme fire weather conditions, especially from May through September (Shasta County 2016).

Fire Hazard Mapping

CalFire Fire Hazard Severity Zones. The California Department of Forestry and Fire Protection (CAL FIRE) identifies and maps areas of significant fire hazards based on fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, typical fire weather for the area, and other relevant factors. The maps identify this information as a series of Fire Hazard Severity Zones (FHSZ), which are progressively ranked in severity as un-zoned, moderate, high, and very high. Fire Hazard Severity Zone maps evaluate "hazard," not "risk"; wildfire "hazard" is based on the physical conditions that create a likelihood and expected fire behavior over a 30 to

50-year period without considering mitigation measures such as home hardening, recent wildfire, or fuel reduction efforts (CAL FIRE 2024).

Wildland Fire Hazard Severity Zones in California are divided into State, local, or federal government responsibility areas. The project site and surrounding area are entirely located with an area designated as a very high FHSZ within a State Responsibility Area (SRA). SRAs includes those areas where the financial responsibility of preventing and suppressing fires falls primarily on the State.

CPUC High Fire Threat District Map. The California Public Utilities Commission (CPUC) has adopted over the last two decades a series of fire safety rules which includes the preparation of Fire-Threat and High Fire-Threat District (HFTD) Maps and the identification, evaluation, and adoption of more fire-safety regulations for the high fire threat districts. Areas mapped as high fire threat are required (under CPUC General Orders 95, 165, and 166) to have increased patrols along overhead lines, increased vegetation clearances and frequency of vegetation clearance, increased inspections of aerial communications facilities, and increased maintenance and repairs to correct fire hazards. The HFTD maps identify three tiers of fire threat/risk: Tier 1 zones near communities, roads, and utility lines, and are a direct threat to public safety; Tier 2 fire-threat areas outline areas where there is a higher risk (including likelihood and potential impacts on people and property) from utility related wildfires; and Tier 3 fire-threat areas outline areas where there is an extreme risk (including likelihood and potential impacts on people and property) from utility related wildfires. The project and most of the surrounding area is located within areas mapped as Tier 2 Fire Threat District, with an area of Tier 3 High Fire Threat District mapped to the west and southwest of the proposed project encompassing most of the communities of Round Mountain, Oak Run, and Whitmore (CPUC 2024).

Fire History

Shasta County has experienced several major fires in the last 30 years, plus numerous smaller fires each year that were caught in initial stages and contained by aggressive fire suppression or otherwise restrained by less than perfect fire weather conditions (Shasta County 2016). Some of the largest fires in California history have occurred within or included portions of Shasta County including the 2021 Dixie Fire and 2018 Carr Fire, the second and thirteenth largest fires in California history, respectively. The Dixie Fire, which started on July 13, 2021, resulted from a tree falling on PG&E's electrical distribution lines and resulted in one death, destroyed 1,311 structures, and burned more than 963,000 acres in multiple counties. The Carr Fire started on July 23, 2018, near the Carr Powerhouse Road along Highway 299 in Whiskeytown National Recreation Area due to sparks from a flat tire; the fire burned 221,651 acres, destroyed 1,614 structures, and resulted in 8 deaths. The Carr Fire spawned a fire tornado on July 26, 2018, that at times approached a half mile wide and generated winds in excess of 143 mile per hour (mph). The Carr Fire's tornado was ranked a powerful EF-3 on the Enhanced Fujita Scale used to rank tornado strength (Science News Explores 2018).

Additionally, several large fires have occurred in the area of the County where the project is located, including the 1992 Fountain Fire (60,290 acres), the 1998 Burney Fire (3,264 acres), the 2012 Ponderosa Fire (27,676 acres), and the 2014 Eiler Fire (32,416 acres) (CAL FIRE and Shasta County Fire 2023). The August 1992 Fountain Fire occurred in the project area and was a fast-moving fire that burned the northwestern half of the project site (CPUC 2024) and was ignited by a suspected arsonist in dry grass along Buzzard Roost Road in Oak Run. The Fountain Fire destroyed 272 homes and 489 other buildings and killed almost all the trees in the fire's path. Most of the burned timber areas were quickly cleared and reforested with primarily ponderosa pine, Douglas-fir, and white fir, with incense-cedar planted along stream buffers (Zhang et. al. 2008).

While lightening is a common cause for many of the California's largest wildfires, most of the most destructive fires in recent years have been caused by human activities such as downed power lines or electrical sources associated with residential development or industrial facilities (California AG 2022). This is also true in Shasta County, an ignition analysis indicates that human actions of arson and debris burning is a major cause of fires in the Shasta –Trinity area (CAL FIRE and Shasta County Fire 2023). Other leading causes include equipment use, power, lightning, vehicle, undetermined, and miscellaneous (identified ignition does not fit other cause classes). A review of CAL FIRE activity statistics for the SRA within Shasta County for the years of 2012 through 2022, as presented in **Table 5.7-2**, reveals that in Shasta County the leading causes of wildfire ignition are primarily arson, burning debris, undetermined, and vehicles. However, lightening, equipment use, miscellaneous (includes explosives, shooting, and fireworks), and electric power have also been significant causes of wildfires during this period (CAL FIRE 2012 through CAL FIRE 2022a).

TABLE 5.7-2 NUMBER OF WILDFIRES IN SHASTA COUNTY SRA BY CAUSE FROM 2022 THROUGH 2012

Year	Arson	Campfire	Burning Debris	Electric Power	Equip-ment Use	Lighten-ing	Misc.	Playing with Fire	Railroad	Smoking	Undet.	Vehicle
2022	24	2	23	9	21	4	44	3	0	4	9	30
2021	52	7	26	13	24	9	11	4	0	7	7	15
2020	29	8	47	16	18	6	11	2	0	8	13	23
2019	23	11	25	5	8	29	7	2	0	4	14	11
2018	25	6	11	14	19	6	48	2	0	5	37	21
2017	21	2	17	14	11	14	26	6	0	3	22	14
2016	13	5	24	7	6	9	14	2	0	3	22	7
2015	35	5	23	6	13	27	14	6	0	2	31	10
2014	15	7	38	4	15	17	15	4	0	6	25	20
2013	41	3	38	14	11	15	22	6	0	4	45	23
2012	13	7	24	21	16	22	14	3	0	2	42	8

Sources: CalFire Wildfire Activity Statistics, 2012 through 2022.

Wildfire Behavior

Wildfire behavior is influenced by natural conditions (terrain, climate conditions and vegetation) and human influences. Natural conditions and human influences interact to affect fire behavior. Wildfire behavior describes the intensity, flame length, and rate of spread of a single wildfire, while a fire regime describes the average characteristics of wildfire behavior that prevail over long periods of time in a particular region. Several factors influence the behavior of a single fire, including topography, weather conditions, vegetation amount and condition, and the continuity of vegetation. Of course, all of this also depends upon the location and timing of either a human- or lightning-caused wildfire (Ganteaume & Syphard 2018). In other words, wildfire initiation and propagation are complex processes driven by a suite of bottom-up (e.g., topography or weather) and top-down (e.g., climate or distance to development) factors with varying degrees of spatial and temporal dependency.

Extreme wildfire events are those in which conditions line up in a way so that fire behavior is erratic, fast, and largely beyond firefighter control. These types of fires often spread rapidly due to strong winds blowing embers up to a kilometer ahead of the fire front, keeping the fire propagating over large areas (Keeley & Syphard, 2019). Extreme wildfire events have the potential to create rare atmospheric events know as fire tornadoes, fire whirls, or fire storms.

- A fire tornado "initiates its own weather system helping to concentrate the rotation"; as smoke rises and condenses in the upper atmosphere it forms an ice-topped cloud known as a pyro-cumulonimbus or firestorm cloud over the fire vortex. The development of the cloud stretches the underlying column of air, concentrating the rotation near the surface and causing winds to accelerate to tornado strength (Library of Congress 2024).
- A fire whirl as a "spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter." Sometimes, however, a fire whirl occurs that is much larger and stronger than average. More common than fire tornadoes, fire whirls are whirlwinds created by the heat of flames. Fire whirls have also been described as a "vigorous atmospheric circulation, created when highly unstable, superheated, dry air near the ground breaks through the boundary layer and shoots upward in a swirling motion" (Library of Congress 2024).
- A firestorm occurs when heat from a wildfire creates its own wind system. This phenomenon can lead to very strange weather effects. A firestorm can be caused by a wildfire–or multiple wildfires in the same area (Library of Congress 2024).

The project area has a history of large, wind-driven wildfires as discussed above (CAL FIRE and Shasta County Fire 2023). Also as mentioned above, the 2018 Carr Fire, an extreme wildfire event, generated a fire tornado with winds estimated at 143 mph.

Fire regimes have been substantially altered across the state in the last century for different reasons and in different ways (Safford et. al. 2014). The biggest wildfire issue

in the dry mixed conifer forests that characterize the project area is a century or more of fire suppression that has resulted in a long-term increase in surface fuels, including ingrowth of young trees. When fires start in these forests, they are now often burning at uncharacteristically high severity (Safford et. al. 2022). Fuel load also plays a role in grasslands where moist growing season conditions increase grass production that contributes to an accumulation of biomass, which cures early in the season and is a determinate of fire activity later that year or the following year (Littell et. al. 2009). Invasive grasses that have been a huge problem in Southern California are now a growing concern in northern forests, as they are expanding and establishing across disturbed areas (Guiterman et. al. 2022; Kerns et. al. 2020). Many of the largest and most destructive wildfires, such as the 2018 Camp fire, are those that have started in dry grasslands and then rapidly spread through patchworks of grasses, shrubs and dense forest, resulting in both high flammability and high fire intensity (Mass and Ovens 2021). In other words, it is often the confluence of dry, receptive fuel, like grasses, mixed with high-density forests and shrublands that generate ember loads, resulting in spot fires happening kilometers ahead of a fire front during severe fire weather (Maranghides et. al. 2021).

Although human-caused ignitions dominate across most of the state, lightning-caused fires are also a significant ignition source for wildfires in the project area. Historically, frequent lightning strikes would spark fires that spread through the understory shrubs, herbaceous cover, and young trees in the forests, with burns typically at low- to mixed-severity. Because wildfires were not historically extinguished, their high frequency kept the understory vegetation low in stature; thus, fires would rarely have flame lengths high enough to reach into the crowns of the dominant forest species. Older trees typically had thick bark and other adaptations that allowed them to survive these surface fires.

After the initiation of policies to suppress all fire (from the 1930s to the 1970s, fires had to be suppressed by 10am the following day), fires stopped burning in the forests. Without fire to reduce the surface fuel, a high abundance of forest understory vegetation has grown in, with dense shade-tolerant trees, as described previously. If a fire now starts in these forests, the thick and abundant understory (i.e., ladder fuel) can carry the fire up into the crowns of the forest, thereby greatly increasing flame lengths and fire danger during suppression. Furthermore, in areas that have been managed for timber, the homogeneity of the fuel can also lead to more extreme, rapidly spreading fire behavior.

Climate

Climate factors that affect wildfire behavior include short-term weather conditions (temperature, humidity, and precipitation), wind direction and velocity, or weather-related ignition sources such as lightening. Fire weather and fuel conditions at the time of fire ignition are the most obvious concerns when it comes to single fire events that could originate on or surrounding the project. In addition to these short-term weather factors that govern fire behavior on a given day, longer-term seasonal climatic variables

can predict the likelihood for a destructive fire event before or within a given fire season via annual variation in fuel amount or moisture (Keeley & Syphard, 2016). Finally, long-term climate dictates spatial differences in the likelihood of wildfire due to the accumulation of similar weather conditions (Krawchuk & Moritz, 2012).

In the last couple of decades, climate change has increased atmospheric aridity in western U.S. forests, drying fuel and making it more flammable (Abatzoglou & Williams 2016). Many studies have documented significant increases in burned area in correlation with the warmer and drier conditions brought on by climate change (Higuera & Abatzoglou 2021). These relationships between climate and fire are highly significant in the northern and interior forests in California (Williams et. al. 2019). This means that, without any action, the combination of increased forest stand density from fire suppression and lowered fuel moisture from climate change strongly increases the likelihood of an extreme wildfire event in the project area.

Temperature, Humidity and Precipitation

Shasta County generally has warm, dry summers and cool, wet winters. In the project area, the weather is generally warm and dry during the day with moderate humidity recovery at night. Peak summer temperatures average 85 to 95 degrees with temperatures reaching more than 110 degrees for two to five day periods. The average relative humidity is 15 to 35% (CAL FIRE and Shasta County Fire 2023).

Short-term meteorological factors such as temperature, wind, and relative humidity have long been used to calculate different types of fire danger indices, which provide a quantitative prediction of short-term fire potential and behavior (Hardy and Hardy 2007). For example, these indices can be used to assess suppression difficulty, allocate resources, or declare fire bans. Many scientists and managers believe that the number of days having high fire danger will increase with climate change. Summer and fall conditions in Shasta County may frequently lead to high fire danger.

Annual fire activity is more a function of average seasonal variation in factors such as temperature, precipitation, and humidity. Research in California (Keeley & Syphard, 2017) has shown different fire-climate relationships across the state, with the significance and type of climate variable having differential effects depending upon the region. In the North Interior and Sierra Nevada regions, seasonal temperature and precipitation variables had significant correlations with annual area burned. Thus, with increased atmospheric aridity expected with climate change, the climatic potential for wildfire will likely continue to increase in Shasta County in upcoming years, at least until or if large-scale vegetation changes occur.

Wind

Project area winds are generally out of the west, with winds measured at speeds of 4 to 7 miles per hour (mph) or less most of the time. Occasionally light east winds occur in the morning, and winds then shift to a west/southwest direction in the afternoon. During the period of May through October, wind gusts from the west occur with

average wind gust speed of 12 mph in the area (Stantec2023c - TN 253505). North wind events occur periodically throughout the fire season and can reach the 10 to 40 mph range with associated higher gusts. These winds frequently switch to the northeast and strengthen after dark, with occasional stronger winds reaching 50 mph in the Hillcrest/Round Mountain area between 2:00 am and sunrise (CAL FIRE and Shasta County Fire 2023).

In general, most fires become large during severe fire-weather conditions, with strong winds and low fuel moisture, which are also the conditions that increase fire suppression difficulty. Human impacts from wildfire, such as structures or lives lost, typically occur in large wind-driven fires that are difficult to control (Syphard et. al., 2022)

Topography

The terrain of an area (topographic slope and aspect) strongly affects wildfire behavior, and steep terrain can encourage the spread of fire when other factors such as fuels also are present. Fires can spread quickly up vegetated slopes because fuels are pre-heated by rising hot air from the active fire below and the upward drafts can create spot fires upslope (NPS 2024).

The topography of the project area varies from gently rolling hills to relatively steep, low mountains, with elevations ranging from approximately 2,156 feet (657 meters) in the southwestern corner of the Leasehold Area to 6,814 feet (2,077 meters) near Snow Mountain in the southeast corner of the site. Within the project site, steep slopes are present along the North Fork of Little Cow Creek, on the south side of Lookout Mountain, along Cedar Creek, along the South Fork of Montgomery Creek, and along the North Fork of Montgomery Creek.

In many studies documenting the correlates of large wildfires in California, topographic heterogeneity (diversity) is one of the strongest drivers (Syphard et. al. 2019).

Vegetation (Fuels)

Fuels are made up of various components of vegetation, live and dead, that occur on a given site. The SHU 2023 Strategic Fire Plan (CAL FIRE and Shasta County 2023) identifies the forested area east of Redding, which includes the project area, as “Timber East.” Timber East is primarily mixed species conifer forest managed for timber production, however slash (coarse and fine woody debris generated during logging operations) and brush (undergrowth) are part of the fuel component.

The project site is located on privately owned and managed timber lands and the dominant vegetation communities that occur in the project area reflect the existing land use of managed timber lands. As discussed in **Section 5.2, Biological Resources**, the area is dominated by Sierran mixed conifer forest with smaller amounts of mixed montane chaparral, logged areas, mixed montane riparian forest/scrub, and various riparian plant communities. The overstory of conifer dominated areas include a

combination of white fir, Douglas fir, incense cedar, ponderosa pine, sugar pine, and California black oak. The understory shrub and herbaceous vegetation is variable in species composition and cover. The most common species noted include mahala mat green leaf manzanita, bracken fern, and native grasses. In some areas of dense overstory the understory vegetation is sparse.

The three characteristics of vegetation that affect wildfire include fuel load (variable between long-term accumulation of woody fuels and short-term changes in herbaceous fuels), fuel condition (largely a function of vegetation moisture and structure), and fuel continuity, or the extent to which vegetation is uninterrupted or characterized by homogenous fuel conditions (Bond & van Wilgen 1996). While climate directly influences fire activity via effects on fuel load and condition, climate change can independently alter vegetation structure and composition due to physiological limitations of different plant species relative to rapid changes in climatically suitable habitat (Franklin et. al. 2016). In addition, to the extent that climate change will lead to increasing frequency of prolonged drought events, these extended droughts may cause substantial vegetation dieback or tree mortality, thereby indirectly altering fire behavior. With the removal of fire from forests on and near the project area in the last century, many young shade-tolerant trees have established and grown at very high density in the understory such that fire can now spread into the crowns of large, mature tree (Steel et. al. 2015). In addition, this increased stand density increases competition for water resources and can contribute to increased drought-caused tree mortality, which also greatly impacts fire activity (Das AJ 2022).

Human Influences

The project would include the addition of numerous new human influences into the project area. Temporary human influence of the project on wildfire would include: construction of and use of 2 primary access roads from Highway 299 and numerous secondary access roads; construction activities, equipment and crews; blasting activities for construction if deemed necessary; construction of project structures and infrastructure. Permanent human influences on wildfire behavior at the project site would include: the presence of project structures including 48 wind turbine towers with a height of 610 feet from the base to the tip of the 261-foot blade, overhead collector lines, substation, switching station, and the O&M building; the presence of operations and maintenance personnel; the presence and use of access roads.

Human presence is so influential on fire regimes that it can override the effect of climate change in some regions (Syphard et. al. 2017). Although humans put fires out via suppression, humans have also become the dominant source of ignitions in many areas of the globe, and they are the dominant source of ignitions in California (Keeley & Syphard 2018).

Although the population density in Shasta County is much lower than other counties in the state, the population is growing, and there is an increased likelihood for human ignitions to occur. For example, the Carr Fire was started along a nearby roadside, and

in fact, roads are one of the primary locations for human-caused ignitions to occur (Narayanaraj & Wimberly 2011, 2012). The construction of new roads and increase in human activities going into and out of the project site during construction and beyond likely pose a much higher risk of fire than the project itself.

An important consideration relative to ignition is that roadways and other disturbances are a prime location for the rapid establishment of invasive grasses and flashy fuels that ignite very readily and colonize every season (Fusco et. al. 2019, 2021; Nagy et. al. 2018). In other words, after vegetation clearance or within areas that are disturbed, flammable invasive species are often first to colonize, and they thrive in disturbed areas.

Recent research shows disproportionately high human and ecological impacts due to human-caused wildfires (Hantson et. al. 2022; Mietkiewicz et. al. 2020). One reason for that is that human-caused fires can start any time, whereas lightning-caused fires are associated with seasonal weather. Thus, human-caused wildfires can lengthen the fire season, and simply by the law of numbers, are more likely to occur during severe fire weather when most destructive wildfires occur.

Fuel Breaks and Shaded Fuel Breaks

Fire breaks are permanent or temporary strips of bare land or land planted with less flammable vegetation planned to retard fire, including features such as roads. A shaded fuel break is a strip or block of land on which the vegetation, debris and detritus have been reduced and/or modified to control or diminish the risk of the spread of fire crossing the strip or block of land. The 2022 California Forest Practice Rules (CAL FIRE 2022b) defines a shaded fuel break as “Where some trees and other vegetation and fuels are removed to create or maintain a shaded fuel break or defensible space in an area to reduce the potential for wildfires and the damage they might cause. Fuel breaks are created by removing and thinning existing trees or by strategically replanting trees after they have been removed.” Within a shaded fuel break, vegetation is managed to reduce the potential for wildfire damage. The appropriate width of a fuel break is highly dependent on the slope, fuel density, fuel type, fuel arrangement, and landowner (Shasta County 2016).

There are some important considerations relative to fuel break construction within and around a project area. Overall, the effects and effectiveness of fuel breaks greatly depend upon the location and timing of the fire ignition, fire-weather conditions, the landscape context in which the fuel breaks are placed, fuel break maintenance, and available firefighter resources. There is ample scientific evidence to show that, in general, mechanical fuel treatments and prescribed fire in forests that formerly had frequent fires can effectively reduce extreme fire behavior and fire severity, lowering the potential for crown fires (Stephens et. al. 2009). Fuel breaks may also serve as safe spaces for on-the-ground fire control operations (Agee et. al., 2000). Despite these potential benefits, a potential issue is that fires often do not encounter fuel breaks (Rhodes & Baker, 2008) depending upon where they start. Accordingly, multiple studies

show that treating a small portion of an area results in minimal overall reduction in fire risk, exposure of assets to fire, and area burned (Oliveira et. al. 2016; Price et. al. 2012; Syphard et. al. 2011).

As mentioned previously, fuel breaks can lower fire intensity, slow fire spread, and result in some reduced area burned, but these effects are highly dependent upon fire weather and firefighting resources. Fuel breaks rarely passively stop a fire (Gannon et. al. 2023; Syphard, Keeley, et. al. 2011). Thus, unless firefighting resources are present, a drawback, or tradeoff, of constructing open fuel breaks may be the potential for increased flammability resulting from landscape disturbance and the introduction of invasive species.

One of the biggest concerns with the construction of open fuel breaks and vegetation clearance, particularly along roadsides, is the likelihood of introducing herbaceous flashy fuels (Merriam et. al. 2006) to the areas where ignitions are most likely to occur. It is well known that many ignitions start along roadsides (Ganteaume & Syphard 2018; Narayanaraj & Wimberly 2012). Thus, the flammability of the vegetation adjacent to roadsides can mediate the likelihood that a spark turns into wildfire. In other words, although treating areas adjacent to roadways may provide some benefits, like helping with evacuation, there could be trade-offs if the treatments increase the extent and abundance of the flammable invasive herbaceous species that are ubiquitous across California, thereby increasing ignition potential. Recent studies show that invasive grasses are rapidly invading forests, and that forest management activities meant to reduce fire risk are ironically leading to increased flammability and fire spread (Guiterman et. al. 2022; Kerns et. al. 2020; Merriam et. al. 2007).

Shaded fuel breaks, which, particularly if combined with prescribed fire, can also modify fire behavior and increase forest resilience. Although they can modify surface and crown fire behavior, it is again important to consider the landscape context in which they are placed and the extent to which they could reduce fire behavior for how long (Agee et. al. 2000). Research shows that the most effective width of shaded fuel breaks varies depending upon landscape context and fire conditions.

Wildfire Behavior Modeling

Applicant Fire Behavior Modeling. The applicant completed a fire behavior modeling analysis of the impacts of the project in December 2023 (Stantec 2023c - TN253505). The study used standard modeling methodology and programs to predict fire behavior, and the input data included fuel moisture, weather, topography, and fuels information to evaluate fire rate of spread and calculate flame lengths across the site using pre- and post-development conditions of the project. The applicant concluded that, by constructing a road and completing fuel breaks for the project, the project would not increase severe fire behavior, and would lower flame lengths and rate of spread (Stantec 2023c - TN253505).

Staff reviewed the applicant's fire behavior study and found that while their methods were technically sound, they used weather data from a nearby Remote Automatic Weather Station (RAWS) (which may or may not be representative of weather conditions in the future) and conducted their assessments based on "typical fire season" from May to October - with average wind gust speed of 12 mph as their worst-case scenario. Looking at historical wind data in the region, however, wind speeds in Shasta County can often reach 15 – 35 mph and sometimes exceed 70mph.

It is not surprising that the applicant's results show fire intensity and flame lengths declining under average weather conditions. This is because fire behavior is a modeled function of vegetation structure, and the proposed vegetation management and road installations are modifying vegetation structure in ways that should lower fire intensity and slow fire spread. If the roads and fuel modifications were to reduce extreme fire behavior, it is still critical that a fire is detected almost immediately if fire weather conditions are dangerous. That is because, without defensive actions in modified fuel zones, the fire will nevertheless continue to spread – albeit more slowly at lower intensity – across the fuel modifications and into the nearby forests where it could again exhibit extreme behavior. During severe fire weather conditions, a fire can escape control and spread very rapidly often with wind-borne embers flying more than a kilometer ahead of the fire front.

Thus, the primary consideration in terms of the applicant's fire behavior study is that it does not fully account for the range of scenarios that could occur because it only accounts for average weather and wind conditions. Most of the largest and most destructive wildfires are the ones that occur under occasional severe weather conditions. In other words, more important than getting the accurate average conditions is to have a reasonable projection of the worst than average-case scenario, especially given potentially increasing severe fire weather with climate change, forest management, and fuel accumulation nearby.

A more informative study would simulate hypothetical fire behavior resulting from potential ignitions starting along roadsides outside of the immediate project area. One of the common assumptions used in fire behavior modeling is that ignition locations are random. However, fire ignitions are highly spatially structured. Thus, an ignition surface that reflected the most probable locations for human and lighting-caused ignitions, in addition to considering the potential for increased frequency of ignitions, could have provided further insight into possible project impacts. Furthermore, given the tendency for invasive grasses to establish along roadsides and within disturbed areas, simulation of ignitions in grassland fuels could have provided further insight into how fires might start and spread. Additionally, as pointed out by Shasta County (COS 2024k - TN 259437), the PyroAnalysis study fails to account for the continued presence of burnable fuel in the fire breaks, does not evaluate ember spotting in the rate of fire spread, and does not account for changes to wildfire risk due to climate change. Finally, the applicant's fire behavior study does not include evaluation of a worst-case scenario

which would be needed to evaluate behavior under wind speeds that are at least as fast as those in the worst wind-driven fires in this and surrounding regions.

Shasta County Fire Behavior Modeling. Shasta County completed a fire behavior modeling study in November 2024 to analyze the effects of reduced air tanker access to the Project on fire behavior and fire spread during periods of severe fire weather conditions (worst case weather) (COS 2024l – TN 260101). The fire spread analysis conducted by REAX modeled fire spread scenarios for a fire igniting at the outer edge of the project site over two time periods: 6 hours and 24 hours. The 6-hour scenario assumes that there are no flight restrictions in the area, allowing very large air tankers (VLAT) to contribute to the initial attack efforts. The 24-hour scenario represents a larger fire and assumes the presence of flight restrictions, preventing early VLAT suppression.

The scenarios analyzed by REAX incorporated representative conditions of wind and weather that were reported during the 1992 Fountain Fire. Due to climate change, the annual number of days with similar extreme temperatures and periods of drought are likely to become more frequent and severe. REAX states, and staff concurs, that increases in these conditions, along with other factors, would exacerbate fire danger in the region, and thus, evaluating fire behavior scenarios that consider extreme fire weather is reasonable and prudent.

The modeling used an average wind speed value of 15 mph, chosen as a balance between extreme sustained wind conditions and more moderate, frequently experienced gusting speeds. Wind speed and wind direction inputs were modeled to capture the effects of local topography on the wind field and resulted in simulated wind speeds ranging from 3 mph to 56 mph across the project area landscape and then incorporated into the fire spread model (COS 2024l – TN 260101).

The modeling revealed that under the modeled scenarios of two ignition locations near the southwest corner of the project site and near the west central edge of the project, in the 6 hour with no flight restrictions assumed scenario the fire areas range from 275 acres to 660 acres, respectively, and for the 24 hour with flight restrictions scenario the fire area grows significantly and ranges from 7,485 acres to 9,300 acres (COS 2024l – TN 260101).

Staff also reviewed a comment letter from the applicant (PyroAnalysis) regarding the REAX (Shasta County) fire spread modeling (Stantec 2024cc – TN 260271). PyroAnalysis indicates that they feel the qualifications of the analysts that conducted the REAX modeling is inadequate and further notes that the REAX modeling used differing modeling software and differing conditions than their model that may not be appropriate. Staff notes that many fire behavior experts, including professors at universities, such as those that performed the modeling analysis for Shasta County perform sophisticated fire behavior modeling and analysis for the state of California, and publish their work in the peer-reviewed literature, without the specific qualifications listed in the applicant's response letter to the County. Many are also not wildland

firefighters; yet, they have a deep understanding of fire behavior patterns under diverse conditions, and like the County did, are able to incorporate the effect of fire suppression without simulating the actual suppression activities.

Staff reviewed the modeling approach used in the wildfire behavior study produced by REAX (COS 2024l – TN 260101), and from the information provided concluded that the modeling is scientifically sound. The modeling used standard fire spread modeling tools, including FlamMap (https://research.fs.usda.gov/treesearch/25948), FireFamily+, and WindNinja (for high-resolution wind conditions), to simulate fire behavior under two different fire ignition scenarios under assumed effect of two different fire suppression scenarios. FlamMap is a widely accepted modeling application, designed by one of the top fire behavior experts in the world (Mark Finney), and uses Rothermel equations. The objective of the County's modeling was to look at scenarios under moderate-to-severe fuel and weather conditions, which were not considered in the earlier fire spread results from PyroAnalysis for the applicant.

The results of the fire behavior and modeling analysis by REAX for the County do not negate the results of the simulations conducted by PyroAnalysis for the applicant, as discussed above. Regardless of slight differences in platforms or techniques, the primary difference in the two fire behavior modeling experiments is the use of mild to moderate (PyroAnalysis) versus moderate to extreme (REAX) weather conditions. That is, both modeling experiments are legitimate given their model assumptions. Under mild conditions, the fuel breaks would likely have an effect that is consistent with the PyroAnalysis results. Under more extreme weather conditions, the results from REAX are consistent with prior studies and general understanding of the effect of wind (and fuel moisture) on fire behavior. While fuel breaks are often effective at modifying fire behavior in mild to moderate weather conditions (as the PyroAnalysis shows), their effectiveness is often overwhelmed when weather is more severe (Gannon et al. 2023, Urza 2023, Pausas and Keeley 2021). These are the conditions we should be most concerned about because these are the conditions when most wildfire damage is done (Keeley and Syphard 2019, Syphard et al. 2022, Bowman et al. 2017).

The REAX analysis for Shasta County notes that despite the applicant's assertion that wildfire risk would decrease once the project is complete, largely based on the assumption that increased access, vegetation removal and fuels reduction (i.e., from newly constructed roadways, shaded fuel break implementation, and fuel clearance zones around the turbines) would contribute to wildfire mitigation, a significant challenge to the effectiveness of these fuel breaks remains – ember spotting. Ember spotting is a behavior common in severe wildfires, where embers jump ahead of the main fire front creating new ignitions. Spotting has allowed fires to "jump" roadways and fuel breaks in multiple California wildfires, notably including the 2024 Park Fire and the 1992 Fountain Fire (COS 2024l – TN 260101).

Regulatory

Laws, Ordinances, Regulations and Standards (LORS) related to hazardous materials, aviation safety, hazards, and wildfire are summarized below. Details regarding all federal, state and local LORS that apply to the project are included. Staff's analysis of project compliance with these LORS is presented in **Table 5.7-3**.

Federal

Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 et seq.) authorizes the US Environmental Protection Agency (USEPA) to control hazardous waste from "cradle to grave" (generation, transportation, treatment, storage, and disposal). The USEPA approved California's RCRA program, referred to as the Hazardous Waste Control Law (Health and Safety Code §25100 et seq.) in 1992.

Toxic Substances Control Act. The Toxic Substances Control Act (TSCA) (15 U.S.C. § 2601 2692) authorizes the USEPA to require reporting, record-keeping, testing requirements, and restrictions related to chemical substances and/or mixtures. It also addresses production, importation, use, and disposal of specific chemicals, such as poly-chlorinated biphenyls (PCBs), asbestos-containing materials, lead-based paint, and petroleum.

Comprehensive Environmental Response, Compensation, and Liability Act. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. § 9601 et seq), including the Superfund program, provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

SPCC Rule. As part of the Clean Water Act (CWA), the U.S. EPA oversees and enforces the Oil Pollution Prevention regulation contained in Title 40 of the Code of Federal Regulations, Part 112, which is often referred to as the "SPCC rule" because the regulations describe the requirements for facilities to prepare, amend, and implement Spill Prevention, Control, and Countermeasure (SPCC) Plans. A facility is subject to SPCC regulations if a single oil (or gasoline, or diesel fuel) storage tank has a capacity greater than 660 gallons, or the total above ground oil storage capacity exceeds 1,320 gallons, or the underground oil storage capacity exceeds 42,000 gallons, and if, due to its location, the facility could reasonably be expected to discharge oil into or upon the "Navigable Waters" of the United States.

Hazardous Materials Transportation Act. The Department of Transportation (DOT), in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to safe storage and transportation of hazardous materials under the Hazardous Materials Transportation Act (HMTA) 49 U.S.C. 5101-5128. DOT regulations implementing the Act (49 CFR parts 171-180), regulate the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials. This also

include regulations relevant to the storage of explosives, as well as the packaging, labeling, materials compatibility, driver qualificators, and safety of transported explosives.

Federal Aviation Administration. The FAA Part 77—Safe, Efficient Use, And Preservation of The Navigable Airspace (49 CFR Part 77) establishes standards and notification requirements for objects that may impact navigable airspace. Airports and navigable airspace that are not administered by the Department of Defense (DOD) are under the jurisdiction of the FAA. This regulation includes: (a) FAA notification requirements for proposed construction, or the alteration of existing structures, that meet specific standards; (b) the standards used to determine obstructions to air navigation, and navigational and communication facilities; (c) the process for aeronautical studies of obstruction to air navigation or navigational facilities to determine the effect on the safe and efficient use of navigable airspace, air navigation facilities or equipment; and (d) the process to petition the FAA for discretionary review of determinations, revisions, and extensions of determinations. Additionally, FAA standards and Advisory Circular 70/7460-1L generally require any temporary or permanent structure, including appurtenances, that exceeds an overall height of 200 feet above ground level (AGL) to meet the requirements to be marked and/or lighted.

State

California Hazardous Waste Control Law. The California Hazardous Waste Control Law (HWCL) is administered by California Environmental Protection Agency (CalEPA) to regulate hazardous wastes. The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Department of Toxic Substance Control. The California Department of Toxic Substances Control (DTSC) is a department of CalEPA and is the primary agency in California that regulates hazardous waste, cleans-up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. The hazardous waste regulations overseen by DTSC establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous waste that cannot be disposed of in landfills.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. Regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) address six elements: hazardous waste generators and hazardous waste on-site treatment; underground storage tanks; aboveground storage tanks; hazardous materials release response plans

and inventories; risk management and prevention programs; and Unified Fire Code hazardous materials management plans and inventories. The Unified Program requires CalEPA to certify local government agencies, known as Certified Unified Program Agencies (CUPAs) as able to implement all the required environmental programs and to consolidate, coordinate and make them consistent within their jurisdiction. State partner agencies involved in the implementation of the Unified Program and providing technical assistance to CUPAs include CalEPA, CalFire, DTSC, and SWRCB. The CUPA for the Project area is the Shasta County Environmental Health Division.

Hazardous Materials Release Response Plans and Inventory Law. The California Hazardous Materials Release Response Plan and Inventory Law of 1985 (Business Plan Act, Health and Safety Code §25500 et seq.) requires businesses that store or use hazardous materials to prepare a Hazardous Materials Business Plan (HMBP) and submit it to the CUPA. An HMBP includes details of a facility and business conducted at the site, an inventory of hazardous materials that are handled and stored on-site, an emergency response plan, and a safety and emergency response training program for new employees with an annual refresher course.

The Aboveground Petroleum Storage Act Program. The aboveground program requires tank facilities storing greater than 1,320 gallons of petroleum that stores any amount of petroleum, to develop and implement the SPCC Plan requirements (CFR 2023). A tank facility is any tank or tanks that are aboveground, including connected piping, that contain petroleum and are used by an owner or operator at a single location or site, is in secondary containment, and it is used to hold oil. The CUPA regulates businesses storing petroleum in aboveground containers or tanks (California Health & Safety Code, Chapter 6.67, Sections 25270-25270.13).

Porter-Cologne Water Quality Act. The Porter-Cologne Water Quality Act is a state law that provides a comprehensive water quality management system for the protection of California waters. The act designated the SWRCB as the ultimate authority over state water rights and water quality policy, and also established nine RWQCBs to oversee water quality on a day-to-day basis at the local and regional level.

California Department of Industrial Relations, Division of Occupational Safety and Health Administration. The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety. They oversee the handling and use of hazardous materials (8 CCR Sections 5139-5223) and, and the protection of workers exposed to wildfire smoke (8 CCR Section 5141.1). Cal/OSHA standards are generally more stringent than federal regulations. Under Sections 337-3339, employers are required to monitor worker exposure to listed hazardous substances and notify workers of exposure. The regulations under Sections 337-339 specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. Section 5141.1 requires identification or harmful exposures, a system for communicating wildfire smoke hazards, and training and instruction about wildfire smoke hazards.

California Highway Patrol. California Highway Patrol is the primary agency responsible for enforcing the regulations related to the transport of hazardous materials on California roads and highway (13 CCR 1160-1167).

California Public Resources Code – Fire Protection. The California Public Resources Code (PRC) Division 4, Part 2 – Protection of Forest, Range, and Forage Lands includes prohibited activities, fire safety and prevention provisions that apply to SRAs, forested areas, timber harvesting areas, and high fire danger areas.

PRC Section 4292 states that any person that owns, controls, operates, or maintains any electrical transmission or distribution line has primary responsibility for fire protection of such areas, and shall maintain around and adjacent to any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet in each direction from the outer circumference of such a pole or tower. PRC section 4293 states that any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or in forest-covered land, or grass covered land which has primary responsibility for the fire protection of such area, shall maintain a clearance of the respective distances.

PRC section 4119 authorizes CAL FIRE or its authorized agent to inspect properties to determine whether they comply with state forest and fire laws, regulations, or use permits. Section 4427 limits the use of any motor, engine, boiler, stationary equipment, welding equipment, cutting torches, tarpots, or grinding devices which may generate a spark or flame if the equipment is located on or near forested land or land covered in bush or grass. It also establishes requirements such as clearing flammable material within 10 feet of the area of operation, as well as carrying of fire response equipment such as a shovel, backpack pump water type fire extinguisher. Section 4428 requires certain firefighting equipment to be used when operating internal combustion engines on or near land covered by forest bush or grass between April 1 and December 1 of any year, or other times when ground litter and vegetation could sustain combustion and facilitate the spread of fire.

PRC section 4431 requires users of gasoline-fueled internal combustion-powered equipment located within 25 feet of forest, brush, or grass to keep firefighting tools at the immediate location of use. Section 4442 restricts the use and operation of any internal combustion engine that uses hydrocarbon fuels on any forest, brush, or grass areas unless the engine is equipped with a spark arrestor, as defined section 4442(c) and pursuant to section 4443.

Z'Berg-Nejedly Forest Practice Act of 1973. The Z'Berg-Nejedly Forest Practice Act of 1973 (PRC Sections 4511–4360.2) and its implementing regulations, the California Forest Practice Rules (14 Cal. Code Regs. Section 895, etc.), govern the management of privately owned forestlands in California, including requisite measures for fire prevention and control, for soil erosion control, for site preparation that involves disturbance of soil or burning of vegetation following timber harvesting activities, for

water quality and watershed control, for flood control, erosion controls, such as drainage facilities, soil stabilization treatments, road and landing abandonment, removal and treatment of watercourse crossings, and any other features or actions to reduce surface erosion, gullying, channel erosion, and mass erosion.

California Public Utilities Commission General Orders - General Orders 95, 165, and 166. The California Public Utilities Commission (CPUC) regulates private investor-owned utilities in the state of California. The following CPUC General Orders are applicable to the project.

General Order 95. CPUC General Order 95 applies to construction and reconstruction of overhead electric lines. General Order 95 includes Rules which apply to overhead electric lines located in Tier 2 or Tier 3 High Fire Threat Districts (HFTDs), which include corrective actions, maintenance, increased inspection, vegetation management to establish clearances, and establishment of minimum vertical, horizontal, and radial clearances of wires from other wires.

General Order 165. General Order 165 establishes requirements for the inspection of electric distribution and transmission facilities that are not contained within a substation. A “Patrol” inspection, defined as a simple visual inspection of utility equipment and structures that is designed to identify obvious structural problems and hazards, must be performed at least once per year for each piece of equipment and structure. “Detailed” inspections, where individual pieces of equipment and structures are carefully examined, are required every 5 years for all overhead conductor and cables, transformers, switching/protective devices, and regulators/capacitors. A utility subject to this General Order must submit an annual report of its inspections by July 1 of each year for the previous year.

General Order 166. General Order 166 requires that Investor Owned Utilities (IOUs) develop a Fire Prevention Plan, which describes measures that the electric utility will implement to mitigate the threat of power line fires. Under General Order 166 the IOUs are required to outline a plan to mitigate power line fires when wind conditions exceed the structural design standards of the line during a Red Flag Warning in a high fire threat area. IOUs are also required to prepare an emergency response plan. Further, utilities are required to report annually to the CPUC regarding compliance with General Order 166.

Defensible Space and the Fire Safe Regulations. State law requires a minimum clearance (defensible space) of 100-feet around structures (Pub. Res. Code §§4290, 4291). Implementing regulations (the “Fire Safe Regulations”) provide related requirements to be implemented in a SRA including road standards for fire equipment access (14 Cal. Code Regs. §1273 et seq.); standards for signs identifying streets, roads, and buildings (14 Cal. Code Regs. §1274 et seq.); requirements for minimum private water supply reserves for emergency fire use (14 Cal. Code Regs. §1275 et seq.); and requirements for fuel breaks such as defensible space and greenbelts (14 Cal. Code Regs. §§1272, 1276 et seq.).

Local

Shasta County Environmental Health Division (CUPA). The Shasta County Environmental Health Division (SCEHD) is responsible for the enforcement of pertinent California health laws, rules, regulations, and Shasta County Ordinances to protect public health, safety, and the environment. The Shasta County Environmental Health Division has been designated as the CUPA for Shasta County by CalEPA. The CUPA provides inspections, permitting, and enforcement for the following Programs administered throughout the County of Shasta and its incorporated cities: the Aboveground Petroleum Storage/SPCC Plan, California Accidental Release Prevention Program (CalARP), California Environmental Reporting System (CERS), Hazardous Material Area Plan, Hazardous Waste, Hazmat Business Plans, Online Hazardous Material Reporting, and underground tanks.

Shasta County General Plan. Section 5.6, Hazardous Materials, of the Shasta County General Plan describes the following objectives and policies regarding hazardous materials that relate to the Project (Shasta County, 2018a).

Objective HM-1: Protection of life and property from contact with hazardous materials through site design and land use regulations and storage and transportation standards.

Objective HM-2: Protection of life and property in the event of the accidental release of hazardous materials through emergency preparedness planning.

Policy HM-c: Shasta County shall adopt policies for hazardous materials use, transportation, storage and disposal as required by State laws.

Policy HM-d: Shasta County shall adopt policies for the protection of life and property from contact with hazardous materials through site design and land use regulations.

Shasta County General Plan Chapter 5.4, Fire Safety and Sheriff Protection, “discusses conditions and issues relevant to the protection of public health and safety from fire damage” (Shasta County, 2018b). The following objectives and policies are applicable to the proposed Project.

Objective FS-1: Protect development from wildland and non-wildland fires by requiring new development projects to incorporate effective site and building design measures commensurate with level of potential risk presented by such a hazard and by discouraging and/or preventing development from locating in high-risk fire hazard areas.

Policy FS-a: All new land use projects shall conform to the County Fire Safety Standards.

Policy FS-b: Known fire hazard information should be reported as part of every General Plan amendment, zone change, use permit, variance, building site approval, and all

other land development applications subject to the requirements of the California Environmental Quality Act (CEQA).

Shasta Community Wildfire Protection Plan. The Western Shasta Resource Conservation District (WSRCD) has established a Community Wildfire Protection Plan (CWPP) for areas within Battalion 2. The goal of the CWPP is to reduce the destruction and associated costs from wildfire by creating shaded fuel breaks, increase homeowner and fire department access and egress, watershed restoration and public information and education on developing Firewise Communities. Several shaded fuel breaks along county roads and SR 299 East surrounding the communities of Oak Run, Hillcrest, Montgomery Creek, and Round Mountain have been initiated by WSRCD (Shasta County, 2016). According to Map 1 in the CWPP, only a small southern portion of the Project Site would be located within the CWPP designated area in Cow Creek. The majority of the northern portion of the Project Site is within an area undesignated within the CWPP (Shasta County, 2016).

Shasta County Multi-Jurisdictional Hazard Mitigation Plan. The Shasta County Multi-Jurisdictional Hazard Mitigation Plan (SCHMP) includes resources and information to assist in planning for hazards, including wildfire. The SCHMP provides a list of actions that may assist participating jurisdictions in reducing risk and preventing loss from future wildfire hazard events (Shasta County 2023).

Cumulative

Cumulative projects are identified as past projects, current projects, or reasonably foreseeable future projects that, when viewed in connection with the proposed Project, cause its effect(s) on hazards, hazardous materials, and wildfire to be potentially significant. A master list of cumulative projects located within the study area is provided in **Appendix 1, Table 1-2**.

The geographic extent for the analysis of cumulative impacts related to hazards and haz-ardous materials is limited to the immediate vicinity surrounding the project as the project hazards and haz-ardous materials impacts are limited to the project site and immediately adjacent areas and hazards and similar impacts of other past, present, and reasonably foreseeable future projects that would have the potential to occur would also be limited to their respective project sites and immediately adjacent properties. Therefore, a review of the cumulative projects list did not identify any projects with potential cumulative effects relative to Hazards and Hazardous Materials.

The area for cumulative impacts related to wildfire are lands within the Timber East area of the Shasta-Trinity Unit that are categorized as high to very high FHSZ in the SRA. The review of the cumulative project list in **Appendix 1, Table 1-2** identified the cumulative sites 7, 9, 12 though-20, 22, and 24 as being within the cumulative impacts area identified above and having existing or future activities that could result in triggering or exacerbating wildfire impacts. These projects are planned, approved, or under construction and, given their physical proximity to the project area and project

type, could potentially contribute to the same wildfire environmental effects as the proposed project.

5.7.2 Environmental Impacts

HAZARDS, HAZARDOUS MATERIALS, AND WILDFIRE	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b. Would the project 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. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Would the project 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?	☐	☐	☐	☒
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 or excessive noise for people residing or working in the project area?	☐	☒	☐	☐
f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☒	☐	☐

HAZARDS, HAZARDOUS MATERIALS, AND WILDFIRE	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
h. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
i. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
ii. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒	☐	☐
iii. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☒	☐	☐
iv. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☒	☐	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, hazards and hazardous materials and wildfire.

5.7.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

Hazards and Hazardous Materials

The hazardous materials analyzed include those potentially existing on the site and those that would be used as part of project construction, operations and maintenance, and decommissioning. Potential existing hazards were assessed based on review of information online and in state hazard databases and maps for the project area.

Some hazardous materials would be used on a short-term basis during construction and decommissioning. Others would be stored on-site for use during operations and maintenance. Therefore, this analysis examines the choice and amount of chemicals to

be used, how the project would use the chemicals, how they would be transported to the facility, and how the project plans to store the materials on-site.

Wildfire

Data on local fuel conditions, weather conditions, and historic ignition sources are used to help determine the potential for damaging impacts to occur as a result of a project-caused wildfire or project impacts on existing wildfire. Wildfire-related environmental data including weather, fuels, topography, fire history, and wildfire history were derived from publicly available regional weather data to evaluate the potential for adverse direct and indirect impacts to occur as a result of project construction, operation, and maintenance.

Additionally, fire suppression resource information, including number of fire stations and locations and aerial firefighting resources from CalFire, the SCFD, and Shasta County, and the availability and proximity of water sources for fire containment and suppression were included in the assessment.

Although primarily focused on development projects in the wildland-urban interface, a wildfire CEQA guidance document published by the California Attorney General (AG) (2022) titled "B*est Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act*" was reviewed and information pertinent to FWP utilized in this assessment.

Thresholds of Significance

A threshold of significance is the line at which a project's environmental impact becomes severe enough that mitigation is required to reduce that impact below the significance line. Impact categories based on the CEQA Environmental Checklist, Appendix G, of the CEQA Guidelines are considered to evaluate if the relevant project impacts are to a degree requiring mitigation.

A threshold of significance may be an identifiable quantitative, qualitative or performance level of a particular environmental effect, and the non-compliance therewith means the effect will normally be determined to be significant by the agency.

5.7.2.2 Direct and Indirect Impacts

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Construction

Less Than Significant with Mitigation Incorporated. During construction of the project, common hazardous substances typical of construction projects would be transported to, used, and stored at the project site. Hazardous materials such as gasoline and diesel fuel, oils and lubricants, hydraulic fluid, solvents, batteries, paints and coatings, and

glycol-based antifreeze would be used in construction activities, construction equipment, and vehicles. **Table 5.7-1** presents the hazardous materials likely to be used on the project site and their anticipated uses. Any hazardous materials would be stored in designated construction staging areas in compliance with LORS, when not in use. Temporary containment berms would also be used to help contain any spills during the construction of the project.

The project would store and use large quantities of fuels and would prepare a construction specific Spill Prevention Control and Countermeasures Plan (SPCC) prior to construction. The construction specific SPCC would lay out the proper procedures to help prevent a discharge of petroleum products, as well as control a discharge should one occur during construction at the project site. Therefore, staff proposes Condition of Certification (COC) **HAZ-1** which would require the submission of a construction specific SPCC to the Shasta County Environmental Health Division for review and comment and to the Compliance Project Manager (CPM) for review and approval. Additionally, staff proposed **WORKER SAFETY-1** includes construction worker safety programs to protect workers from exposure to hazardous material and waste.

Small quantities of hazardous waste would likely be generated during construction and may include waste paint, spent construction solvents, waste cleaners, waste oil, oily rages, waste batteries, and spent welding materials. During construction, waste disposal and collection receptacles would be located on-site for proper disposal of hazardous materials. Hazardous waste storage, handling, and disposal would comply with applicable DTSC regulations.

As the Fountain Wind project disturbs greater than one acre, they will be required to obtain a Construction Stormwater General Permit from the SWRCB and would subsequently be required to prepare a construction Stormwater Pollution Prevention Plan (SWPPP), as discussed in further detail in **Section 5.16, Water Resources**. The SWPPP will be prepared based on SWRCB requirements (and local RWQCB requirements, as appropriate), and would describe hazardous materials onsite, and contain best management practices for storage, handling, and disposal of hazardous materials. Staff has also recommended COCs **WATER-1** and **WATER-2** to ensure compliance with SWRCB SWPPP requirements.

Operation

Less Than Significant with Mitigation Incorporated. Project operation and maintenance activities would transport, use, and store a variety of hazardous materials, including diesel fuel, propane, lubricating oils, dielectric fluids, batteries, and herbicides. The project would prepare a HMBP and a SPCC plan prior to operation. The preparation of the HMBP would ensure that first responders know where and what hazardous materials are located on the project site. The SPCC would lay out the proper procedures to help prevent a discharge of petroleum products, as well as control a discharge should one occur at the project site. Therefore, staff proposes COC **HAZ-2** which would require the submission of the HMBP and SPCC to the Shasta County Environmental

Health Division for review and comment and to the CPM for review and approval. Additionally, since the HMBP only needs to be updated once a year, staff proposes COC **HAZ-3**. This would require the project to notify and seek approval from the CPM about any new hazardous materials before using and storing them onsite. Additionally, staff proposed **WORKER SAFETY-2** includes operations and maintenance worker safety programs to protect workers from exposure to hazardous material and waste.

b. Would the project 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?

Construction

Less Than Significant with Mitigation Incorporated. As discussed above, project construction activities will involve the transportation to, and use and storage of hazardous materials at the project site. Gasoline and diesel fuel, oils and lubricants, hydraulic fluid, and solvents glycol-based antifreeze, would be used in construction activities, construction equipment, and vehicles. **Table 5.7-1** presents common hazardous materials to be used on the project site and their anticipated uses. These materials would be stored in construction staging and laydown yards and temporary berms would help contain spills during project construction. Improper use and storage of these materials could lead to leaks and spills potentially resulting in worker exposure or environmental contamination. Most spills and leaks would be limited in size and easily cleaned up with spill kits due to the small quantities involved. Hazardous materials would be stored and used in compliance with LORS. Staff recommends Conditions of Certification **HAZ-1** which would ensure preparation of a construction SPPC Plan which would address procedures to prevent releases of petroleum products, cleanup of releases should they occur, and release reporting requirements. The construction SPCC would be submitted to the Shasta County Environmental Health Division for review and comment and to the CPM for review and approval. Additionally, staff proposed **WORKER SAFETY-1** includes construction worker safety programs to protect workers from exposure to hazardous material and waste.

The Project would require coverage under the Construction General Permit, and thus would be subject to the protections included in a SWPPP, which would outline BMPs to contain potential releases. As noted above, details related to the construction SWPPP are discussed in Section 5.16 - Water Resources, and staff has recommended COCs **WATER-1** and **WATER-2** to ensure compliance with SWRCB SWPPP requirements and submittal of the SWPPP and related compliance to the CPM for review.

Operation

Less Than Significant with Mitigation Incorporated. Project operation and maintenance activities would transport, use, and store a variety of hazardous materials, including diesel fuel, lubricating oils, dielectric fluids, and cleaning solvents, as discussed in **Table**

5.7-1 Improper use and storage of these materials could lead to leaks and spills potentially resulting in worker exposure or environmental contamination. Staff proposed COCs **HAZ-2** and **HAZ-3** would ensure that the preparation of project specific operations HMBP and SPPC Plans which would address procedures to prevent releases, clean them up should they occur, and release reporting requirements, and ensure conformance with applicable LORS. Additionally, staff proposed **WORKER SAFETY-2** includes operations and maintenance worker safety programs to protect workers from exposure to hazardous material and waste.

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Construction and Operation

No Impact. No existing or proposed schools are located within one-quarter mile of the site. The proposed project would not use acutely hazardous materials (as listed in 8 CCR §5189 Appendix A). Therefore, the project would not result in hazardous materials impacts to existing or proposed schools.

d. Would the project 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 and Operation

No Impact. The project site is not located on or adjacent to any listed hazardous materials sites (FWPA TN 248290-2, FWPA TN 250061, SWRCB 2024, DTSC 2024). Therefore, there is no potential impact to the public or environment from known existing hazardous materials site.

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 or excessive noise for people residing or working in the project area?

Construction and Operation

Less Than Significant with Mitigation Incorporated. The project is not within 2 miles of any public airports, public use airports, or with an airport land use plan. However, the wind turbines and the METs for the project are taller than 200 feet and could potentially represent an aviation safety hazard. Although, the project previously submitted the project to the FAA for aeronautical studies in July 2021, these studies were completed for the previous project layout and wind turbine tip elevation. The FAA concluded that at the previous maximum tip height of 679 ft abg the project would have no substantial adverse effect on safe and efficient utilization of the navigable airspace by aircraft or on

the operation of air navigation facilities. However, this determination of no hazard was made in July 2021 and subsequently extended only to January 2023. To ensure that the project's wind turbines and MET locations and elevations do not pose a hazard, staff proposes COC **HAZ-5** to ensure compliance with FAA regulations and standards.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Construction and Operation

Less Than Significant Impact. There are no specifically designated evacuation routes described in the Emergency Operation Plan, Community Wildfire Protection Plan, or the Shasta County General Plan. The County Sheriff is responsible for coordinating and planning evacuation procedures and operations under the County's Emergency Operations Plan. The project is located in a rural area adjacent to State Route (SR) 299 which serves as the main evacuation route in the area, with two primary access roads from SR 299 allowing adequate egress/ingress to the site in the event of an emergency and additional onsite access roads to be constructed that would allow egress/ingress to other parts of the project site.

The project would not require closures of public roads for project construction or operation. Emergency vehicles would also maintain their right of way during project construction and operation activities. For more information refer to **Section 5.14, Transportation.**

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Construction and Operation

Less Than Significant with Mitigation Incorporated. The project site is located within an area mapped by CAL FIRE as a very high FHSZ and the CPUC maps the area as a Tier 2 HFTD, and therefore could potentially expose people to adverse effects of wildland fires. Further discussion of impacts of wildland fires is included below under criterion h) (i) through (iv). Staff has proposed COCs **HAZ-5** through **HAZ-10**, to ensure compliance with LORS related to fire prevention and wildfire and to reduce impacts related to wildfire.

h. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

i. Substantially impair an adopted emergency response plan or emergency evacuation plan?

Construction and Operation - Evacuation and Ground Emergency Response

Less Than Significant Impact with Mitigation Incorporated. As discussed above under criterion (f), there are no specifically designated evacuation routes described in the Emergency Operation Plan, Community Wildfire Protection Plan, or the Shasta County General Plan. The project is located in a rural area with limited access roads. Access to the project site would be from two access roads along Highway 299, which serves as the main access/evacuation route in the area, and which would provide adequate egress/ingress to the project site in the event of an emergency or wildfire. The additional onsite access roads that would be constructed for the project would allow egress/ingress of emergency personnel to other parts of the project site. The project access roads would also serve as fire breaks to slow down onsite wildfire. Additionally, the roads could be used as staging locations for firefighting equipment and personnel.

As discussed above, the project would not require closures of public roads. Therefore, the project construction and operation activities would not interfere with an emergency response effort. Additionally, COC **HAZ-5** shall be implemented to ensure easy location of and access within the project site, resulting in a less than significant impact.

Operation - Aerial Firefighting

Significant and Unavoidable Impact. CAL FIRE commonly uses a mix of aerial and ground firefighting to control and contain wildfires. The CAL FIRE Shasta-Trinity Unit (SHU) typically dispatches the following resources to a wildfire that occurs during high fire danger periods: 1 battalion chief, 6 Type 3 engines, 2 hand crews, 2 bulldozers, 1 water tender, 1 air attack plane, 2 air tankers, and 2 helicopters (CEC 2024h – TN 254875, CALFIRE 2024d – TN 259802). High fire danger periods are determined by CAL FIRE using the "Indices of the Day" model which identifies low, medium, and high fire danger using a combination of factors including weather conditions and fuel moisture (CEC 2024h – TN 254875). CAL FIRE Battalion Chief and Shasta County Fire Chief (Chief) Sean O'Hara indicated that due to the prevalent high heat and low humidity conditions during "fire season" the area is almost always designated as a high fire danger (CEC 2024h – TN 254875).

In the event of a large wildfire in the project area, Chief O'Hara indicated that CAL FIRE/SCFD would deploy ground firefighting crews and the incident commander would work with the CAL FIRE Air Tactical Group (ATG) to deploy aerial firefighting assets (fixed winged aircraft and helicopters). The ATG supervisor would be in command of aerial assets during a wildfire. This supervisor would determine whether aerial assets could be used safely in the area and this assessment would depend on the terrain and the fire and weather conditions involved (CEC 2024i - TN 254899). If determined necessary by the ATG supervisor, additional aerial firefighting resources could be brought in from other air attack bases (CEC 2024h – TN 254875).

The project would include 48 wind turbines with maximum tip height of 610 feet abg and 3 MET towers with heights of up to 394 feet abg located throughout the project site. An existing PG&E 230 kV transmission line crosses the approximate middle of the project site in a general east-west orientation. Per FAA regulations the wind turbines

and MET towers would include lights for visibility. The planned wind turbine layout places the turbines in ten "rows" with the number of turbines per "row" varying from 2 to 10 turbines. The turbine "rows" are nearly but not quite parallel in a general northwest-southeast orientation with the distances between the rows varying from approximately 0.4 to 1.3 miles (FWPA TN 248330-2); the MET towers are located in close proximity to three of the turbine "rows". The wind turbines are mostly in short straight sub-parallel alignments, not in long straight parallel alignments. The Applicant will provide GIS data of the wind turbine locations to be added to the local and national hazard maps. Chief O'Hara acknowledged the wind towers would be added to the local and national hazard maps but also stated that "this does not remove the impediment to aerial firefighting, it just identifies (the wind tower locations)" (CEC 2024i – TN 254899). On October 24, 2024, CAL FIRE issued a letter that acknowledges that this statement by Chief O'Hara reflects CAL FIRE's formal position or is a statement of fact regarding the utility of mapping wind tower locations (CALFIRE 2024d – TN 259802).

The project's impacts on aerial firefighting have been a subject of much debate and the proceeding's docket contains multiple filings on the topic. Staff reviewed the relevant filings and conducted an independent analysis specifically on this issue which included consulting with the CAL FIRE Unit and Shasta County Fire Department Chief Sean O'Hara and CAL FIRE Chief Jake Sjolund of CAL FIRE Tactical Air Operations. Staff also had extensive discussions with the applicant on wildfire issues. (Records of Conversations summarizing these discussions can be found in the project docket at TN 254899 and 255058.) Staff reviewed a report filed by the applicant's wildfire consultant, PyroAnalysis, dated December 2, 2023, (Stantec 2023c TN 253505) and a supplemental letter report by PyroAnalysis, dated April 2024, addressing information obtained by CEC staff from Chief O'Hara (Stantec 2024u - TN 255883). In the December 2023 report PyroAnalysis stated (Stantec 2023c TN 253505, p. 23),

> *PyroAnalysis finds that the immediate access provided by the road systems into the wind farm, the fuel modifications created by the roads and shaded fuel breaks, and the 2.5 acres of vegetation removed from around the turbines far outweigh the limited restrictions that the project may have on the use of fixed-wing air resources.*

Additionally in the April 2024 report PyroAnalysis stated (Stantec 2024u – TN 255883, p. 9),

> *In addition, the 2.5 acres of fuel reduction around the turbine would assist in minimizing the need for aircraft to operate near the turbines. The new access roads constructed by this Project will provide unprecedented access to the Project site for firefighting vehicles. In addition, the Project would create a system of shaded fuel breaks which, together with the access roads, will result in a landscape that is much more fire-resistant than current conditions. The benefits of these new landscape features will far outweigh the limitations to fix-wing aircraft caused by the presence of the turbines.*

Based on independent analysis, staff disagrees that in this case, ground-based wildfire mitigation strategies adequately offset the reduced aerial capabilities resulting from the

scattered layout of these large turbines throughout the project site. Staff does not agree with the underlying premise in the report that activities to improve ground-based firefighting are credited against impacts to aerial firefighting. The project's impacts to aerial firefighting entail a separate analysis that just considers the significance of those impacts regardless of other project mitigation. To the extent significant impacts are unmitigable, other benefits from the project can be considered in an override analysis. (See subsection 11.19 Significant Impacts That Cannot be Avoided or Mitigated, and Evaluation of Overriding Considerations Under CEQA in **Section 11, Override Findings and Recommendations**)

Staff's inquiry is the effect of the project on aerial firefighting as an independent component of an emergency response plan.

The 2023 PyroAnalysis report acknowledges the turbines present an impact to aerial firefighting stating,

> *Chief Bret Gouvea authoritatively addressed this concern, stating: "Aerial hazards do pose a safety concern for aerial firefighters; however, they are something we must work around on a daily basis" (Gouvea, 2021). Standing at up to 610 feet in height and equipped with FAA-required flashing red lights, the turbines are immediately visible to pilots who are equipped with aerial hazard maps that they carefully consult before initiating aerial firefighting operations.*

In the April 2024 report, PyroAnalysis restates the above statement (Stantec 2024u – TN 255883, p. 8).

As detailed below, the issue is not whether the pilots can see the turbines, but whether given the layout and size of the turbines, pilots can fly low enough and in the right location to attack a fire burning through the over 2000-acre mountainous project site. The CEQA question being addressed is the project's impact on an emergency response plan. In this case, the response to a wildfire by deploying aerial assets. PyroAnalysis' report also cites to an Australian firefighting pilot who stated in an article titled, *Between the Towers, Fighting Brush Fires on Windfarms*, that "he sees the sheer size of the towers as a benefit, as it makes them highly visible." Beyond the relevance of comparing a bush fire in Australia to a forest fire in the mountains, the statement on visibility does not support a conclusion that visibility equates with being able to effectively deploy aerial assets throughout the project site (PyroAnalysis report, Stantec 2023c TN 253505, p. 20).

Staff reviewed a detailed letter submitted by the Associated Aerial Firefighters and former Deputy Chief of CAL FIRE air operations that noted concerns that the project would pose "serious impediments to aerial firefighting in Eastern Shasta County" (Public 2023a TN249668). The authors of the letter have significant experience with aerial firefighting including a retired CAL FIRE Deputy Chief of air tanker operations with 34 years of experience and a Current DC-10 retardant dropping pilot (Public 2023a TN249668). The letter states that the project would "effectively create a no fly" zone

that would greatly increase the risk that any wildfire that either began in the project site or spread into the project site from any surrounding area, could not be quickly contained, and would likely grow beyond the project area to out-of-control proportions." The letter notes that the most effective way to quickly contain wildfires in California is with the use of fixed wing aircraft that drop fire retardant and that CAL FIRE, and all other agencies, depend heavily on aerial firefighting to contain fires, create fire lines, and otherwise protect lives, homes, businesses, and in many cases entire communities (TN249668). The letter also raised the concern that in the event of a project triggered or other area wildfire, Highway 299 could become inaccessible. This could prevent ground based firefighters from accessing the project area and with the limits to aerial firefighting due to the project, could allow a fire to spread to neighboring communities. Staff concurs that the issues raised by these experienced aerial firefighters related to the wind turbines and aerial firefighting are valid concerns.

Aerial firefighting plays a vital role in wildfire management and control, and with accelerating incidence and severity of wildfires, the importance of increasingly effective and innovative aerial firefighting strategies cannot be overstated (Haigh 2024). According to the U.S. Forest Service (USFS), aerial application of fire retardant is part of an integrated firefighting strategy and is applied in a wide range of situations. The USFS staff note that high-intensity fire, wildfires with rapid spread rates and other factors, make it difficult for ground-based firefighters to access and fight wildland fires safely. Aerially applied fire retardant slows the spread rate of wildfire by cooling and coating fuels, depleting the fire of oxygen, and slowing the rate of fuel combustion as the retardant's inorganic salts change how fuels burn. This can decrease fire intensity and give firefighters time to construct fire lines that are more likely to hold. It also increases firefighter safety and minimizes fire impacts to the environment (Haigh 2024).

In the event of a large wildfire within the project site, Chief Sean O'Hara has indicated that the turbines would impair aerial firefighting at the site (CEC 2024i TN 254899, CEC 2024h TN 254875). Chief O'Hara noted that several factors such as turbine spacing, fire conditions, and smoke would determine to what extent aerial assets could be used to help fight a wildfire onsite. Additionally, Chief O'Hara pointed out that the project's turbine layout and smoke conditions from the wildfire would be a large impediment to using aerial assets near wind turbines. Chief O'Hara indicated that based on the project layout there are only a few areas within the project's boundary that fixed wing aerial resources could be used, primarily in the northern part of the project site and along the project perimeter (CEC 2024i TN 254899). The use of fixed wing aerial assets to drop fire retardant over most of the project site would be ineffective, because those aerial assets must drop fire retardant as close to the ground as possible for it to be effective so that it does not dissipate before hitting the ground. Additionally, the aircraft would likely not be able to fly low enough for the fire retardant to be effective due to the wind turbine layout, transmission line layout, and fire conditions (CEC 2024i TN 254899). The most effective drop height is 150 feet above the ground and lower, and when crossing ridge tops not over 700 feet (TN 246668). However, helicopters could be used to drop water between the turbines. Helicopters could secure water from local sources including

rivers, reservoirs, and local dip tanks (CEC 2024i TN 254899, Stantec 2023c TN253505). Helicopters can also drop retardant but at a capacity much less than from an air tanker (TN246668), and they would need to be refilled with retardant at a base or operations center, if appropriate.

The 2024 PyroAnalysis report acknowledges that the topography and turbines represent aerial hazards and states (Stantec 2024u – TN 255883, p. 8),

> *it is normal for firefighting aircraft to experience a variety of topographical challenges and aerial hazards when suppressing wildfires. This is why CAL FIRE maintains a diverse fleet of aircraft, such as helicopters, large air tankers, and small fixed-wing planes. Aircraft diversity is an essential component of effective firefighting operations. Different types of aircraft each have unique capabilities that can be tailored to specific tasks within a firefighting mission. For example, helicopters can maneuver in tight spaces and deliver precise water or retardant drops in areas not accessible with fixed-wing aircraft.*

Staff agrees with the above statement. However, as noted above the CEQA question being addressed is the project's impact on an emergency response plan. Per discussions with Chief O'Hara and Chief Sjolund (CEC 2024h TN 254875 and CEC 2024i TN 254899), summarized above, the presence of the turbines would present an impediment to the operation of fixed wing aircraft at the project site during a wildfire. Though helicopters could potentially be used to fight a wildfire on the project, they would be subject to the same hazardous air conditions from a wildfire and would only be able to drop smaller loads of fire retardant, need to be refilled more often, and from nearby operations bases. If the helicopters did not have access to retardant immediately, they could utilize the water sources located on and near to the project site. However, Chief O'Hara indicated that retardant drops are preferred to water drops as the water dissipates and evaporates more easily when dropped (CEC 2024i TN 254899).

In the event of a wildfire at the project site, the project would have the capability to remotely shut down the turbines via a Remote-Operations Control Center that would be staffed 24 hours a day, 365 days per year. However, before the ATG supervisor would deploy aerial assets, positive confirmation that the turbines have been shut off would have to be provided by the project owner (CEC 2024i TN 254899). Therefore, staff proposes COC **HAZ-6** to ensure that the turbines are fully shut down and positive confirmation of the shutdown is provided to CAL FIRE in the event of a wildfire for the safety of aerial assets operating in the area. Even with this condition in place there is a chance for a delay to occur at some point in the communication process as wind operators become aware of a wildfire, take action to shut down the turbines, and communicate the required confirmation to CAL FIRE.

Combating wildfire is a combination of prevention, proper planning and utilizing available firefighting assets both aerial and ground effectively. Due to the size and configuration of the project's structures, the project reduces the effective usage of

firefighting aerial assets. Chief O'Hara made clear that only portions of the site would be accessible by aerial assets during a wildfire event (CEC 2024i TN 254899). And the ultimate call as to whether aerial assets could be used would be determined by the ATG supervisor who would determine the safety and ability to use aerial assets in the area (CEC 2024i TN 254899). Though CAL FIRE ground firefighting assets could be deployed to the area in the event of a wildfire, their effectiveness would be hampered without the appropriate aerial coverage, especially given the mountainous terrain and other characteristics of the project area previously discussed. The decreased effectiveness could prolong firefighting activities or potentially allow a wildfire to spread across the large site.

Section 15064 of the CEQA Guidelines notes that the determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the agency, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. In the case of impacts related to wildfire, the analysis contains quantitative and qualitative elements as discussed in the preceding paragraphs, but there is not a clear quantitative metric to serve as a threshold of significance. This is specifically the case for aerial firefighting.

In considering the whole of the record and the consequences of a wildfire on Shasta County's community and tribal members, and as noted in Section 5.2 Biological Resources, impacts of uncontrolled wildfire on habitat and biological resources in Lassen National Forest and Shasta-Trinity National Forest, staff finds it prudent to consider the described impacts to aerial firefighting, to be significant. This is especially so given the expectation that climate change will continue to enhance the intensity of wildfires and the potential for accelerated fire spread. While it is not possible to quantify the impacts the turbines will have on aerial firefighting to some numerical value, the unanimous conclusions from all the firefighting experts submitting information into the docket that the turbines pose some level of impediment to aerial firefighting coupled with the devastation a large wildfire can bring, supports staff's reasonable approach.

Since the local firefighting agencies could potentially not provide the full suite of firefighting assets in the event of a wildfire at the project site due to the reasons discussed above, staff has determined that the project would create a potentially significant and unmitigable impact.

ii. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants and the public in nearby communities to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Wildfire risk at the project site is influenced by the rugged topography, increasingly hot dry climate during fire season, and wind patterns, however as most wildfires in California are human caused the fire risk would be increased by FWP construction and operation.

Construction

Less Than Significant with Mitigation Incorporated. The project is located in a CAL FIRE very high FHSZ and a CPUC Tier 2 HFTD. Project construction activities, including heat or sparks generated by construction vehicles and equipment and blasting, could ignite a wildfire on the project site. Construction would result in increased vehicle activity on local and onsite access roads, resulting in an increased potential for ignition of wildfires. The presence of numerous construction workers on the site also increases the potential for ignition of wildfires.

Wildfires release large amounts of air pollutants, which can lead to harmful exposure for first responders, nearby communities, and populations that are located farther away. Wildfire smoke is a mixture of gases and fine particles from burning trees and other plant material. The gases and fine particles could be dangerous if inhaled. In wildfires, carbon monoxide is mainly a risk to people (like firefighters) who work near smoldering areas. Smoke can irritate people's eyes and respiratory systems and worsen symptoms of people who have pre-existing health conditions and those who are particularly sensitive to air pollution.

Due to the increase in potential sources of ignition from project construction activities discussed above, staff proposes COC **HAZ-7** to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS, thus reducing the potential to expose workers and the public in nearby communities to wildfire pollutants from project construction triggered wildfire. Additionally, staff concludes that the implementation of COC **WORKER SAFETY-1** which include construction worker safety programs which would help to reduce the risk of wildfire ignition.

Operation

Less Than Significant with Mitigation Incorporated. As discussed above, the project site is located in an area of very high fire hazards. Project operation and maintenance activities, including heat or sparks generated by operations vehicles, equipment used for repairs and maintenance, could ignite a wildfire on the project site. While there is a concern with project construction activities contributing to a higher probability of wildfire ignition, project operations are a larger concern. The project operations and maintenance would be taking place in an area that currently has limited human activities which means that there is a higher probability for wildfire ignition during the operation of the project.

Mechanical failures of project facilities and equipment could happen to the 48 wind turbines, underground and aboveground collector systems, and substation and switching station. The types of failures that could occur include turbine overload, the overheating of moving parts, a collector line failure, or a structure fire involving the substation. These examples of equipment failure could potentially cause an accidental ignition. Sparks created by any of these mechanical failures could ignite surrounding flammable material. Additionally, due to the height of the turbines, lightning strikes could also result in the ignition of a fire on the wind turbine or within the turbine

nacelle. For more information on the wind turbines fire detection and suppression systems, see **Section 4.4, Worker Safety and Fire Protection**.

Due to the increase in potential sources of ignition from project operation and maintenance activities discussed above, staff proposes COC **HAZ-7** to reduce the risk of wildfire ignition and ensure compliance with wildfire prevention LORS. Prevention of project triggered wildfires would reduce the potential for pollutants from project related wildfire to adversely impact workers of the public in nearby communities. Additionally, staff concludes that the implementation of COC **WORKER SAFETY-2** which includes operation and maintenance worker safety programs which would help to reduce the risk of wildfire ignition.

iii. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Construction and Operation

Less Than Significant with Mitigation Incorporated. The project would include the installation of approximately 39 miles of underground and 6 miles of aboveground collector systems. Additionally, the project would include 19 miles of new access roads and the widening of 19 miles of existing access roads. Water tanks and a well for potable supply and fire suppression activities would also be constructed for the project (FWPA TN 254794).

As, discussed above in h (ii), the project site is located in an area of very high fire hazard and mechanical failures related to the collector lines, turbines, or other project components could ignite a fire. The construction and operation of the project with the installation of new access roads increases the potential for ignition of a fire due to increased human access and equipment into areas with very high fire hazards.

The project has indicated that fuel breaks would be constructed along access roads, the aboveground and underground collector lines, and around the turbines and other project components (Stantec 2024j TN 254350). Both non-shaded and shaded fuel breaks would be constructed as part of the project. Non-shaded fuel breaks would correspond to the permanent disturbance footprint for access roads, collector lines, turbine pads, and all other project components with permanent footprints and the associated cleared areas (Stantec 2024, TN 254350). The access roads would be designed to have up to a 40-foot-wide cleared permanent disturbance area with a 20-foot-wide drivable surface plus a 10-foot buffer on either side for road shoulders and appropriate drainage features. The overhead collector lines would have an approximately 80-foot-wide corridor that would be kept clear of taller woody vegetation. Where the underground cable cannot be co-located within access roads, a permanent, 30-foot-wide corridor centered on each buried cable would be maintained clear of woody vegetation (FWPA TN 254794). Fuel breaks around other project

components would include a 2.5-acre area (186-foot radius) around each turbine and approximately 0.75-acre area (102-foot radius) around each MET tower (FWPA TN 254794).

Approximately 667 acres of shaded fuel breaks would be constructed along the main access roads and secondary interior access roads (Stantec 2024j TN 254350). Shaded fuel breaks would be constructed along the main access road out to 100 feet from the centerline on both sides of the roads and out to 50 feet from the centerline on both sides of the roads, except in areas where topography or other elements make it physically infeasible.

Chief O'Hara has stated that fuel breaks are an important part of firefighting and that larger and more fuel breaks would allow for more opportunities to contain and fight a fire. Chief O'Hara indicated that a fire break around the project site would be a valuable tool to help limit the ability and/or slow down the spread of a wildfire (CEC 2024i TN 254899, CEC 2024h – TN 254875). Therefore, staff proposes COC **HAZ-8** which would require the project owner to develop a Fuel Break Plan (FBR) to reduce flammable vegetation near key project facilities and equipment and around the perimeter of the project site that would reduce the potential of fuel ignition and wildfire spread.

Water for fire suppression during project construction and operation would be provided by water trucked in from an outside source and stored in onsite water tanks and water/dust control trucks. The project has indicated that a minimum of three 5000-gallon water tanks would be placed throughout the project site for fire suppression, in addition to the existing 10,000-gallon dip tank on the project site that is owned, operated, and maintained by the property owner (CEC 2024j TN 255058). Chief O'Hara indicated that this volume of onsite water would be insufficient to fight a larger wildfire and that each 5000-gallon tank would only be capable of refilling an average fire truck a few times (CEC 2024h – TN 254875). Additionally, Chief O'Hara indicated that gravity fed tanks would not be adequate for firefighting use. Due to a lack of a large onsite water supply, once the tanks are empty refilling would take time as water would have to be trucked to the site. Once the available water in the onsite water tanks was exhausted CAL FIRE would have to use water trucked in via water tender trucks with an average capacity of 3,500 gallons (CEC 2024h– TN 254875). CAL FIRE typically dispatches one water tender to a fire during high fire danger periods (CEC 2024 h - TN 254875), however Shasta County does maintain 17 water tenders as part of their fire response fleet (Stantec 2024u – TN 255883). The project owner stated in the application that they would confer with CAL FIRE to determine the appropriate number and location of additional water tanks for firefighting on the project site. Staff concludes that this is a good first step but is not sufficient given the lack of water tanks and possibility that the project owner does not agree to CAL FIRE's requirements. Therefore, staff proposes COC **HAZ-9** which would ensure that there is an adequate water supply onsite for firefighting needs.

iv. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Construction and Operation

Less Than Significant with Mitigation Incorporated. As discussed above under criterion (h) (i) and (ii), the project could increase wildfire risk as a result of increased sources of ignition and decreased aerial firefighting effectiveness. In the event of a wildfire, post-fire flooding, landslides or slope instability could occur due to burning of stabilizing vegetation and the resultant changes in soil characteristics and slope stability. Additionally, post-fire conditions can increase the potential for erosion and flooding due to the loss of vegetation that holds soils in place which results in increased erosion, and the loss of the water-absorbing properties of burned soils which causes increased runoff. As noted in **Section 5.6, Geology, Paleontology, and Minerals**, the project site includes relatively steep slopes and although no landslides are mapped on the site, debris and rock falls have been noted in the area and public scoping commented on multiple landslides in the area (Public 2023b, TN 253520). Post-fire landslides, slope failures, and flooding could result in hazards to onsite workers and structures, and risks to downstream and downslope communities such as Moose Camp, Montgomery Creek, and Round Mountain.

Post-fire soil conditions could result in impaired surface water quality due to runoff flowing across and through burned areas that are likely to have increased levels of sediment, organic debris, and chemicals (such as residuals from fire suppressants, and burned onsite materials such as plastics). The runoff could carry these contaminants to nearby water bodies, contributing to degradation of water quality and aquatic resources (Shasta County, 2016).

The project would be required to prepare and implement a construction Storm Water Pollution Prevention Plan (SWPPP) with associated best management practices (BMPs) related to stormwater flow and erosion control per COCs **WATER-1** and **WATER-2**. The SWPPP BMPs would reduce the potential for post-fire erosion and increased sedimentation of water bodies due to runoff during project construction. To reduce the potential for risks to project workers and downstream communities from post-fire landslides, slope failures, and flooding during project construction and operation, staff proposes COC **HAZ-10** to ensure that post-fire slope stability investigations are completed and associated slope and soil stabilization measures are conducted to reduce the potential for post-fire downstream flooding, landslides, or other forms of slope instability.

5.7.2.3 Cumulative Impacts

Less Than Significant Impact. The cumulative effect of hazards such as aviation, emergency evacuation and the transportation, use, and storage of hazardous materials impacts would be limited to the project site and immediately adjacent areas. No

cumulative projects were identified at or immediately adjacent to the project, therefore there are no projects with the potential to combine cumulatively with the project relative to Hazards and Hazardous Materials. Additionally, implementation of COCs **HAZ-1** through **HAZ-3, WATER-1** and **WATER-2**, and **WORKER SAFETY-1** and **WORKER SAFETY-2**, and compliance with LORS would reduce any impacts of the project relative to aviation, emergency evacuation, and hazardous materials to less than significant.

The project and cumulative projects 7, 9, 12 through 20, 22, and 24, identified from the review of the cumulative project list in **Appendix 1, Table 1-2,** are all located within high to very high FHSZs as well as Tier 2 or Tier 3 CPUC HFTDs. Each of the projects identified above could potentially involve wildfire ignition from construction activities such as vehicle or equipment use, or smoking that could contribute to a cumulative risk of ignition of wildfire in the Timber East area. Cumulative projects 13 and 19 include components that could also have the potential for wildfire ignition during project operation that could contribute to a cumulative risk of wildfire ignition in the Timber East area. However, each of the cumulative projects would be required to comply with fire prevention LORS and the proposed project would be required to comply with included COCs, including a FPP, a FBP, and a SWSP, that reduce the potential for ignition of wildfire to less than significant at each site and therefore they would not have a cumulatively considerable impact.

Ignition of multiple wildfires at the same time in the Timber East area could cumulatively combine to increase exposure of workers or the public in nearby communities to wildfire smoke, however as discussed above each cumulative project would comply with fire prevention LORS and the proposed project would comply with COCs, reducing the potential for wildfire ignition to less than significant.

The project would result in a less-than-significant impact regarding the interference with adopted emergency response or evacuation plans with implementation of **HAZ-5** and would not cumulatively combine with the listed cumulative projects.

The potential for a wildfire to result in landslides, slope failures, and flooding at site is dependent of the individual conditions at each site and would not combine cumulatively. Additionally, implementation of COC **HAZ-10** would reduce impacts related to post-fire slope instability and flooding to less than significant.

The proposed project has the potential to impair aerial firefighting and thus reducing firefighting effectiveness in the event of a wildfire at the project site. None of the cumulative projects, except cumulative project 19 – Hatchett Ridge would have the ability to impair aerial firefighting, The potential of the proposed project and Hatchett Ridge to impair aerial firefighting is specific to the area at and immediately adjacent to each project and would therefore be unlikely to be cumulatively considerable.

5.7.3 Project Conformance with Applicable LORS

Table 5.7-3 presents staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS, except Section 17.88.135 of the Shasta County Municipal Code. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.7-3 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
United States Code	
Resource Conservation and Recovery Act (RCRA), Title 42, Chapter 82, Sections 6921-6949a.	**Yes.** With the implementation of Conditions of Certification **HAZ-1** through **HAZ-3**, **WORKER SAFETY-2**, and compliance with DTSC LORs
Toxic Substances Control Act (TSCA), Title 15, Chapter 53, Subchapter I, Sections 2601 2629	**Yes.** With the implementation of Conditions of Certification **HAZ-1** through **HAZ-3** and **WORKER SAFETY-2**
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Title 42, Chapter 103, Sections 9601-9675.	**Yes.** With implementation of Condition of Certification **HAZ-1** through **HAZ-3**, **WORKER SAFETY-2**, and compliance with DTSC LORs.
Hazardous Materials Transportation Act (HMTA), Title 49, Subtitle III, Chapter 51, Sections 5101-5128	**Yes.** With the implementation of Conditions of Certification **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1**, **WORKER SAFETY-2**, and compliance with DOT LORs.
Code of Federal Regulations	
The SPCC Rule, Title 40, Chapter I, Subchapter D, Part 112 – Oil Pollution Prevention	**Yes.** With implementation of Condition of Certification **HAZ-1** and **HAZ-2**, and **WORKER SAFETY-2**.
FAA Part 77 - Safe, Efficient Use, and Preservation of the Navigable Airspace, Title 14, Chapter I, Subchapter E, Part 77, Sections 77.1-77.41	**Yes.** With implementation of Condition of Certification **HAZ-4**.
State	
California Health and Safety Code	
California Hazardous Waste Control Law	**Yes.** with compliance with DTSC hazardous waste LORS and with implementation of COCs **HAZ-1** through **HAZ-3**, **WORKER SAFETY-2**.
Aboveground Petroleum Storage Act Program, Chapter 6.67, Sections 25270-25270.13	**Yes.** With the implementation of Conditions of Certification **HAZ-1** through **HAZ-3** and compliance with the SPCC Rule.
Hazardous Materials Release Response Plans and Inventory Law, Division 20, Chapter 6.95	**Yes.** With the implementation of Conditions of Certification **HAZ-2** and **HAZ-3**, **WORKER SAFETY-2**, and compliance with DTSC LORs
California Code of Regulations	
Transportation of Hazardous Materials on California Highways, Title 13, Division 2, Chapter 6, Article 3, Sections 1160-1168	**Yes.** With the implementation of Conditions of Certification **HAZ-2** and **HAZ-3**, **WORKER SAFETY-2**, and compliance with DTSC LORs

TABLE 5.7-3 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Cal/OSHA Department of Industrial Safety, Title 8, Division 1, Chapter 4, Subchapter 7, Group 16, Sections 5139-5230	**Yes.** With the implementation of Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2**.
California Water Code	
Porter-Cologne Water Quality Act	**Yes.** With compliance with SWRCB LORS and NPDES requirements and implementation of COCs WATER-1 and WATER-2.
California Public Resources Code – Fire Protection	
California Public Resources Code (PRC) Division 4, Part 2, including Sections 4119, 4292, 4293,4427, 4428, 4431, 4442, and 4445 and the Z'berg-Nejedly Forest Practice Act of 1973 (Sections 4511-4630.2)	**Yes.** With the implementation of Conditions of Certification **HAZ-5** through **HAZ-9**, **WORKER SAFETY-1** and **WORKER SAFETY-2**.
CPUC General Orders	
General Order 95	**Yes**. With implementation of **HAZ-7**, **HAZ-8**, and **WORKER SAFTEY-1**
General Order 166	**Yes**. With implementation of **HAZ-7**, **HAZ-8**, and **WORKER SAFTEY-1**
Local	
Shasta County General Plan	
Section 5.6 - Hazardous Materials Objective HM-1: Protection of life and property from contact with hazardous materials through site design and land use regulations and storage and transportation standards. Objective HM-2: Protection of life and property in the event of the accidental release of hazardous materials through emergency preparedness planning. Policy HM-c: Shasta County shall adopt policies for hazardous materials use, transportation, storage and disposal as required by State laws. Policy HM-d: Shasta County shall adopt policies for the protection of life and property from contact with hazardous materials through site design and land use regulations.	**Yes**. With implementation of **HAZ-1** through **HAZ-3**, and **WORKER SAFETY-1** and **WORKER SAFETY-2**
Chapter 5.4 - Fire Safety and Sheriff Protection, Objective FS-1: Protect development from wildland and non-wildland fires by requiring new development projects to incorporate effective site and building design measures commensurate with level of potential risk presented by such a hazard and by discouraging and/or preventing development from locating in high-risk fire hazard areas. Policy FS-a: All new land use projects shall conform to the County Fire Safety Standards. Policy FS-b: Known fire hazard information should be reported as part of every General Plan	**Yes**. With implementation of **HAZ-5** through **HAZ-10**, and **WORKER SAFETY-1** and **WORKER SAFETY-2**

TABLE 5.7-3 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
amendment, zone change, use permit, variance, building site approval, and all other land development applications subject to the requirements of the California Environmental Quality Act (CEQA).	
Shasta County Environmental Health Division - CUPA	**Yes**. With implementation of **HAZ-1** through **HAZ-3**, **WORKER SAFETY-1,** and **WORKER SAFETY-2**
Shasta Community Wildfire Protection Plan	**Yes**. With implementation of **HAZ-9**, although this community plan only applies to a small part of the southern end of the project.

5.7.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of certification, the project would have a less than significant impact related to Hazards, Hazardous Materials, and Wildfire and would conform with applicable LORS, with the exception of wildfire impacts related to aerial firefighting, disused under impact h (i). Impacts related to impairment of aerial firefighting and effectiveness of firefighting within the project site are significant and unavoidable. Staff recommends adopting the conditions of certification as detailed in subsection "5.7.5 Proposed Conditions of Certification" below to reduce all other impacts related to Hazards, Hazardous Materials, and Wildfire to less than significant.

5.7.5 Proposed Conditions of Certification

The following proposed Conditions of Certifications include both measures to mitigate environmental impacts and to ensure conformance with applicable LORS.

HAZ-1 The project owner shall prepare a construction specific Spill Control and Countermeasure Plan (SPCC) and provide these plans to the Shasta County Environmental Health Division (SCEHD) for review and comment and to the Compliance Project Manager (CPM) for review and approval.

Verification: At least 60 days prior to the start of construction the project owner shall prepare and submit the construction SPCC plan to the SCEHD for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to SCEHD requesting review and comment.

At least 30 days prior to the start of construction, the project owner shall provide copies of any comment letters received from SCEHD along with any changes to the construction SPCC plan for CPM review and approval. After CPM review and approval, the project owner shall provide complete copies of the final construction SPCC to the SCEHD, sending copies of the correspondence to the CPM.

HAZ-2 The project owner shall prepare a Hazardous Materials Business Plan (HMBP) and a Spill Control and Countermeasure Plan (SPCC) and provide these plans to the Shasta County Environmental Health Division (SCEHD) for review and comment and to the Compliance Project Manager (CPM) for review and approval.

Verification: At least 60 days prior to the start of operation the project owner shall prepare and submit the HMBP and SPCC to the SCEHD for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to SCEHD requesting review and comment.

At least 30 days prior to the start of operation, the project owner shall provide copies of any comment letters received from SCEHD along with any changes to the HMBP and SPCC plans for CPM review and approval. After CPM review and approval, the project owner shall provide complete copies of the final HMBP and SPCC to the SCEHD, sending copies of the correspondence to the CPM.

HAZ-3 The project owner shall not use or store any hazardous materials on site unless approved in advance by the CPM.

Verification: At least 10 days before using or storing a new hazardous material onsite, the project owner shall seek approval from the CPM. Additionally, the project owner shall provide in the Annual Compliance Report, an updated HMBP with the list of hazardous materials and quantities on site.

HAZ-4 The project owner shall submit a revised Notice of Proposed Construction or Alteration to the Federal Aviation Administration (FAA) reflecting the project's wind turbine and Meteorological Evaluation Tower (MET) locations, heights, and elevations.

Verification: At least 90 days before start of construction, the project owner shall submit the Notice of Proposed Construction or Alteration to the FAA for review and approval. A copy of the approved Notice of Proposed Construction or Alteration shall be provided to the CPM for review and approval.

HAZ-5 The project owner shall ensure that the project roads and driveway be properly designed and marked as listed below:

- The facility shall be identified with a street address marker located on the proposed building and adjacent to facility access road at State Highway 299 E. The address numbers shall be a minimum of four inches in height, reflectorized, and shall contrast in color with the background. The address shall be clearly visible at all times.
- Roadways and turnarounds shall be constructed in accordance with Section 6.12 of the Shasta County Fire Safety Standards prior to the construction of any portion of the proposed facility.

Verification: At least 60 days prior to the start of operation, the project owner shall submit a Roadway and Turnaround Plan and address marker design to CAL FIRE/SCFD for approval and comment. The project owner shall provide the CPM with a copy of transmittal letter to CAL FIRE/SCFD requesting review and comment.

At least 30 days prior to the start of operation, the project owner shall provide copies of any comment letters received from CAL FIRE/SCFD along with any changes to the Roadway and Turnaround Plan for CPM review and approval. After CPM review and approval, the project owner shall provide a complete copy of the Roadway and Turnaround Plan to CAL FIRE/SCFD, sending copies of the correspondence to the CPM.

HAZ-6 The project owner shall develop a Wildfire Turbine Shutdown Plan that details how the turbines shall be shut off and locked down during a wildfire occurring on or off the project site. The Wildfire Turbine Shutdown Plan shall include telephone numbers of the control center with the ability to shutdown the turbines when and telephone numbers of CAL FIRE/SCFD personnel that need to be notified of shutdown and positive confirmations of shutdowns. Additionally, the plan shall detail how the project owner provides positive confirmation of the wind turbine shut down to CAL FIRE/SCFD.

Verification: At least 60 days prior to the start of operation, the project owner shall prepare and submit the Wildfire Turbine Shutdown Plan to CAL FIRE/SCFD for review and comment and to the CPM for review and approval. The project owner shall provide the CPM with a copy of the transmittal letter to CAL FIRE/SCFD requesting review and comment.

At least 30 days prior to the start of operation, the project owner shall provide copies of any comment letters received from CAL FIRE/SCFD along with any changes to the Wildfire Turbine Shutdown Plan for CPM review and approval. After CPM review and approval, the project owner shall provide a complete copy of the Wildfire Turbine Shutdown Plan CAL FIRE/SCFD, sending copies of the correspondence to the CPM.

HAZ-7 The project owner shall prepare a project specific Fire Prevention Plan (FPP) that shall be implemented during construction, operation and maintenance, and decommissioning of the project. The FPP shall detail the fire prevention actions, procedures, and activities to prevent an ignition of fires or exacerbation of wildfire risk during project construction, operation and maintenance, and decommissioning. The FPP shall be prepared in consultation with Shasta County Fire Department/CAL FIRE and shall be consistent with directives in the Shasta County Fire Safety Standards, the Forest Practice Rules, and CAL FIRE's Shasta-Trinity Unit Strategic Fire Plan, and in compliance with all other applicable federal, state, and local fire prevention regulations. Even if extinguished, all fires

shall be reported immediately to CAL FIRE/SCFD. The FPP shall include at a minimum, but not be limited to, the following:

- Prior to construction, the project owner shall designate primary and alternate Fire Coordinators such that a Fire Coordinator is present at all times during project construction, operations and maintenance, and decommissioning. The Fire Coordinator shall be responsible for ensuring that construction, operations and maintenance, and decommissioning crews (including contractors) have sufficient fire suppression equipment, communication equipment, shall lead and coordinate fire patrols, ensure that the required clearances are followed onsite, and ensure that all crew members have received training on the FPP and its components.
- The project owner shall ensure all construction workers and operations and maintenance personnel receive training on the implementation of the FPP including how to conduct a fire patrol, proper use of firefighting equipment, and procedures to be followed in the event of a fire, vegetation clearance and equipment usage requirements, turbine, and electrical equipment inspections.
- Prior to each fire season and upon hire of new employees or subcontractors, an orientation concerning recent fire history that has adversely affected residents of Shasta County, including and specifically the 1992 Fountain Fire, fire hazards, fire safety, emergency notification procedures, use of fire safety equipment, fire safety rules and regulations, and the conditions of approval shall be provided by the employer.
- The FPP shall include a description of the operating area along with a map showing major access routes, significant hazards, firefighting water supply locations, and a 24-hour emergency contact phone number. It shall also include a list of state and local fire laws applicable to the facility operations, and any conditions of approval pertaining to fire safety along with the facility operating procedures which indicate your compliance with these laws and/or conditions of approval.
- The project owner shall conduct an analysis of fire causes going back a minimum of five years, or to the first day of construction, whichever is less. List any trends indicated by the fire causes along with a plan of correction/proposed solutions for preventing these fire causes and provide an implementation and completion date for all plans and correction to be submitted to CAL FIRE/SCFD.
- Due to the large size of the proposed project, vegetation cleared for construction and/or land development purposes shall be disposed of on a regular basis. Accumulation of vegetation debris shall be minimized. All cleared vegetation shall be properly disposed of in accordance with Air Quality Management Regulations and State or local Fire Department Burning Permit Regulations. All cleared vegetation shall be properly disposed of prior

to a final inspection by the Shasta County Building Division and CAL FIRE/SCFD.

- All initial project clearing shall, to the extent feasible, be done between November 1st and May 1st.
- The FPP shall include an inspection and maintenance schedule to ensure all construction and operations equipment is in good working order, and specifications for the inspection and maintenance activities to be conducted.
- The project owner shall require that accumulations of wastepaper, weeds, combustible waste material, waste petroleum products, tires, or rubbish of any type are prohibited.
- The project owner shall require that rags, cloth, or paper towels saturated with oil, solvent, or petroleum products shall be kept in a metal can with a tight-fitting cover.
- Storage, use, and dispensing of flammable/combustible liquids shall be in accordance with the adopted edition of the California Fire Code. Plans shall be submitted to CAL FIRE / SCFD for review and approval prior to construction, storage, or use.
- All mobile and stationary equipment with non-turbocharged internal combustion engines shall be equipped with a properly functioning, approved spark arrestor.
- The project owner shall require vehicle drivers to conduct a visual inspection of the vehicle for potential sparking risks prior to operation of the vehicle. This inspection should include, but not be limited to a check of tire pressure and an inspection for chains or other vehicle components that could drag while driving.
- The project owner shall enforce a requirement that construction personnel park any vehicles within roads, road shoulders, graveled areas, and/or cleared areas (i.e., away from dry vegetation) wherever such surfaces are present at the construction site.
- Operations vehicles and equipment shall be visually inspected for potential sparking risks prior to operation of the vehicle.
- Portable fire extinguisher(s) for the proposed buildings shall be provided in accordance with the adopted edition of the California Fire Code. The project owner shall require that light trucks and cars with factory-installed mufflers be used only on roads where the roadway is cleared of vegetation.
- The project owner shall require that equipment parking areas and small stationary engine sites are cleared of all extraneous flammable material.
- The project owner shall include a monitoring and inspection protocol for turbines and electrical infrastructure.

- The project owner shall include protocols for disabling re-closers and deenergizing portions of the electrical collection and transmission systems.
- The project owner shall prohibit smoking in wildland areas, with smoking limited to paved areas or areas cleared of all vegetation.
- The project owner shall ensure all vehicles, including subcontractors, shall be equipped with a fire extinguisher, at least one round point shovel of at least 46 inches in length, a 5-gallon backpack water pump, and a means for reporting emergencies. All vehicles must have at least a 5-pound fire extinguisher in working order with valid and dated inspection ticket. All heavy equipment will be required to carry no less than the equivalent of a 10-pound fire extinguisher in working order with valid and dated inspection ticket.
- Fire protection water for proposed buildings shall be in compliance with Section 6.43 of the Shasta County Fire Safety Standards
- The project owner shall maintain a minimum 200-gallon water truck on site. All water trucks and water trailers shall be capable of pumping water through a fire hose at sufficient volume and pressure (20 gallons per minute at 115 psi) to effectively attack a fire start. Devices capable of communicating with fire agency dispatch services from the operating site shall be required to be onsite during construction and operations of the project.
- The project owner shall have water tanks, water trucks, or portable water backpacks (where space or access for a water truck or water tank is limited) sited/available in the project area for fire protection. The project owner shall provide radio and/or cellular telephone access that is operational within the project site to all construction crews, subcontractors, and inspectors to allow communications with other vehicles and construction crews. All fires shall be reported immediately upon detection.
- The project owner shall require that all construction vehicles, including vehicles transporting supplies and materials, and any O&M related vehicles, are regularly inspected to minimize vehicle fire hazards.
- The project owner shall include provisions for fire prevention and fire control/suppression when using tracked equipment such as dozers, excavators, cranes, etc., that will be working near vegetation that may be ignited by sparks associated. with metal tracks and natural surfaces (i.e., rock).
- As construction may occur simultaneously at several locations, each construction site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires.
- All welding and storage of cylinders shall be in accordance with the adopted edition of the California Fire Code. In addition to welding, other high-risk activities such as cutting and grinding shall require welding curtains and shall

be restricted based on fire weather indices as determined by the CAL FIRE/SCFD.

- Prior to activities that increase risk of ignition (hazardous operations) (e.g., mowing, blasting, grinding, welding, cutting etc. from which a spark, flame, or fire may originate), the work area and a buffer of at least 15 feet will be cleared of potential flashy fuels (e.g., dry grass, pine needles, etc.). An additional 15 feet shall be cleared or wet down. If wetting down is chosen, the area shall be maintained wet throughout the operation and the water used for wetting shall not diminish the backpack pumps capacity. Two serviceable round point shovels at least 46 inches in length and a minimum of two 5-gallon water backpack fire pumps shall be maintained within 25 feet of the operation. A fire watch shall be maintained within 25 feet of the hazardous operation. The fire watch shall have a radio or equivalent shall be available at the operation site in which to report emergencies.
- Hazardous operations (as defined above) shall not be permitted when:
    - Anytime flammable ground vegetation exists and if any one of the following conditions exist: the air temperature is 90 degrees Fahrenheit or greater; the wind speed is 8 miles per hour (mph) or greater; or the relative humidity is 20% or less. Weather readings shall be taken on site on a regular basis. Logs of the regular weather readings shall be kept and provided to the Fire Marshal or its designee(s) upon request. Exceptions: when the wind speed is 15 mph or less and the relative humidity is 60% or greater, or when the wind speed is 15 mph or greater and the relative humidity is 80% or greater.
    - Anytime during the declared fire season when the wind speed is 25 mph or greater.
    - Anytime during the declared fire season when the relative humidity is 10% or less.
    - Anytime the National Weather Service, Sacramento Office declares Red Flag Warning.
- During construction of the project, the project owner shall implement ongoing fire patrols during construction hours and for 2 hours after the end of daily construction and after any hot work has been conducted.
- In the event of a Red Flag warning issued by the National Weather Service, all non-emergency work during project construction, operation, and maintenance shall cease on the Project site until the Red Flag Warning has expired/cleared.
- If emergency work needs to be undertaken during Red Flag Warning conditions, the FPP shall advise that extreme caution must be taken and list the preventative measures that shall be implemented such as application of

ground-based fire retardants/gels/foams on nearby (within 30 feet, or more depending on the type of 'emergency work') vegetation or other flammables.

- The project owner shall use industry-approved fire behavior and fire spread modeling, such as 'FlamMap' or similar, to develop thresholds and triggers for certain activities, including curtailment of construction-related activities that increase risk of ignition (e.g., blasting, grinding, welding, cutting, excavating, driving, etc.) The model should evaluate fire behavior using ignition locations in all places in which activities may occur and shall test a full range of plausible weather conditions, including extreme events, in addition to fuel models that are representative of the site and its surroundings. The model shall provide parameters based on temperature, wind speed, topography, fuel types, fuel moisture and relative humidity to establish work stoppage guidance and establish parameters to designate Critical Fire Weather (CFW) for the project site and surrounding area. The developed parameters for work curtailment and designation of CFW days shall be included in the FPP.
- On high-fire-hazard days without a Red Flag Warning, the following measures would be taken to reduce fire ignition hazards:
    - On high-fire-hazard days without a Red Flag Warning during Fire Season (May 1 to October 31), the project owner shall measure humidity every 2 hours with a handheld device capable of measuring relative humidity. The project owner shall keep a daily log of humidity readings and all construction related activities would cease construction-related activities when relative humidity drops below 20%.
    - The project owner shall specify when use of public roadways by construction related vehicles, including those traversed by the public near the project site, shall be limited or ceased due to critical fire weather (CFW) periods and when Red Flag Warnings (RFW) have been issued, with an objective of ensuring there shall not be a significant impact to any emergency response plans or emergency evacuation plans.

Verification: At least 90 days prior to the start of construction, the project owner shall prepare and submit the FPP to SCFD/CAL FIRE for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to SCFD/CAL FIRE requesting review and comment.

At least 45 days prior to the start of construction, the project owner shall provide copies of any comment letters received from SCFD/CAL FIRE along with any changes to the FPP for CPM review and approval. After CPM review and approval, the project owner shall provide complete copies of the final FPP to the SCFD/CAL FIRE, sending copies of the correspondence to the CPM.

HAZ-8 The project owner shall create a Fuel Breaks Plan (FBP) with input from a wildland fire fuels specialist or Area Forester with wildfire prevention experience,

and incompliance with CPUC GO 95, Shasta County Fire Safety Standards, Shasta Community Wildfire Protection Plan that includes the following items:

- Creating and maintaining a minimum 80-foot-wide corridor clear of tall woody vegetation and flammable understory vegetation along the overhead power lines and collector lines.
- Creating and maintaining a minimum 30-foot-wide corridor clear of woody vegetation and flammable understory vegetation along the underground collector line corridors.
- Creating and maintaining a minimum 200-foot buffer clear of vegetation around the wind turbines.
- Creating and maintaining minimum clearances (defensible space) around structures/budlings per PRC and CCR "Fire Safe Regulations" and Shast County Fire Safety Standards.
- Creating and maintaining shaded fuel breaks adjacent to project access roads and around the project site boundary, as physically feasible. The shaded fuel break width may vary with topographic and vegetation conditions; however, the shaded fuel break shall be designed to, at a minimum, meet the shaded fuel break dimension and construction specifications in the NRCS Conservation Practice Specification for Fuel Break – Forest Land Code 383 or approved equivalent specification.
- Creating an inspection and maintenance plan that lists various items that are to be inspected, the maintenance schedule, and specification for the maintenance activities to be conducted. The plan shall detail that fuel breaks shall be inspected annually. Fully cleared/non-shaded fuel breaks shall be maintained on an annual basis and shaded fuel breaks shall be maintained every 3 years.

Verification: At least 90 days before the start of construction, the project owner shall prepare and submit the FBP to the SCFD/CAL FIRE for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to SCFD/CAL FIRE requesting review and comment.

At least 45 days before the start of construction, the project owner shall provide copies of any comment letters received from SCFD/CAL FIRE along with any changes to the FBP for CPM review and approval. After CPM review and approval, the project owner shall provide complete copies of the final FBP to SCFD/CAL FIRE, sending copies of the correspondence to the CPM.

At least 90 days before the start of operation, the project owner shall supply FBR and any site drawings to the Delegate Chief Building Official for construction inspection and verification.

HAZ-9 The project owner shall consult with SCFD/CAL FIRE to create a Site Water Supply Plan (SWSP) that determines the volume of the tanks, number of water tanks and the appropriate locations to help SCFD/CAL FIRE to fight fires on the project site. The tanks selected shall be of a nonflammable material and not be gravity fed.

Verification: At least 90 days before the start of construction, the project owner shall prepare and submit the SWSP to the SCFD/CAL FIRE for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to SCFD/CAL FIRE requesting review and comment.

At least 45 days before the start of construction, the project owner shall provide copies of any comment letters received from SCFD/CAL FIRE along with any changes to the SWSP for CPM review and approval. After CPM review and approval, the project owner shall provide complete copies of the final SWSP to SCFD/CAL FIRE, sending copies of the correspondence to the CPM.

HAZ-10 The project owner shall hire a qualified geotechnical engineer to conduct a slope stability investigation on slopes impacted from wildfire within the project site. The slope stability investigation report shall provide recommended measure(s) to stabilize slopes to prevent significant soil erosion, landslides, other slope failures, and subsequent downstream flooding. The project owner shall hire the qualified geotechnical engineer or their representative to monitor and document application of recommended stabilization measures.

Verification: At the first opportunity after the site has been declared safe by SCFD/CAL FIRE, the project owner shall let the qualified geotechnical engineer on site to conduct the slope stability investigation and notify the CPM. The report shall be submitted to the CPM for review and approval no later than 30 days after start of the slope stability investigation. After the CPM has approved the report, the project owner shall implement the recommendations in the report, if any, under the guidance of a hired geotechnical engineer and provide status updates to the CPM on a monthly basis until the measures have been completed.

5.7.6 References

Abatzoglou & Williams 2016 - Abatzoglou, J. T., & Williams, A. P. Impact of anthropogenic climate change on wildfire across western US forests. Proceedings of the National Academy of Sciences of the United States of America, 113(42), 11770–11775. Available online at: https://doi.org/10.1073/pnas.1607171113

Agee et.al. 2000 - Agee, J. K., Bahro, B., Finney, M. A., Omi, P. N., Sapsis, D. B., Skinner, C. N., van Wagtendonk, J. W., & Weatherspoon, C. P. The use of fuelbreaks in landscape fire management. Forest Ecology and Management, 127, 55–66.

Bowman, David MJS, et al. 2017 - David M. J. S. Bowman, Grant J. Williamson, John T. Abatzoglou, Crystal A. Kolden, Mark A. Cochrane, and Alistair M. S. Smith. " Human exposure and sensitivity to globally extreme wildfire events." Nature ecology & evolution 1.3 (2017): 0058. Accessed online at: https://escholarship.org/content/qt61r3f0b5/qt61r3f0b5.pdf

CAL FIRE 2012 - California Department of Forestry and Fire Protection. 2012 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2013 - California Department of Forestry and Fire Protection (CAL FIRE). 2013 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2014 - California Department of Forestry and Fire Protection. 2014 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2015 - California Department of Forestry and Fire Protection. 2015 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2016 - California Department of Forestry and Fire Protection. 2016 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2017 - California Department of Forestry and Fire Protection (CAL FIRE). 2017 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2018 - California Department of Forestry and Fire Protection (CAL FIRE). 2018 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2019 - California Department of Forestry and Fire Protection. 2019 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2020 - California Department of Forestry and Fire Protection. 2020 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2021 - California Department of Forestry and Fire Protection. 2021 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2022a - California Department of Forestry and Fire Protection. 2022 Wildfire Activity Statistics. Accessed online at: https://www.fire.ca.gov/our-impact/statistics

CAL FIRE 2022b - California Department of Forestry and Fire Protection. 2022 California Forest Practice Rules. Accessed March 2024. Accessed online at: https://bof.fire.ca.gov/media/y5rfw50b/2022-fpr-and-fpa_ada.pdf

CAL FIRE 2024 - California Department of Forestry and Fire Protection (CAL FIRE). Fire Hazard Severity Zone viewer. Accessed January through March 2024. Accessed online at: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

CALFIRE 2024d - CAL FIRE (TN 259802). Letter from CAL FIRE Department of Forestry and Fire Protection, dated October 30, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CAL FIRE and Shasta County 2023 - California Department of Forestry and Fire Protection (CAL FIRE) and County of Shasta (Shasta County). 2023 Shasta-Trinity Umit Strategic Fire Plan. Accessed January and February 2024. Accessed online at: https://cdnverify.osfm.fire.ca.gov/media/nimdqw1b/2023-shasta-trinity-unit-fire-plan.pdf

California AG 2022 - California Attorney General (California AG). "Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act", by the State of California Office of the Attorney General (Attorney General Rob Bonta). Dated October 10, 2022. Accessed online at https://bof.fire.ca.gov/media/v1vc053c/fpc-2-b-2022-10-10-wildfire-guidance_ada.pdf

CEC 2024h – California Energy Commission (TN 254875). ROC - Questions on Information Pertinent to CalFire Contained in Applicant Wildfire Technical Report, dated March 6, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2024i – California Energy Commission (TN 254899). ROC - Impacts of Project Related to Wildfire, Firefighting, and Aerial Firefighting Capability, dated March 7, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2024j – California Energy Commission (TN 255058). ROC - Data Requests_Questions on Information Provided in Applicant's Wildfire Technical Report Submitted December 2023., dated March 13, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CPUC 2024 – California Public Utilities Commission. CPUC High Fire Threat District (HFTD) map viewer. Accessed February 2024. Accessed online at: https://www.arcgis.com/apps/webappviewer/index.html?id=5bdb921d747a46929d9f00dbdb6d0fa2

COS 2024k – County of Shasta (TN 259533). County of Shasta Comments on Shasta College Foundation CBA, dated October 14, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024l – County of Shasta (TN 260101). County of Shasta Comments on Wildfire, Economics, and Various Project Environmental Issues, dated November 15, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Das AJ 2022 - Das AJ, S. M. M. J. A. G. M. R. H. P. Empirically validated drought vulnerability mapping in the mixed conifer forests of the Sierra Nevada. Ecological Applications, 32(2), e2514.

DTSC 2024 - Department of Toxic Substances Control. EnviroStor website. Accessed February 2024. Accessed online at: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=Oak+run%2C+california

Franklin et. al. 2016 - Franklin, J., Serra-Diaz, J. M., Syphard, A. D., & Regan, H. M. Global change and terrestrial plant community dynamics. Proceedings of the National Academy of Sciences of the United States of America, 113(14). Accessed online at: https://doi.org/10.1073/pnas.1519911113

Fusco et. al. 2019 - Fusco, E. J., Finn, J. T., Balch, J. K., Nagy, R. C., & Bradley, B. A. Invasive grasses increase fire occurrence and frequency across US ecoregions. Proceedings of the National Academy of Sciences, 1–6. Accessed online at: https://doi.org/10.1073/pnas.1908253116

Fusco et. al. 2021 - Fusco, E. J., Balch, J. K., Mahood, A. L., Nagy, R. C., Syphard, A. D., & Bradley, B. A. The human–grass–fire cycle: how people and invasives co-occur to drive fire regimes. Frontiers in Ecology and the Environment, 1–10. Accessed online at: https://doi.org/10.1002/fee.2432

FWPA – Fountain Wind Project Application (TN 248288-13, TN 248288-14, TN 248288-16, TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248290-2). EDR Database Results, dated January 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248330-2). Project Refinement Memo September 2021, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248290-4). FAA Determination of No Hazard, dated January 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248330-4). Project Revisions Memo February 2021, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249091). Deficiency Letter Response, dated March 10, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250061). Haz_Environmental Database Report Search Results, dated May 8, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254794). fwp_project_description_2024_update_redline, dated March 4,2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Gannon et al 2023 - Gannon, Benjamin, Yu Wei, Erin Belval, Jesse Young, Matthew Thompson, Christopher O'Connor, David Calkin, and Christopher Dunn. "A quantitative analysis of fuel break effectiveness drivers in Southern California National Forests." Fire 6, no. 3 (2023): 104. Accessed online at: https://www.mdpi.com/2571-6255/6/3/104

Guiterman et. al. 2022 - Guiterman, C. H., Gregg, R. M., Marshall, L. A. E., Beckmann, J. J., van Mantgem, P. J., Falk, D. A., Keeley, J. E., Caprio, A. C., Coop, J. D., & Fornwalt, P. J. Vegetation type conversion in the US Southwest: frontline observations and management responses. Fire Ecology, 18(1), 1–16.

Ganteaume & Syphard 2018 - Ganteaume, A., & Syphard, A. D. Ignition sources. Encyclopedia of Wildfires and Wildland-Urban Interface (WUI) Fires, 1–17.

Haigh 2024. Lauren Haigh. Fighting Fires with Sustainable aerial strategies, Firefighting, 30 May 2024, by Lauren Haigh. Featured in AirMed & Rescue, Issue 149, June 2024. Accessed July 2024. Accessed online at: https://www.airmedandrescue.com/latest/long-read/fighting-fire-sustainable-aerial-strategies

Hantsen et. al. 2022 - Hantson, S., Andela, N., Goulden, M. L., & Randerson, J. T. Human-ignited fires result in more extreme fire behavior and ecosystem impacts. Nature Communications, 13(1), 1–8.

Hardy and Hardy 2007 – Hardy, Colin C., and Charles E. Hardy. "Fire danger rating in the United States of America: an evolution since 1916." International journal of wildland fire 16, no. 2: 217-231.

Higuera & Abatzoglou 2021 – Higuera, P. E., & Abatzoglou, J. T. Record-setting climate enabled the extraordinary 2020 fire season in the western United States. Global Change Biology, 27(1).

Keeley & Syphard 2017- Keeley, J. E., & Syphard, A. D. Different historical fire-climate patterns in California. International Journal of Wildland Fire, 26(4), 253–268. Accessed online at: https://doi.org/10.1071/WF16102

Keeley & Syphard 2018 - Keeley, J. E., & Syphard, A. D. Historical patterns of wildfire ignition sources in California ecosystems. International Journal of Wildland Fire, 27(12), 781–799.

Keeley & Syphard 2019 - Keeley, J. E., & Syphard, A. D. Twenty-first century California, USA, wildfires: fuel-dominated vs . wind- dominated fires. Fire Ecology, 15, 24. Accessed online at: https://link.springer.com/content/pdf/10.1186/s42408-019-0041-0.pdf

Keeley & Syphard 2016 - Keeley, J. & Syphard, A. Climate Change and Future Fire Regimes: Examples from California. Geosciences, 6(3), 37. Accessed online at: https://doi.org/10.3390/geosciences6030037

Kennedy et. al. 2019 - Kennedy, M. C., Johnson, M. C., Fallon, K., & Mayer, D. How big is enough? Vegetation structure impacts effective fuel treatment width and forest resiliency. Ecosphere, 10(2), e02573.

Kerns et. al. 2020 - Kerns, B. K., Tortorelli, C., Day, M. A., Nietupski, T., Barros, A. M. G., Kim, J. B., & Krawchuk, M. A. Invasive grasses: A new perfect storm for forested ecosystems? Forest Ecology and Management, 463, 117985.

Krawchuk & Moritz 2012 - Krawchuk, M., & Moritz, M. Fire and climate change in California: Changes in the distribution and frequency of fire in climates of the future and recent past (1911 – 2099). Accessed online at: http://www.energy.ca.gov/2012publications/CEC-500-2012-026/CEC-500-2012-026.pdf

Library of Congress 2024. Everyday Mysteries, Meteorology, Climatology, Can a tornado be made of fire?. Accessed July 2024. Accessed online at: https://www.loc.gov/everyday-mysteries/meteorology-climatology/item/can-a-tornado-be-made-out-of-fire/

Littell et. al. 2009 - Littell, J. S., McKenzie, D., Peterson, D. L., & Westerling, A. L. Climate and wildfire area burned in western U.S. ecoprovinces, 1916–2003. Ecological Applications, 19(4), 1003–1021. Accessed online at: https://doi.org/10.1890/07-1183.1

Low et. al. 2023 - Low, K. E., Battles, J. J., Tompkins, R. E., Dillingham, C. P., Stephens, S. L., & Collins, B. M. Shaded fuel breaks create wildfire-resilient forest stands: lessons from a long-term study in the Sierra Nevada. Fire Ecology, 19(1), 29.

Maranghides et. al. 2021 - Maranghides, Alexander, Eric D. Link, Christopher U. Brown, William Mell, Steven Hawks, Mike Wilson, Will Brewer, Robert Vihnanek, and William D. Walton. "A Case Study of the Camp Fire - Fire Progression Timeline."

Mass and Ovens 2021 - Mass, C.F. and Ovens, D. Fueling the Flames: The 2018 Camp Fire of Northern California. Bulletin of the American Meteorological Society, 102(10), pp.959-965.

Merriam et. al. 2006 - Merriam, K. E., Keeley, J. E., & Beyers, J. L. Fuel breaks affect nonnative species abundance in Californian plant communities. Ecological Applications, 16(2), 515–527. <Go to ISI>://000237052200008

Merriam et. al. 2007 - Merriam, K. E., Keeley, J. E., & Beyers, J. L. The role of fuel breaks in the invasion of nonnative plants. USGS Scientific Investigations Report.

Mietkiewicz et. al. 2020 - Mietkiewicz, N., Balch, J. K., Schoennagel, T., Leyk, S., St. Denis, L. A., & Bradley, B. A. In the line of fire: consequences of human-ignited wildfires to homes in the US (1992–2015). Fire, 3(3), 50.

Naficy et. al. 2010 - Naficy, C., Sala, A., Keeling, E. G., Graham, J., & DeLuca, T. H. Interactive effects of historical logging and fire exclusion on ponderosa pine forest structure in the northern Rockies. Ecological Applications, 20(7), 1851–1864.

Nagy et. al. 2018 - Nagy, R. C., Fusco, E., Bradley, B., Abatzoglou, J. T., & Balch, J. Human-Related Ignitions Increase the Number of Large Wildfires across U.S. Ecoregions. Fire, 1(1), 4. Accessed online at: https://doi.org/10.3390/fire1010004

Narayanaraj & Wimberly 2011 - Narayanaraj, G., & Wimberly, M. C. Influences of forest roads on the spatial pattern of wildfire boundaries. In International Journal of Wildland Fire (Vol. 20, Issue 6, pp. 792–803). http://dx.doi.org/10.1071/WF10032

Narayanaraj & Wimberly 2012 - Narayanaraj, G., & Wimberly, M. C. Influences of forest roads on the spatial patterns of human- and lightning-caused wildfire ignitions. Applied Geography, 32(2), 878–888. Accessed online at: https://doi.org/10.1016/j.apgeog.2011.09.004

NPS 2024 - National Parks Service. Wildfire Behavior website. Accessed March 2024. Online at: https://www.nps.gov/articles/wildland-fire-behavior.htm

Oliveira et. al. 2016 - Oliveira, T. M., Barros, A. M. G., Ager, A. A., & Fernandes, P. M. Assessing the effect of a fuel break network to reduce burnt area and wildfire risk transmission. International Journal of Wildland Fire, 25(6), 619–632.

Pausas et. Al. 2021 - Pausas, Juli G., and Jon E. Keeley. "Wildfires and global change." Frontiers in Ecology and the Environment 19, no. 7 (2021): 387-395. Accessed online at: https://www.uv.es/jgpausas/papers/Pausas-Keeley-2021-FEE_fire-global-change.pdf

Price et. al. 2012 - Price, O. F., Bradstock, R. A., Keeley, J. E., & Syphard, A. D. The impact of antecedent fire area on burned area in southern California coastal ecosystems. Journal of Environmental Management, 113, 301–307.

Public 2023a – Public Comments (TN 249668). Comments re: Air Attack Issues, dated April 14, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Public 2023b – Public Comments (TN 253520). Comments re: Opposition to Fountain Wind Project, dated December 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Rhodes & Baker 2008 - Rhodes, J. J., & Baker, W. L. Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests. The Open Forest Science Journal, 1, 1–7.

Safford et. al. 2022 - Safford, H. D., Paulson, A. K., Steel, Z. L., Young, D. J. N., & Wayman, R. B. The 2020 California fire season: A year like no other, a return to the past or a harbinger of the future? Global Ecology and Biogeography, 31(10), 2005–2025.

Safford et. al. 2014 - Safford, H. D., Van de Water, K. M., & U.S. Department of Agriculture Pacific Southwest Research Station, F. S. Using fire return interval departure (FRID) analysis to map spatial and temporal changes in fire frequency on national forest lands in California. Accessed online at: https://doi.org/10.2737/PSW-RP-266

Science News Explores 2018. California's Carr Fire spawned a true fire tornado. Accessed February 2024. Accessed online at: https://www.snexplores.org/article/californias-carr-fire-spawned-true-fire-tornado

Shasta County 2016. Shasta County Communities Wildfire Protection Plan 2016 - Western Shasta Resource Conservation District. Accessed February and March 2024. Accessed online at: https://scfsc.specialdistrict.org/files/e75d6f8e3/Shasta+communities+CWPP+%282016%29.pdf

Shasta County 2018a – Shasta County General Plan, Chapter 5.4 Fire Safety and Sheriff Protection, updated 2018. Accessed January and February 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3048/56hazmat.pdf

Shasta County 2018a – Shasta County General Plan, Chapter 5.6 - Hazardous Materials, updated 2018. Accessed January and February 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3048/56hazmat.pdf

Shasta County 2023. Shasta County Multi-Jurisdictional Hazard Mitigation Plan, dated April 18, 2023. Accessed February and March 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3048/54firesafety.pdf

Shasta County 2024. Shasta County Office of Education Map website. Accessed July 2024. Accessed online at: https://gis.shastacounty.gov/portal/apps/webappviewer/index.html?id=3c06c6432f224402901aba2d67638888

Stantec 2023c – (TN 253505). Fire_Fountain Wind Tech Report, dated December 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024j – (TN 254350). Responses to Post-Scoping Data Requests, dated February 6, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024p – (TN 254794). FWP Description Update, dated March 4, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024u – (TN 255883). FWP Wildfire Response to ROCs Memo, dated April 23, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024cc – (TN 260271). Wildfire Supplemental Information - memo, dated November 25, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Steel et. al. 2015 - Steel, Z. L., Safford, H. D., & Viers, J. H. The fire frequency-severity relationship and the legacy of fire suppression in California forests. Ecosphere, 6(1), 1–23.

SWRCB 2024 – State Water Resources Control Board. GeoTracker website. Accessed February 2024. Accessed online at: https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=oak+run%2C+california

Syphard et. al. 2011 - Syphard, A. D., Clarke, K. C., Franklin, J., Regan, H. M., & McGinnis, M. Forecasts of habitat loss and fragmentation due to urban growth are sensitive to source of input data. Journal of Environmental Management, 92(7), 1882–1893. Accessed online at: https://doi.org/10.1016/j.jenvman.2011.03.014

Syphard, Kelley, et. al. 2011 - Syphard, A. D., Keeley, J. E., & Brennan, T. J. (2011). Comparing the role of fuel breaks across southern California national forests. Forest Ecology and Management, 261(11), 2038–2048. Accessed online at: https://doi.org/10.1016/j.foreco.2011.02.030

Syphard et. al. 2017 - Syphard, A. D., Keeley, J. E., Pfaff, A. H., & Ferschweiler, K. Human presence diminishes the importance of climate in driving fire activity across the United States. Proceedings of the National Academy of Sciences of the United States of America, 114(52). Accessed online at: https://doi.org/10.1073/pnas.1713885114

Syphard et. al. 2019 - Syphard, A. D., Rustigian-Romsos, H., Mann, M., Conlisk, E., Moritz, M. A., & Ackerly, D. The relative influence of climate and housing development on current and projected future fire patterns and structure loss across three California landscapes. Global Environmental Change, 56(November

2018), 41–55. Accessed online at: https://doi.org/10.1016/j.gloenvcha.2019.03.007

Syphard et. al. 2022 - Syphard, A. D., Keeley, J. E., Gough, M., Lazarz, M., & Rogan, J. What makes wildfires destructive in California? Fire, 5(5), 133. Accessed online at: https://www.mdpi.com/2571-6255/5/5/133

Urza et. al. 2023 - Urza, Alexandra K., Brice B. Hanberry, and Theresa B. Jain. "Landscape-scale fuel treatment effectiveness: lessons learned from wildland fire case studies in forests of the western United States and Great Lakes region." Fire Ecology 19, no. 1 (2023): 1. Accessed online at: https://link.springer.com/content/pdf/10.1186/s42408-022-00159-y.pdf

Williams et. al. 2019 - Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. Observed impacts of anthropogenic climate change on wildfire in California. Earth's Future, 7(8), 892–910.

Zhang et. al. 2008 - Jianwei Zhang, Jeff Webster, Robert F. Powers, and John Mills. "Reforestation after the Fountain fire in northern California: an untold success story" in Journal of Forestry, Vol. 106(8): 425-430. Accessed February 2024. Accessed online at: https://www.fs.usda.gov/research/treesearch/41739

5.8 Land Use and Agriculture

5.8.1 Environmental Setting

The land use and agriculture analysis is focused on the proposed project's consistency with existing land use resources, land use plans, laws, ordinances, regulations, standards (LORS), and the proposed project's compatibility with existing or reasonably foreseeable land uses. In general, construction and operation of a wind energy facility could be incompatible if there is a substantial preclusion of the use, or if it would conflict with existing zoning. Additional impacts to surrounding land uses associated with noise, dust, traffic, and visual changes are discussed in detail in relevant sections of this Staff Assessment.

Existing Conditions

Study Area

The extent of the area to be analyzed for land use and agriculture impacts is considered the Land Use Study Area. The Land Use Study Area is defined as the geographic area within which the proposed project may directly or indirectly affect an identified existing land use, including agricultural resources. To determine the appropriate study area for the land use analysis, CEC staff has reviewed several filings by the applicant related to the proposed project area. On June 1, 2023, the applicant docketed a revised list of parcels for which the applicant has site control, and within which project activities could occur (FWPA, TN 250435). This list of parcels is identified by staff as the proposed project area, which is illustrated in Figures 5.8-1a through 5.8-1d. The Land Use Study Area is further defined as the following:

- Land uses within the boundaries of the proposed project area;
- Land uses immediately adjacent to construction or operation activities within the proposed project area; and
- Land uses located along the construction and maintenance transport routes.

Notable land uses and sensitive receptors within the Land Use Study Area are listed in **Table 5.8-1**. Each land use has been assigned an ID number corresponding to its location in **Figures 5.8-1a** through **5.8-1d**. A sensitive receptor is defined as a land use that is particularly sensitive to nuisance effects from construction, operation, and maintenance (e.g., noise, dust, traffic). Examples include residences, schools, hospitals, lodging and campgrounds, libraries, churches, nursing homes, auditoriums, and parks.

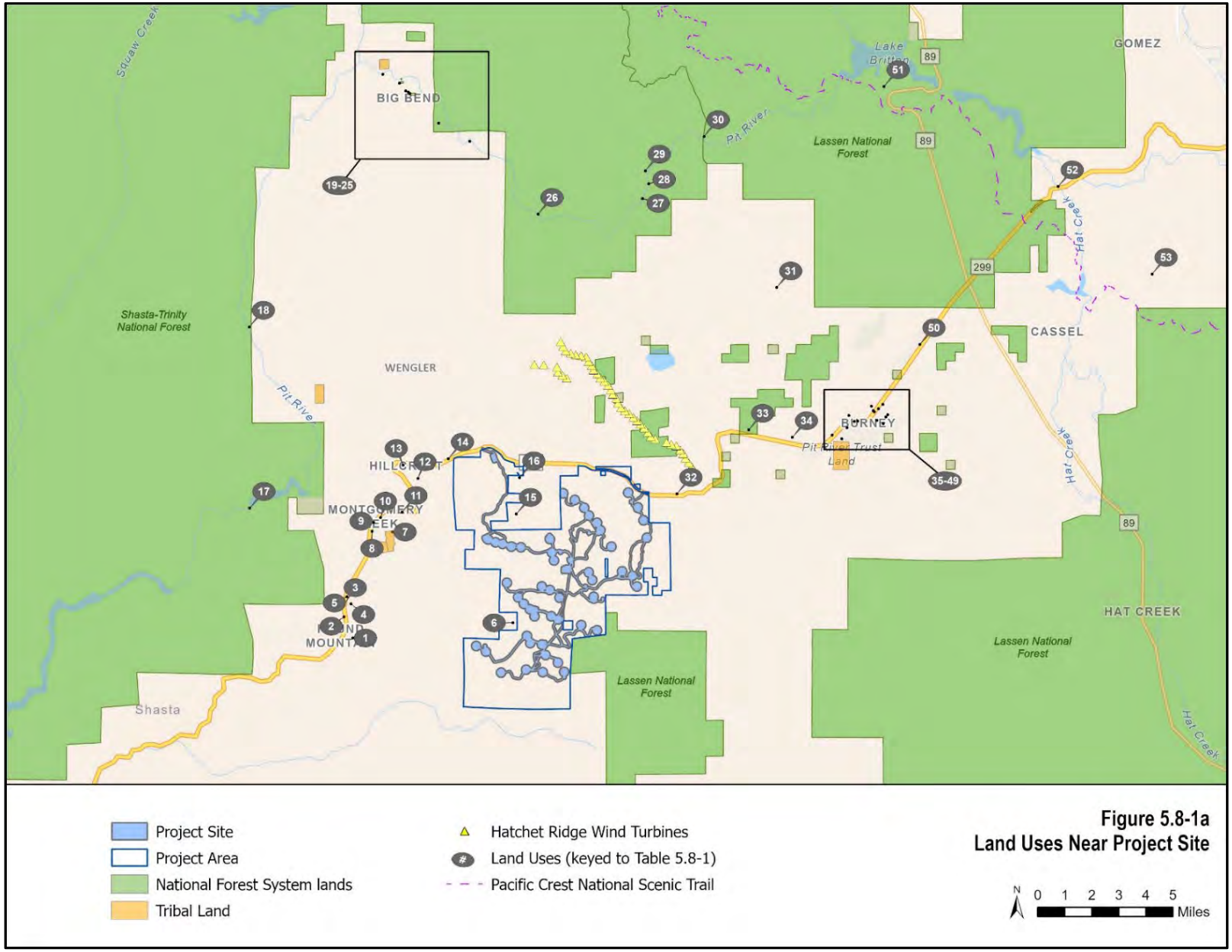


Figure 5.8-1a
Land Uses Near Project Site

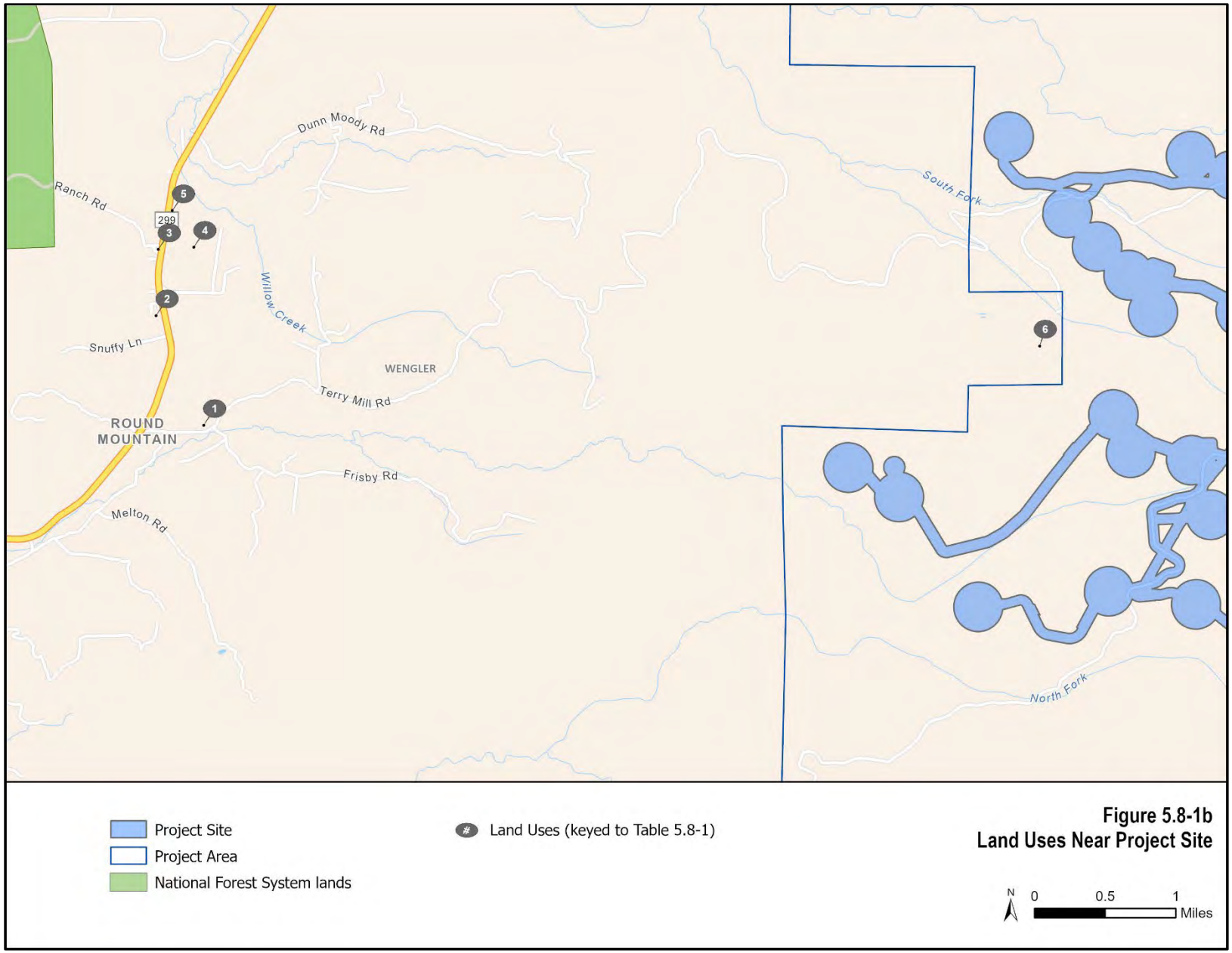


Figure 5.8-1b
Land Uses Near Project Site

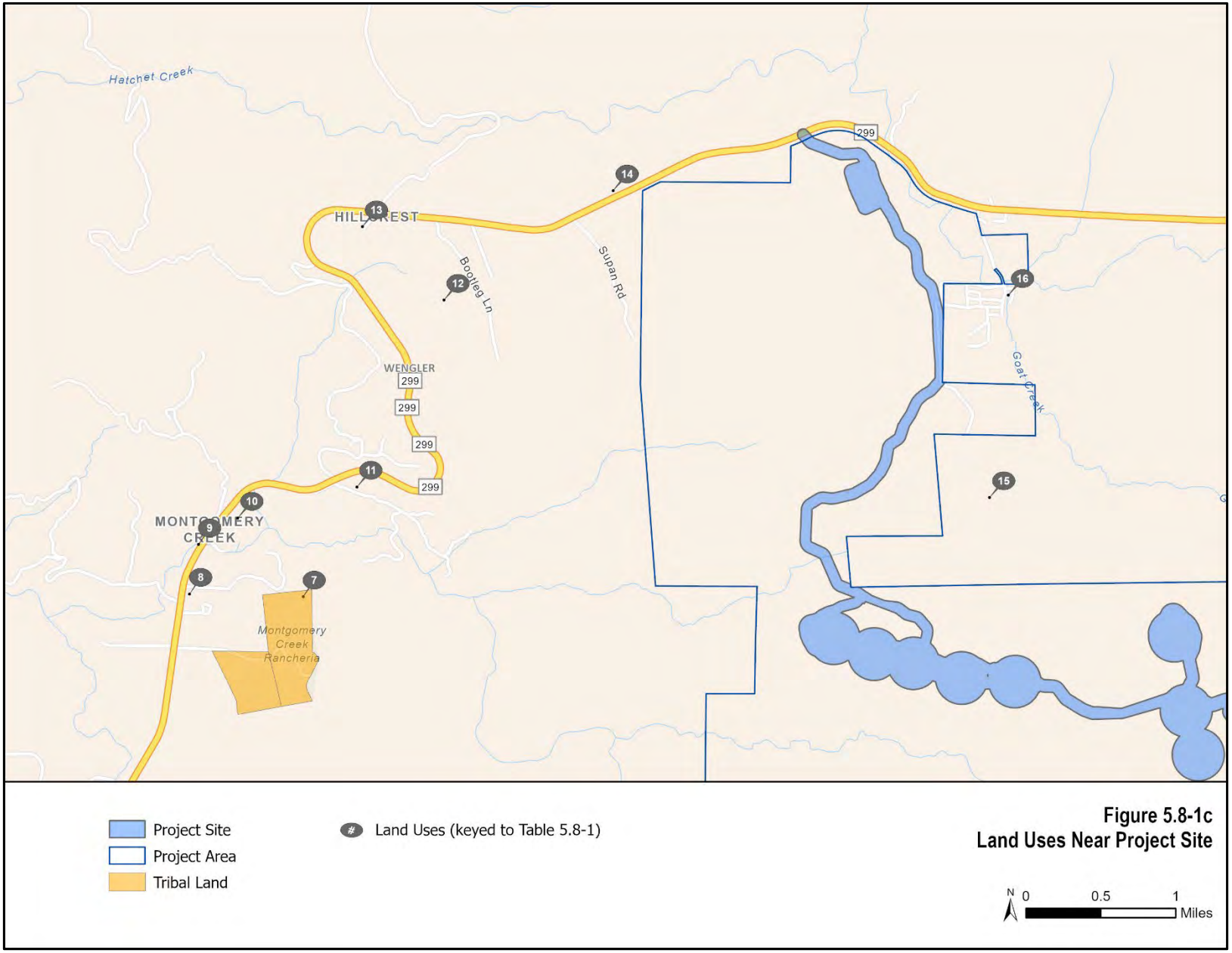


Figure 5.8-1c
Land Uses Near Project Site

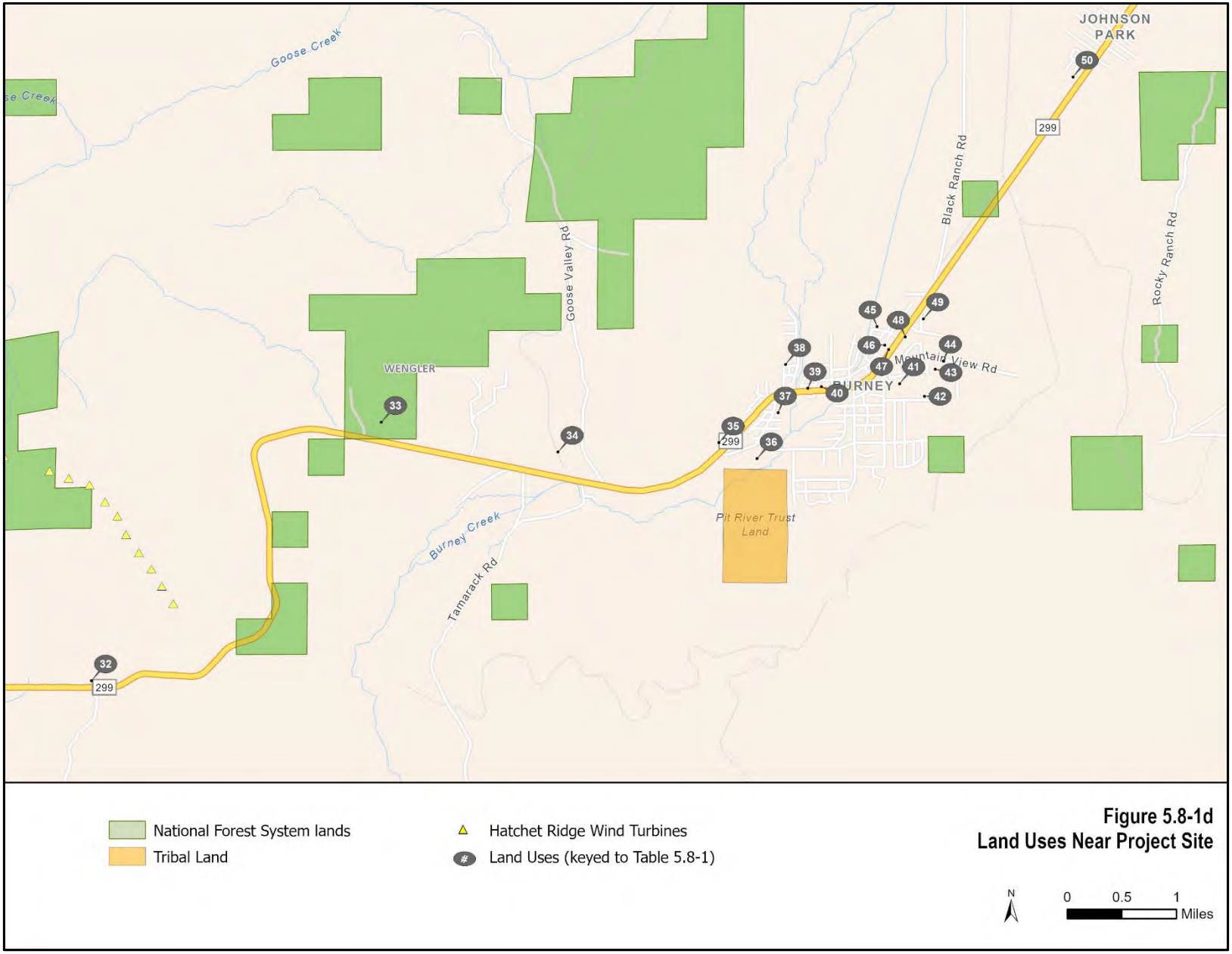


Figure 5.8-1d
Land Uses Near Project Site

TABLE 5.8-1 NOTABLE LAND USES AND SENSITIVE RECEPTORS

Map Key	Land Use	Land Use Type	Land Use Description	Location	Shasta County General Plan Land Use Designation	Shasta County Zoning Designation[1]	Sensitive Receptor[2]
1	Round Mountain Seventh Day Adventist Church	Institutional	Church	29836 Terry Mill Rd, Round Mountain	Rural Residential A	R-R	X
2	Post Office	Institutional	Post office	29620 State Route (SR) 299 E, Round Mountain	Mixed Use	MU	NA
3	Montgomery Creek Volunteer Fire Company - Fire Station 71	Institutional	Fire station	29876 SR 299, Round Mountain	Mixed Use	MU	NA
4	Substation	Industrial	Substation	Across from Montgomery Creek VFC on Substation Road	Rural Residential B	U	NA
5	Mountain Community Center	Recreation	Community center	29775 SR 299, Round Mountain	Rural Residential B	U	X
6	Dogwood Acres LLC (DALLC)	Residential; Recreation	Seasonal residence used by DALLC members	Adjacent to project area, approximately 1,500 feet southwest of proposed Turbines K03 and K04	Timber	U	X
7	Montgomery Creek Rancheria	Tribal	Pit River Tribe	Approximately 109-acre tract east of SR 299	Public Land	U	X
8	Montgomery Creek Community Church	Institutional	Church	30223 SR 299, Montgomery Creek	Rural Residential B	R-L-T-BA-10	X
9	Montgomery Creek Market	Commercial	Grocery	31430-31458 SR 299, Montgomery Creek	Mixed Use	C-2	NA
10	Montgomery Creek Elementary	Institutional	School	30365 SR 299, Montgomery Creek	Mixed Use	PF	X
11	Troxell's Big Red Orchard	Commercial; Agricultural	Orchard, tourism	19269 Montgomery Valley Drive, Montgomery Creek	Rural Residential A	R-R	NA

TABLE 5.8-1 NOTABLE LAND USES AND SENSITIVE RECEPTORS

Map Key	Land Use	Land Use Type	Land Use Description	Location	Shasta County General Plan Land Use Designation	Shasta County Zoning Designation[1]	Sensitive Receptor[2]
12	Oak Run Lumber Co	Commercial	Lumber store	19880 Bootleg Ln, Montgomery Creek	Timber	TP	NA
13	Montgomery Creek VFC-71 Sta2	Institutional	Fire station	19914 Hillcrest Dr, Montgomery Creek	Timber	C-R	NA
14	CAL Fire Hillcrest Station # 75	Institutional	Fire station	31385 SR 299, Montgomery Creek	Public Land	TP	NA
15	Lammers Ranch	Agriculture; Residential	Cattle Ranch	Adjacent to proposed project area on northwest side	Timber	U	X
16	Moose Camp	Residential; Recreation	Mix of permanent and seasonal residents	Approximately 146-acre tract south of SR 299 that is adjacent to the proposed project area	Timber	TP	X
17	Pit 7 Powerhouse	Industrial	Hydroelectric power generation	Fenders Ferry Road Montgomery Creek	Public Land	U	NA
18	Pit 6 Powerhouse	Industrial	Power generation	Montgomery Creek	Timber	TP	NA
19	Big Bend Hot Springs	Recreation	Campground, hot springs, conservation, spiritual center	Located in Madesi Territory, in the town of Big Bend. Geothermal springs located on the banks of Pit River between Mt. Shasta and Lassen Peak	Rural Residential A	C-R	X
20	Camp Site Pros Pit River	Recreation	RV park	25200 Big Bend Rd. Big Bend	Rural Residential A	MU	X
21	Indian Springs Elementary School	Institutional	School	25299 Big Bend Rd, Big Bend	Mixed Use	U	X
22	SCFD Company 70 - Big Bend	Institutional	Fire station	25017 Big Bend Rd, Montgomery Creek	Timber	TP	NA
23	Cal FIRE Big Bend - Station 19	Institutional	Fire station	Big Bend	Public Land	U	NA

TABLE 5.8-1 NOTABLE LAND USES AND SENSITIVE RECEPTORS

Map Key	Land Use	Land Use Type	Land Use Description	Location	Shasta County General Plan Land Use Designation	Shasta County Zoning Designation[1]	Sensitive Receptor[2]
24	Pacific Service Employees Association Camp Pit River	Recreation	Campground	Montgomery Creek	Timber	TP	X
25	Madesi Campground	Recreation	Campground	Montgomery Creek	Timber	TP	X
26	Deep Creek Campground	Recreation	Campground	Montgomery Creek	Public Land	U	X
27	Gravel Bar Campground	Recreation	Campground	Big Bend	Public Land	U	X
28	Big Pine PG&E Campground	Recreation	Campground	Big Bend	Public Land	U	X
29	Ruling Creek Campground	Recreation	Campground	Big Bend	Public Land	U	X
30	Pit 3 Powerhouse	Industrial	Hydroelectric power generation	22210007000 Burney	Open Space	U	NA
31	Cropland	Agricultural	Cultivated parcels of land	Approximately 8 miles northeast of proposed project area	Agricultural Croplands	EA-AP	NA
32	Hatchet Ridge Wind Entrance Site	Industrial	Utility-scale wind facility	19400 Bunch Grass Lookout Rd, Burney	Timber	TP	NA
33	Shasta Green/ Burney Forest Power	Industrial	Sawmill operations/ Co-generation facility (30 MW)	35586 SR 299, Burney	Timber	TP	NA
34	Sierra Pacific Industries	Industrial	Sawmill operations	36336 SR 299, Burney	Industrial	M	NA

TABLE 5.8-1 NOTABLE LAND USES AND SENSITIVE RECEPTORS

Map Key	Land Use	Land Use Type	Land Use Description	Location	Shasta County General Plan Land Use Designation	Shasta County Zoning Designation[1]	Sensitive Receptor[2]
35	Las Colinas Mobile Estates	Residential	Mobile home park (55+)	36766 SR 299 East, Burney	Suburban Residential	MHP	X
36	Pit River Casino	Commercial	Casino	20265 Tamarack Ave, Burney	Suburban Residential	IR	NA
37	Mountain View High School	Institutional	School	20375 Tamarack Ave, Burney	Urban Residential	PF	X
38	Shasta County Sheriff - Burney Station	Institutional	Police	20509 Shasta St	Suburban Residential	PF	NA
39	Burney Fire Protection District	Institutional	Fire station	37072 Main St, Burney	Commercial	C-2	NA
40	Burney Library	Institutional	Library	37116 Main St, Burney	Commercial	C-2	NA
41	Burney Elementary School	Institutional	School	37403 Toronto Ave, Burney	Urban Residential	PF	X
42	Shasta Head Start Burney	Institutional	School	37494 Bailey Ave, Burney	Urban Residential	PF	X
43	Burney Junior Senior High	Institutional	School	37571 Mountain View Rd, Burney	Urban Residential	PF	X
44	Shasta College Intermountain Campus	Institutional	School	37581 Mountain View Rd, Burney	Urban Residential	PF	X
45	Mt Senior Center Apartments	Residential	Senior living center	20635 Roff Way, Burney	Urban Residential-6units/acre	PD	X
46	Caltrans Burney Maintenance Station	Institutional	Transportation	028100004000, Burney	Public Land	PF	NA
47	Highway Patrol - Burney	Institutional	Police	37332 SR 299, Burney	Public Land	PF	NA

TABLE 5.8-1 NOTABLE LAND USES AND SENSITIVE RECEPTORS

Map Key	Land Use	Land Use Type	Land Use Description	Location	Shasta County General Plan Land Use Designation	Shasta County Zoning Designation[1]	Sensitive Receptor[2]
48	Cluster of hotels/ motels (Shasta Pines Motel & Suites, Green Gables Motel & Suites, Charm Motel & Suites)	Commercial	Hotels/Motels	NE Burney on Main St	Commercial	C-2	X
49	Post Office - Burney	Institutional	Post office	20655 Commerce Way, Burney	Commercial	C-O	NA
50	Cal FIRE Burney Station # 14	Institutional	Fire station	37966 SR 299 E, Burney	Public Land	TL	NA
51	McArthur-Burney Falls Memorial State Park	Recreation	State Park	Approximately 12 miles northeast of the proposed project area, accessed via SR 299 and SR 89	Public Land	U	X
52	Hat Creek Park	Recreation	Local Park	Approximately 14 miles northeast of the proposed project area, accessed via SR 299	Timber	U	X
53	Cinder Flats State Wildlife Area	Recreation	State Wildlife Area	Approximately 10 miles northeast of Burney, off SR 299	Public Land	U	X
NA	Wengler	Residential; Open Space	Hamlet northwest of project	Approximately 6 miles northwest of proposed project area	Timber	U	NA
NA	Mixed uses of neighborhoods and businesses along Main St	Commercial; Residential	Residential areas mixed with business areas	Along SR 299 (where it becomes Main St) in Burney. Start at Las Celinas Mobile Estates to the southwest, and continue along Main St until the intersection of Black Ranch Rd to the northeast	Urban Residential; Suburban Residential; Commercial; Public Land	R-1; C-2; PF; F1; R-3	NA

TABLE 5.8-1 NOTABLE LAND USES AND SENSITIVE RECEPTORS

Map Key	Land Use	Land Use Type	Land Use Description	Location	Shasta County General Plan Land Use Designation	Shasta County Zoning Designation[1]	Sensitive Receptor[2]
NA	Johnson Park	Residential; Commercial	Community with mixed residential and businesses	Approximately 12 miles northeast of proposed project area	Commercial; Suburban Residential	TL, MHP, C-2, C-M-DR, PF, C-M,	X
NA	Pacific Crest National Scenic Trail	Recreation	National Scenic Trail	Located approximately 20.4 miles northeast of the proposed project area	Timber; Public Land	TL, TP, U	X
NA	Lassen National Forest	Recreation	Forest	Immediately southeast and adjacent to the proposed project area. Also located northeast and east of the project. Accessed via SR 44, SR 36, and SR 89	Public Land	U	X
NA	Shasta Trinity National Forest	Recreation	Forest	Approximately 4 miles north and west of proposed project area. Primarily accessed via Interstate 5	Public Land	U	X

Notes:

1 – AP = agricultural preserve; BA = the minimum lot area expressed in acres, as indicated by a number following the hyphen; C-2 = community commercial; C-M = commercial-light industrial; C-O = office commercial; C-R = recreation commercial; DR = design review; EA = exclusive agriculture; F1 = designated floodway; IR = interim rural residential; M = general industrial; MHP = mobile home park; MU = mixed use; PD = planned development; PF = public facility; R-1 = one-family residential; R-3 = multiple-family residential; R-L = limited residential; R-R = rural residential; T = mobile home; TL = timberland; TP = timber production; U = unclassified.

2 – A sensitive receptor is defined as a land use that is particularly sensitive to nuisance effects from construction (e.g., noise, dust, traffic). Examples include residences, schools, hospitals, lodging and campgrounds, libraries, churches, nursing homes, auditoriums, and parks.

Source: IT Shasta, Shasta County. General Plan and Zoning Datasets. Downloaded September 2023. https://data-shasta.opendata.arcgis.com/search?collection=
Dataset; Google Maps 2023; Google Earth Pro 7.3.6.9345.

Land Use

The Fountain Wind Project would be located in an unincorporated and rural area of Shasta County. The proposed project area includes 37 parcels of privately-owned land, which totals approximately 16,108 acres (FWPA, TN 251663). The project area is designated by the Shasta County General Plan as Timber (T) and has a zoning designation of Timber Production (TP) (COS 2023a).[1] Existing land uses within the project area consist exclusively of timber harvesting.

The Land Use Study Area includes residential, commercial, industrial, institutional, agricultural, and recreational land uses. Below is a summary of relevant land use types. Please refer to **Table 5.8-1** for a full inventory of notable land uses and sensitive receptors identified within the Land Use Study Area.

Residential. Residential land uses are located within the Round Mountain, Montgomery Creek, Big Bend, and Burney communities along SR 299. The nearest residences located adjacent to the proposed project area include:

- Moose Camp Community – 145-acre private residential tract that includes 50 cabins and is accessed via Moose Camp Road from SR 299 (Moose Camp 2023, Shasta County 2023a).
- Lammers Ranch – over 250-acre cattle ranch that includes a family residence and is accessed via Supan Road from SR 299 (Lammers 2023, Shasta County 2023a).
- Dogwood Acres LLC (DALLC) – 80-acre site that includes a seasonal residence and recreational resources, which is accessed from SR 299 along Terry Mill Road. Emergency access from the property is provided by a private segment of Terry Mill Road that extends east and north through the proposed project area (DALLC 2024, Shasta County 2023a).

Commercial. Commercial uses within the Land Use Study Area include retail and construction material supply stores as well as tourism-based uses (hotels/motels, casino) in the Montgomery Creek and Burney communities. These commercial uses are accessed directly from SR 299.

Industrial. Industrial uses within the Land Use Study Area include electric substations, hydroelectric generating facilities, sawmill operations and co-generation, and an existing wind energy facility in the Montgomery Creek and Burney communities. These industrial uses are accessed directly from SR 299.

Institutional. Institutional uses within the Land Use Study Area include churches, fire stations, police stations, post offices, schools, and a library in the Round Mountain, Montgomery Creek, Big Bend, and Burney communities. These institutional uses are

1 The purpose of the TP district is to preserve lands devoted to and used for the growing and harvesting of timber, that meet the requirements of the California Timberland Productivity Act of 1982, and to provide for uses compatible with the growing and harvesting of timber (COS 2024).

located directly along SR 299, with the exception of Big Bend, which is accessed via Big Bend Road that extends 16 miles north to this community from SR 299.

Agricultural. Agricultural uses within the Land Use Study Area include an orchard, cattle ranch, and cropland located near the Montgomery Creek community and near the proposed project area. These agricultural uses are accessed directly from SR 299.

Recreational. Designated recreational resources within the Land Use Study Area include national forests, a State park and wildlife area, and a County park listed in **Table 5.8-1**.

Agriculture

This section describes baseline conditions for agricultural resources within the Land Use Study Area. Agricultural resource data was collected from the following sources: California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program (FMMP) and Williamson Act datasets, the County's general plan and zoning designations, and aerial imagery.

The proposed project area overlaps with, and surrounds, lands designated as Important Farmland by the DOC. This includes a 28-acre area of designated Prime Farmland that is actively used for agricultural operations, which is illustrated in **Figure 5.8-2**. Per docketed files TN 250448 and TN 250705, the applicant has stated that this agricultural parcel is farmed as a hay crop (FWPA, TN 250448 and TN 250705). Review of public scoping comments submitted by the property owner indicates that the parcel is actively used for cattle ranching (Lammers 2023).

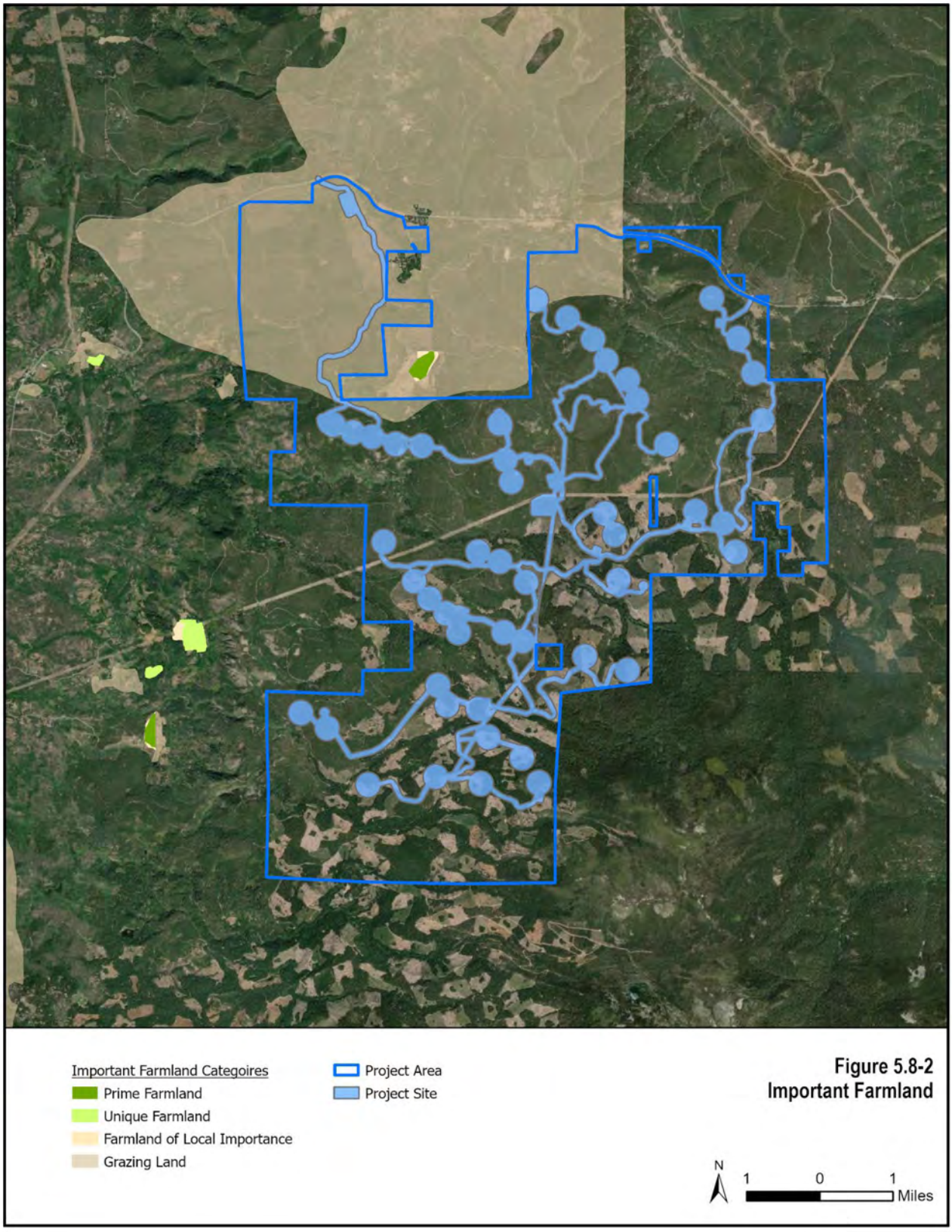


Figure 5.8-2
Important Farmland

California Department of Conservation Important Farmland

The DOC FMMP designates Important Farmland throughout the State.[2] Important Farmland categories in the Land Use Study Area[3] are illustrated in **Figure 5.8-2** and include the following:

- **Prime Farmland (P).** Prime Farmland is characterized with the best combination of physical and chemical features able to sustain long-term agricultural production (DOC 2023b). There is a 28-acre area of designated Prime Farmland located approximately 0.6 mile north of proposed turbine E05, which is the nearest turbine to this Farmland designation (DOC 2018; FWPA, TN 250835).
- **Unique Farmland (U).** Unique Farmland is characterized as lesser quality soils used for the production of the state's leading agricultural crops (DOC 2023b). The project area is located near three areas of Unique Farmland: an 8.8-acre area approximately 2.4 mile west of proposed turbine E01, a 45.4-acre area approximately 1.1 miles northwest of proposed turbine M06, and an 11.2-acre area approximately 1.5 mile west of proposed turbine M06 (DOC 2018; FWPA, TN 250835).
- **Farmland of Local Importance (L).** This Important Farmland type is characterized as having importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee (DOC 2023b). There is a 7.9-acre area of designated Farmland of Local Importance located approximately 0.6 mile north of proposed turbine E05, which is the nearest turbine to this Farmland designation (DOC 2018; FWPA, TN 250835).
- **Grazing Land (G).** Grazing Land is characterized as having vegetation that is suitable for the grazing of livestock (DOC 2023b). The proposed project area encompasses 2,477 acres of land designated by the DOC as Grazing Land (DOC 2018; FWPA, TN 250835). Grazing Land constitutes “agricultural land” for the purposes of environmental review under CEQA (DOC 2023a)

Williamson Act

The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments (e.g., Shasta County) to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive a reduction of property taxes. During this contract period (i.e., 10- or 20-year agreement), this land cannot be developed or otherwise converted to another use.

There are no lands currently enrolled in a Williamson Act contract within the project area. The nearest Williamson Act contract lands are located approximately 5.6 miles

2 FMMP Important Farmland categories include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land.

3 There is no DOC designated Farmland of Statewide Importance within the Land Use Study Area (DOC 2018).

northeast (designated Prime agriculture land) and 3.4 miles southwest (designated Nonprime agriculture land) of the project area (DOC 2022).[4]

Regulatory

There are State and local laws, ordinances, regulations, and standards (LORS) relating to land use that apply to the proposed project. Applicable land use LORS are introduced below, and a discussion of conformance with these LORS is presented in **Table 5.8-2**. Please refer to **Section 5.17, Forestry Resources**, for a discussion of State LORS relating to forest practices and timberland.

Federal

No federal land use LORS are applicable to the proposed project.

State

Subdivision Map Act (Public Resources Code sections 66410-66499.58). This section of the California Public Resources Code provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.

Local

Shasta County General Plan. The Shasta County General Plan establishes the long-range policies to guide future development within the County's unincorporated areas. It provides a policy framework that is reflected in the County's zoning ordinance, specific plans, and other development guidelines. The County's General Plan includes a Timberlands Element (Chapter 6.2) and an Energy Element (Chapter 6.4), which contain policies that are applicable to the proposed project.

Shasta County Municipal Code. The provisions of Municipal Code Title 17 (Zoning) apply throughout the unincorporated portions of the county and apply to lands owned, leased, or otherwise controlled by the state or a local government, or any unit or agency of either of them, to the extent permitted by law, or by the consent of or agreement with the state or local government or unit or agency thereof, that is affected by this title. The provisions of this title apply to public lands as defined in the Federal Land Policy and Management Act (43 U.S.C. 1701 et seq.) to the extent permitted by that act or other federal law, or regulations adopted pursuant thereto or agreements made with the county. The provisions of this title do not apply to federal reservations or to land owned, leased or otherwise controlled by the county. As used in this subsection, "local government" includes, but is not limited to, cities, school districts and special districts.

4 Prime and Nonprime agricultural land definitions under the Williamson Act program (pursuant to California Government Code Section 51201(c)) differ from the definition of Prime Farmland under the Farmland Mapping and Monitoring Program (pursuant to Government Code Sections 65560(c).

Cumulative

The Land Use Study Area defined in Section 5.8.1 includes all land uses that may be directly or indirectly affected by construction and operation of the proposed project. As the Land Use Study Area is defined broadly to encompass any potential land use and agriculture impacts, this same geographic extent would be suitable for the cumulative analysis.

Table 1-2 in **Appendix 1**, provides a list of past, present, and reasonably foreseeable projects that may be relevant to the cumulative analysis for each issue area. The following is a list of the projects that are within the geographic extent for land use and agriculture:

- Map ID #14: Diddy Roost Culverts (construction to begin 2026)
- Map ID #15: Ingot Curve Improvements (construction through January 2025)
- Map ID #16: Fenders Ferry Culverts (construction to be finished in 2023)
- Map ID #17: Potato Cut (construction to begin 2026)
- Map ID #26: Crossroads 2 (construction through January 2027)
- Map ID #19: Hatchet Ridge Wind (in operation)
- Map ID #20: Burney CAPM Project on SR 299 (construction to be finished in 2023)
- Map ID# 21: Burney Falls Pavement (construction through 2024)

Subsection 1.2.2 describes the Shasta County planning documents that provide relevant information on future development and contribute to the Cumulative Scenario. While the County's General Plan assumes that economic growth and development would occur, it also states that "…development which contributes to increased traffic and air quality impacts, is not located within planned community centers, or does not promote efficient use of land and public services may result in a development pattern which could lessen the quality of life." Shasta County further defines these quality of life factors as "clean air quality, good schools, civic and cultural opportunities, recreation and outdoor resources, lower crime rates, less traffic congestion, water quality, and low housing costs when compared to other areas."

5.8.2 Environmental Impacts

LAND USE AND AGRICULTURE	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project physically divide an established community?	☐	☐	☒	☐
b. Would the project cause a significant environmental impact due to a conflict with any land use plan,	☒	☐	☐	☐

LAND USE AND AGRICULTURE	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland.				
c. Would the project Convert Prime Farmland, Unique Farmland, or Farmland of 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?	☐	☐	☐	☒
d. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☐
e. 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?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, land use and planning and agriculture. Note that the environmental setting and analysis for forestry resources is addressed in **Section 5.17, Forestry Resources** of this Staff Assessment.

5.8.2.1 Methodology and Thresholds of Significance

To conduct the land use and agriculture analysis, staff developed an inventory of potentially affected uses within the Land Use Study Area (**Figures 5.8-1a** through **5.8-1d** and **Table 5.8-1**). Staff reviewed docket files submitted by the applicant, agencies, and the public to identify land uses. Data was also gathered through a review of aerial maps, open source geospatial data, and applicable planning and policy documents. In addition, staff reviewed LORS documents to determine consistency of the proposed project with applicable land use LORS.

Significance criteria used in this analysis are based on Appendix G of the CEQA Guidelines. An impact of the proposed project or alternative would be considered significant and would require mitigation if it would:

- Physically divide an established community.

- Conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.
- Convert agricultural resources deemed significant, such as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, to non-agricultural use.
- Conflict with zoning for agricultural use.
- Involve other changes in the environment that could facilitate the conversion of Farmland to non-agricultural use.

5.8.2.2 Direct and Indirect Impacts

a. Would the project physically divide an established community?

The following analysis focuses on the proposed project's potential to create a conflict with an established land use (e.g., preclusion of access to a land use, or interfering with ongoing land uses).

Construction

Less Than Significant Impact. The communities of Round Mountain, Montgomery Creek, Big Bend, and Burney are located along SR 299, and include residences, schools, businesses, a cattle ranch (i.e., Lammers Ranch), and other land uses identified in Figures 5.8-1a through 5.8-1d and Table 5.8-1. The daily activities of these land uses, such as use of residential and commercial properties, students traveling to and from school, and the supply of agricultural equipment and materials to the cattle ranch are dependent on access to SR 299. SR 299 is also used to access recreation areas in the study area that include Lassen National Forest, Cinder Flats State Wildlife Area, and Hat Creek Park. These recreation areas are visited frequently by local residents as well as recreationists traveling from further distances.

Construction activities would occur for approximately 28 months at the proposed project site. During the construction phase, the transport of off-road/heavy-duty construction equipment and oversize loads via SR 299 may limit or interfere with the daily activities within the communities, recreational resources, and ranching activities surrounding the project area. To prevent access disruptions for local land uses, **Section 5.14**, **Transportation**, requires the project owner to develop and implement a Construction Traffic Management Plan (**TRANS-1**) that would include requirements for maintaining access to public and private land uses and for emergency vehicles. See **Section 5.14**, **Transportation**, for a full discussion of these issues. There would be no additional impacts associated with disruptions or displacement of land uses or any division of an established community that would require mitigation. Impacts during construction would be less than significant.

Operation

Less Than Significant Impact. During the proposed project's 35-year operation phase, routine maintenance activities would primarily involve the transport of maintenance

staff and equipment utilizing light-duty trucks along SR 299 and the project access roads. Routine maintenance activities would not be anticipated to interfere with the daily activities of the land uses within the surrounding communities, surrounding the project area. However, non-routine maintenance activities such as the repair or replacement of turbine blades, and periodic grading of access roads, would require the transport and use of heavy duty equipment. To prevent access disruptions for local land uses, the applicant would develop and implement a Construction Traffic Management Plan (**TRANS-1**) that would include requirements for maintaining access to public and private land uses and for emergency vehicles. See **Section 5.14**, **Transportation**, for the full discussion of these issues. There would be no additional impacts associated with disruptions or displacement of land uses that would require mitigation. Impacts during operation would be less than significant.

b. Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Significant and Unavoidable Impact. As required by California Code of Regulations, Title 20, Division 2, Chapter 5, Appendix B(g)(3)(B), CEC staff evaluates the information provided by the applicant regarding the proposed project to determine conformity with any long-range land use plans and policies adopted by any federal, state, regional, or local planning agencies with jurisdiction over the project, or that would normally have jurisdiction over the project except for the CEC's exclusive authority. As part of the licensing process, the CEC must determine whether a proposed project complies with all applicable state, regional, and local LORS (Public Resources Code section 25523[d][1]). The CEC must either find that a project conforms to all applicable LORS or make specific findings that a project's approval is justified even where the project is not in conformity with all applicable LORS (Public Resources Code section 25525).

Shasta County Municipal Code. Applicable LORS identified in **Table 5.8-2** include the Shasta County General Plan and Municipal Code. Staff has reviewed docket filings submitted by the applicant and Shasta County regarding the County's decision to deny the applicant's 2016 permit application for the Fountain Wind Project on June 22, 2021, followed by the County's adoption of an ordinance (No. SCC 2022-04) regulating small and large wind energy systems on July 12, 2022 (FWPA, TN 248322; COS 2023b). County Ordinance No. SCC 2022-04 amended municipal code section 17.88.035 to define small and large wind energy systems, and amended code sections 17.88.100 and 17.88.335 to prohibit large wind energy systems in all zone districts of unincorporated Shasta County (COS 2023b).

The size and scale of the proposed project does not meet the definition of a "small wind energy system" defined in section 17.88.035 of the municipal code. A small wind energy system is defined as a system "used to reduce on-site consumption of utility electricity via the electric grid or to enable on-site generation of electricity in lieu of connecting to the electric grid." A small wind energy system is not meant for large-scale production or connection to the electric grid on a commercial level, and turbine heights are not to

exceed 80 feet. The proposed project would be defined as a "large wind energy system" as it would consist of 48 turbines approximately 610 feet in height, a substation, and generation interconnect (i.e., gen-tie) to a 230 kV transmission line. As a large wind energy system, the proposed project is not permitted within any zone district per code section 17.88.335(C). Given that the proposed project site is within an unincorporated area of the County, construction and operation of the proposed project would not conform with the County's municipal code.

Staff has reviewed comments submitted to the project docket by Shasta County regarding the conflict of the proposed project with County Ordinance No. SCC 2022-04. In an opposition filing that was submitted to the project docket on August 11, 2023, the County restated its 2021 decision to deny the applicant's permit application due to "impacts to aesthetics, potential increased fire danger; impediments to firefighting efforts; damage to wildlife; damage to natural resources; and damage to cultural and tribal resources" which the County determined "would be detrimental and injurious to the general welfare of people in the County and to County property" (COS 2023b). As currently proposed, the project would not conform with the Shasta County Municipal Code sections 17.88.035, 17.88.100, and 17.88.335 prohibiting a large wind energy system within an unincorporated area of Shasta County. Due to this conflict with the County's prohibition on utility-scale wind, construction and operation of the proposed project would create a significant and unavoidable impact.

As noted in subsection 5.8.1.1, the project site is designated by Shasta County as a TP district, which is equivalent to a Timberland Production Zone (TPZ) as defined under the California Timberland Productivity Act of 1982. **Section 5.17, Forestry Resources**, provides a detailed summary of the regulatory framework that guides management activities for designated timberland, including TPZs. The proposed project would be inconsistent with the intent of a TPZ, which is to preserve forest resources by restricting uses to growing and harvesting timber. See **Section 5.17, Forestry Resources**, for a detailed discussion of project conformance with TPZs.

Subdivision Map Act. Applicable LORS identified in **Table 5.8-2** also include the Subdivision Map Act, which is intended to ensure the applicant has site control prior to implementation of the proposed project. Per section 66411 of the Subdivision Map Act, "Regulation and control of the design and improvement of subdivisions are vested in the legislative bodies of local agencies." As the local planning agency, Shasta County has codified its role in implementing the Subdivision Map Act in municipal code section 15.04.010, and explains that the intent of the Act is "to encourage orderly community development by providing for the regulation and control of the design and improvement of the subdivision, … to limit undue fiscal impacts to the county; and to protect the public and transferee of parcels created through the subdivision process."

The applicant has stated that the proposed project would be sited across 37 parcels that are owned by Oxbow Timber and would be leased by the applicant (FWPA, TN 248331). The proposed project would construct and operate up to 48 singular generating turbines on disparate parcels.

Per California Code of Regulations, Title 20, Division 2, Chapter 5, Appendix B(g)(3)(C), the proposed project cannot start construction until the applicant can ensure it has site control (e.g., parcels merged or otherwise combined as a single legal parcel). Parcel mergers or the transfer of parcels are subject to the standards required by the Subdivision Map Act as set forth in section 66451.10 through section 66451.24. To comply with the Subdivision Map Act, the applicant must demonstrate site control for the entire project area during the projected life of the project (i.e., through project decommissioning) to ensure that there are no encumbrances or deed restrictions associated with each parcel upon which the project would be sited.

According to three sets of lease agreement files docketed by the applicant, the development period for the lease would expire in 2021, and the operations period for the lease would expire on May 1, 2047 (FWPA, TN 248331, TN 251202, TN 250984). On June 9, 2023, staff submitted recommendations for data adequacy stating that the applicant has not provided documentation of the lease extension for each parcel upon which the project would be sited as proof of site control throughout the entire proposed operational phase of the project (i.e., 35 years). On August 2, 2023, the applicant docketed the following response to staff (FWPA, TN 251462):

The Applicant entered into the original Option to Lease in 2012, which option was amended in 2016. A redacted copy of the Amended Option is docketed as TN #251202. Included as Exhibit B to this Amended Option is a Renewable Energy Lease Agreement, which lease will become effective upon exercise of the option. Paragraph 1.5 of the Lease Agreement calls for a term until May 1, 2047, a term of 35 years from the date of the original option agreement. (p. 30 of the pdf indicates the lease termination date of 2047.) The ability to exercise the option has been extended to 2029. See TN# 250984. The Applicant expects the landowner will extend the lease term to allow a full 35 years of operations once the CEC approves the project.

Prior to the start of construction, the applicant must demonstrate that it has site control through the life of the project to ensure compliance with the Subdivision Map Act. Implementation of **LAND-1** would bring the proposed project into compliance with this regulation.

c. Would the project Convert Prime Farmland, Unique Farmland, or Farmland of 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?[5]

For purposes of evaluating impacts to agricultural resources under CEQA, the term "Farmland" referenced in CEQA Guidelines Appendix G part (c) is specific to Prime

5 In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland.

Farmland, Unique Farmland, or Farmland of Statewide Importance as designated by the DOC. Project consistency with County zoning designations for agriculture are analyzed under part (d) of this section.

Construction

No Impact. Designated Prime Farmland and Unique Farmland (i.e., Farmland) are located approximately 0.6 mile and 1.1 mile from the nearest turbines, respectively.[6] No construction activities or access roads would be located on or immediately adjacent to these areas of Farmland. Furthermore, the boundary of the proposed project area (i.e., all parcels for which the applicant has site control) is approximately 1,000 feet from the nearest Farmland designation, and therefore any potential changes that could occur in siting infrastructure within the proposed project area would not create a disturbance to Farmland. The project's construction phase would have no impact related to conversion of State-designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (i.e., Farmland) to non-agricultural use.

Operation

No Impact. Routine and non-routine maintenance activities would not expand the project's area of disturbance beyond the construction footprint. As the operational activities would be confined to the proposed project area, there would be no disturbance to designated Prime Farmland or Unique Farmland during project operations. Therefore, the project's operational phase would have no impact related to conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (i.e., Farmland) to non-agricultural use.

d. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Williamson Act Contract

There are no lands within or adjacent to the proposed project area that are currently enrolled in a Williamson Act contract. As discussed in Section 5.8.1, the nearest Williamson Act contract lands are located approximately 3.4 miles southwest of the project area, and no construction activities or access roads would be located in proximity to lands enrolled in a contract. Project construction would not conflict with a Williamson Act contract.

Agricultural Zoning

Significant and Unavoidable Impact. All proposed construction activities would occur on lands zoned for Timber Production (TP). Per Shasta County Municipal Code section 17.08.020, grazing is a permitted use within a TP district, and approximately 2,477 acres of the proposed project area has been identified by the DOC as suitable for

6 There is no DOC designated Farmland of Statewide Importance within the Land Use Study Area (DOC 2018).

grazing. As discussed in Section 5.8.2.2 part (b) and in Table 5.8-2, a large wind energy system is specifically prohibited in all zone districts per section 17.88.335 of the municipal code. Therefore, the proposed project would not be a permitted use within the County's TP district. Due to this conflict with the existing agricultural zoning for the proposed site, construction and operation of the project would create a significant and unavoidable impact.

e. 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?

Construction

No Impact. As discussed in Section 5.8.2.2 part (c), there is no State-designated Farmland within the proposed project area. There is sufficient distance between the boundary of the project area and the nearest Farmland (i.e., Prime Farmland and Unique Farmland) and no disturbance would occur to Farmland as a result of any potential changes that would occur in siting infrastructure within the proposed project area. The project's construction phase would have no impact in terms of converting Farmland to non-agricultural use.

Operation

No Impact. As discussed in Section 5.8.2.2 part (c), operational activities would be confined to the proposed project area and there would be no disturbance to designated Prime Farmland or Unique Farmland during project operations. The project's operational phase would have no impact related to conversion of Farmland to non-agricultural use.

5.8.2.3 Cumulative Impacts

Less Than Significant Impact. A cumulative impact to land use and agriculture would occur if:

- The activities of the proposed project would overlap with the construction or operation of another project in the Land Use Study Area, resulting in a combined impact that may be equal to, or more severe than, the effects of the proposed project alone; or
- The total affected acreage or conversion of Farmland from the proposed project in combination with other projects would be cumulatively considerable.

Divide an established community. As discussed in Section 5.8.2.2 part (a), impacts to an established community can be evaluated in the context of preclusion of access or interference with ongoing use. The projects listed in **Appendix 1, Table 1-2** primarily include public works improvement projects such as bridge repairs, road improvements, and a new fire station, as well as timber clearance activities within Lassen National Forest. These projects would not create a development pattern that could preclude or interfere with established land uses, and they have been designed by Shasta County

Public Works to maintain or improve, but not lessen, the quality of life for County residents. The proposed project would avoid disruptions to land uses within the surrounding area with implementation of Traffic Management Plan (**TRANS-1**), which requires the applicant to maintain access to public and private land uses and for emergency vehicles. With implementation of **TRANS-1**, potential land conflicts would not be cumulatively considerable.

Conflict with a land use plan, policy, regulation, or zoning. The proposed project would not conform with Shasta County Municipal Code sections 17.88.035, 17.88.100, and 17.88.335, and the County has determined that the proposed project would lessen the quality of life for County residents (COS 2023b). However, the review and approval under CEC's opt-in authority is unique to the proposed project and would not apply to other projects listed in **Table 1-2**. The projects listed in **Table 1-2** primarily include public works improvement projects and timber clearance activities. These projects would not contribute to economic growth and development within Shasta County, and they have been designed by Shasta County Public Works and Lassen National Forest to maintain or improve, but not lessen, the quality of life for County residents. Foreseeable energy projects include two battery storage projects (Anderson River BESS, Crossroads 2), one solar photovoltaic/battery storage project (Meadow Ridge 2), and a STATCOM substation project (Round Mountain 500 kV Area Dynamic Reactive Support Project). The two battery storage projects are sited at existing substations and are expected to be consistent with the applicable regulations and zoning requirements for those sites. While staff does not know the exact locations of the Meadow Ridge 2 or STATCOM substation projects, these projects are not currently seeking certification under CEC's opt-in authority (CEC 2024), and therefore would be subject to planning review and permitting by the local jurisdiction. As part of that process, these projects would need to demonstrate consistency with the general plan policies and zoning requirements applicable to the site prior to approval.

Although construction and operation of the proposed project would result in a significant and unavoidable impact due to its nonconformance with the County's municipal code, this impact would be project-specific and would not combine with the projects listed in **Table 1-2** to create any cumulatively considerable impacts.

Convert Farmland to non-agricultural use. As discussed in Section 5.8.2.2 part (c), the proposed project would not directly or indirectly impact Farmland. Staff reviewed the locations of the cumulative projects listed in **Table 1-2** and determined that none of the cumulative projects located within the Land Use Study Area would be constructed on or adjacent to DOC-designated Farmland. None of the proposed project activities would combine with the effects of other projects to create a cumulatively considerable impact to Farmland.

Conflict with a Williamson Act contract. As discussed in Section 5.8.2.2 part (d), the proposed project would not directly or indirectly impact a Williamson Act contract. Staff reviewed the locations of the cumulative projects listed in **Table 1-2** and determined that none of the cumulative projects located within the Land Use Study

Area would be constructed on lands enrolled in a Williamson Act contract. Proposed project activities would not combine with the effects of other projects to create a conflict with a Williamson Act contract, and there would be no cumulatively considerable impacts.

5.8.3 Project Conformance with Applicable LORS

Table 5.8-2 contains staff's determination of conformance with applicable LORS, including any conditions of certification (COCs), where applicable, to ensure the project would comply with LORS. The subsection below, "Proposed Conditions of Certification," contains the full text of the referenced COCs for LORS impacts where COCs can be applied to reduce impacts to less-than-significant levels. As shown in this table, the proposed project would not be consistent with several applicable LORS.

TABLE 5.8-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
State	
Subdivision Map Act (Public Resources Code sections 66410-66499.58)	
This section of the California Public Resources Code provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.	**Yes.** The proposed project would construct and operate up to 48 singular generating turbines on 37 disparate parcels that would be leased by the applicant. As discussed under Section 5.8.2.2 (b), the current lease for the 37 parcels would expire in 2047, which does not allow for a full 35 years of project operations. The applicant has stated that it expects to secure an extension of the lease once the project is approved by the CEC. However, per Cal. Code Regs., Tit. 20, Division 2, Chapter 5, Appendix B(g)(3)(C), the proposed project cannot start construction until the applicant can ensure it has site control (e.g., parcels merged or otherwise combined as a single legal parcel). Parcel mergers or the transfer of parcels are subject to the standards required by the Subdivision Map Act as set forth in section 66451.10 through section 66451.24. To comply with the Subdivision Map Act, the applicant must demonstrate site control for the entire project area during the projected life of the project to ensure no encumbrances or deed restrictions are associated with each parcel upon which the project would be sited. Implementation of **LAND-1** would be required to bring the proposed project into compliance with this regulation.
Local	
Shasta County General Plan	
Chapter 6.2 – Timberlands Element	
Policy T-b. Timberlands within a TPZ shall be regulated as to use and subdivision as set forth in the [Forest Taxation Reform] Act. In addition to the permitted uses listed in the Act, other related and compatible uses may be conditionally permitted under applicable provisions of the Zoning Plan.	**No.** The proposed project is within a TPZ (e.g., TP district). Section 17.08.010 of the municipal code identifies uses that are permitted outright within a TP district as well as activities or uses that would require a use permit. As addressed in the consistency analysis for municipal code section

TABLE 5.8-2 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
	17.08.020, construction of an electrical facility may qualify for a use permit in a TP district. However, a large wind energy system is specifically prohibited in all zone districts per section 17.88.335 of the municipal code. As the proposed project would not be a permitted use per the municipal code sections applicable to a TPZ, the project would be inconsistent with Policy T-b.
Policy T-c. Timberlands submitted for entrance into a TPZ in accordance with the [Forest Taxation Reform] Act shall be comprised of single or contiguous parcels whose resource value(s) and size(s) comply with Table T-3 [Timber Site Classification and Parcel Size Requirements].	**Yes.** The proposed project site consists of 37 private parcels within a TP district. These parcels are owned by Oxbow Timber and would be leased by the applicant. To demonstrate site control through the life of the project, the applicant would be required to implement **LAND-1**. **LAND-1** would ensure legality of parcels in compliance with the Subdivision Map Act (Pub. Resources Code section 66410-66499.58), and would ensure that parcels within the proposed project area would continue to meet the parcel size requirements for a TPZ (e.g., TP district) as listed in Table T-3 of the Timberlands Element.
Chapter 6.4 – Energy Element	
Policy E-d. Priority shall be given to energy projects and programs that provide jobs and other economic benefits within the County for County residents.	**Yes.** The application for the proposed wind energy project is being reviewed under the CEC's opt-in authority. To approve an opt-in project, the CEC must find that the project will provide an overall net positive economic benefit to the local government, that the applicant has entered into a community benefits agreement, and that the applicant has certified payment of prevailing wage, or equivalent, for all construction, and the use of a skilled and trained workforce, or equivalent, for all construction (CEC 2023p). Project certification under the opt-in process would ensure consistency with Policy E-d.
Title 17 – Zoning of Shasta County – Municipal Code	
Chapter 17.08 – Timber Production (TP) District	
17.08.010 - Purpose. To preserve lands for timber growth and harvesting in compliance with the California Timberland Productivity Act of 1982, and to ensure compatibility with uses associated with timber production.	**No.** The purpose of a TP district is to preserve lands specifically for the growing and harvesting of timber and to provide for uses compatible with this primary use, as stated in section 17.08.010 of the municipal code.
17.08.020 - Permitted Uses. The following uses are permitted outright in the TP district: • Forest management; • Grazing, beekeeping, watershed management, fish and wildlife habitat; • Hunting, fishing, camping and similar recreational uses not involving any permanent improvement of the land or interfering materially with the primary use; • Christmas tree farm.	The project includes timber clearance and harvesting to develop the wind energy project, which entails the removal of existing commercial and pre-commercial timber from the project site. Although timber harvesting is a permissible activity within the TP zoning designation, the purpose of timber removal in the context of the project would be to facilitate the construction of wind turbines and associated infrastructure, which do not comply with the provisions of section 17.08.020 of the municipal

TABLE 5.8-2 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
17.08.030 - Uses Requiring Use Permit. The following uses are permitted in the TP district if a use permit is issued: • Living quarters for persons fully and necessarily employed on the premises; • Other uses indirectly incidental to forest management, including permanent wood processing installations; • Development and use of mineral resources, provided the development would not detract from use of the property for forest management; • Erection, construction or alteration of a gas, electrical, water, or communication facility, or other public improvements; • Processing of diatomaceous earth processing under specific conditions.	code. Therefore, the proposed project is not permitted outright as a use under this code section. Section 17.08.030 of the municipal code identifies projects that may quality for a use permit within a TP district. Such projects must demonstrate that they would not significantly detract from the use of the property for forest management. While construction of an electrical facility is identified as a use that may qualify for a use permit, a large wind energy system is specifically prohibited in all zone districts per section 17.88.335 of the municipal code. Therefore, the proposed project would not meet the requirements for a permitted use per code section 17.88.030.
17.08.040 – Area Requirements. The land in a TP district must be in the ownership of one person, as defined in Section 38106 of the Revenue and Taxation Code, and shall be comprised of single or contiguous lots of a total size not less than indicated in Table 17.08.040 (Timber Site Classification and Parcel Size Requirements)	**Yes.** The proposed project site consists of 37 private parcels within a TP district. These parcels are owned by Oxbow Timber and would be leased by the applicant. To demonstrate site control through the life of the project, the applicant would be required to implement **LAND-1**. **LAND-1** would ensure legality of parcels in compliance with the Subdivision Map Act (Pub. Resources Code section 66410-66499.58), and would ensure that parcels within the proposed project area would continue to meet or exceed the minimum parcel size required for a TP district as identified in the County's municipal code, Table 17.08.040.
Chapter 17.88 – Special Uses	
Article I. – Uses Permitted in All Districts	
17.88.010 – Generally. The uses described in Sections 17.88.020 through 17.88.110 of Article I may be located in most or all districts, subject to the specified limitations and requirements, unless the use directly conflicts with a specific district regulation. 17.88.100. – Public uses, public utilities, and high voltage electrical transmission and distribution projects. (B) Public uses and public utilities, with the exception of large wind energy systems as defined in subsection 17.88.335.B. of this chapter, are permitted if a use permit is issued, except that public utility transmission lines, towers, distribution poles and lines, regardless of height, and gas pipelines, which are not associated with high voltage electrical transmission and distribution projects, are permitted uses.	**No.** While municipal code section 17.88.100 identifies public utilities and transmission infrastructure as a special use permitted in all districts, a large wind energy system is specifically prohibited in all zone districts per section 17.88.335 of the municipal code. Therefore, the proposed project would not meet the permit requirements for a special use per code section 17.88.100.
Article III. – Other Special Uses	

TABLE 5.8-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
17.88.335 – Large wind energy systems. (B) Definitions. "Large wind energy system" means a wind energy conversion system that is not defined as a small wind energy system pursuant to subsection 17.88.035(A) of this chapter. (C) Prohibition. Large wind energy systems are prohibited in all zone districts of the unincorporated area of the county of Shasta and no permit or approval of any type shall be issued therefor.	**No.** The size and scale of the proposed project does not meet the definition of a "small wind energy system" defined in section 17.88.035 of the municipal code. A "small wind energy system" is defined as a system that reduces on-site consumption of utility electricity or enables on-site generation of electricity and is not meant for large-scale production or connection to the electric grid on a commercial level. Tower heights may not exceed 80 feet with an approved administrative permit. The proposed project would be defined as a "large wind energy system" as it would consist of 48 wind turbines with heights up to 610 feet, and would connect to the electrical grid through a proposed substation to be constructed along an existing transmission line. As a large wind energy system, the County would not permit the proposed project within any zone district per section 17.88.335(C). Given that the proposed project site is within an unincorporated area of the County, construction and operation of the proposed project would not be consistent with the County's municipal code given that code section 17.88.335 expressly prohibits siting of large wind energy systems in all zone districts of Shasta County's unincorporated areas.

5.8.4 Conclusions and Recommendations

As discussed in subsection 5.8.2.2, the proposed project would have a less-than-significant impact associated with division of an established community, and no agricultural land conversion impacts including Farmland. With implementation of **LAND-1**, the proposed project would conform with the Subdivision Map Act (Public Resources Code sections 66410-66499.58). However, the project would not conform with Shasta County Municipal Code sections 17.88.035, 17.88.100, and 17.88.335 prohibiting a large wind energy system within an unincorporated area of Shasta County. There is no feasible mitigation that would bring the proposed project into conformance with the County's municipal code.

As discussed in subsection 5.8.2.3, the project would not create an impact to land use or agricultural resources that would be cumulatively considerable.

5.8.5 Proposed Conditions of Certification

The following proposed COCs would ensure conformance with LORS, where applicable.

LAND-1 The project applicant shall submit proof of a lease extensions for each of the 37 parcels within the proposed project area to ensure site control. The lease

extension duration must be of a sufficient length to allow use of each of the 37 parcels for the project's 35-year operation period and subsequent 2-year decommissioning period.

Verification: At least 30 days prior to the start of construction activities, the proof of lease extensions for the 37 parcels shall be submitted to the Compliance Project Manager (CPM) to ensure the applicant has site control during the life of the project and in compliance with the Subdivision Map Act (Pub. Resources Code section 66410-66499.58) and Cal. Code Regs., Tit. 20, Division 2, Chapter 5, Appendix B(g)(3)(C).

5.8.6 References

CEC 2024 – California Energy Commission. Power Plant Listing. Opt-in Proceeding Type. Accessed February 1, 2024. Accessed online at: https://www.energy.ca.gov/proceedings/power-plant-listing

CEC 2023p – California Energy Commission (TN 253297). California Energy Commission Opt-In Certification, dated November 22, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024 – County of Shasta. Shasta County Code. Codified through Ordinance No. 2024-07. Updated September 30, 2024. Accessed on October 2, 2024. Accessed online at: https://www.shastacounty.gov/planning

COS 2023a – County of Shasta. Shasta County Map Viewer. Updated October 15, 2023. Accessed on October 2, 2024. Accessed online at: https://www.shastacounty.gov/information-technology/page/geographic-information-systems-gis-division

COS 2023b – County of Shasta (TN 251601). Shasta County Opposition to AB 205 Jurisdiction and Objection to Notice of Completion Request, dated August 14, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

DALLC 2024 – Dogwood Acres, LLC (TN 253851). Dogwood Acres LLC Comments on the Scope & Content of Draft EIR, dated January 10, 2024. Accessed January 10, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

DOC 2023a – California Department of Conservation. Farmland Mapping and Monitoring Program: Laws and Policy. Accessed November 16, 2023. Accessed online at: https://www.conservation.ca.gov/dlrp/fmmp/Pages/Laws-and-Policy.aspx

DOC 2023b – California Department of Conservation. Important Farmland Categories, dated December 2023. Accessed November 14, 2023. Accessed online at: https://www.conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx

DOC 2022 – California Department of Conservation. California Williamson Act Enrollment Finder, dated December 2022. Accessed November 14, 2023. Accessed online at: https://maps.conservation.ca.gov/dlrp/WilliamsonAct/

DOC 2018 – California Department of Conservation. California Important Farmland Finder. Shasta County Important Farmland data, last updated 2018. Accessed November 16, 2023. Accessed online at: https://maps.conservation.ca.gov/DLRP/CIFF/

FWPA – Fountain Wind Project Application (TN 248322). Executive Summary and Project Description, dated January 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248331). Lease with Oxbow Holdings, dated January 5, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250435). LU-008 Parcels Numbers Rev2, dated June 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250448). Land Use Responses, dated June 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250705). Land Use Responses, dated June 21, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250835). File Submittal Memo, dated June 29, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250984). LU-008, LU2-05 Executed Option Amendment, dated July 10, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251202). Option Lease Redacted, dated July 27, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251462). Memo LU, SOC, ALT, dated August 2, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Lammers 2023 – John W. Lammers (TN 253379). PDF of powerpoint presentation outlining the devastating impacts to the Lammers Properties, dated November

28, 2023. Accessed December 19, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Moose Camp 2023 – Moose Camp (Moose Camp). Fountain Wind Project. Accessed on December 12, 2023. Accessed online at: https://www.moosecamp.org/fountain-wind-project

5.9 Noise and Vibration

5.9.1 Environmental Setting

Existing Conditions

The Fountain Wind Project (FWP or project) area consists primarily of managed forest land uses (FWPA TN#248288-15, Section 3.13.3.2). The proposed project would be located on 37 parcels encompassing approximately 16,108 acres, of which 2,855 acres would be used for infrastructure and construction activities (FWPA TN#251663).

The project is located immediately south of State Route (SR) 299 and approximately one mile west of the Hatchet Ridge wind project. The nearest residence to any single turbine (this residence is identified as R-4) is approximately 5,000 feet away. The predominant ambient noise source is traffic on SR-299 (FWPA TN#248288-15, Section 3.13.1.2). A 192-hour long-term ambient noise monitoring survey was conducted at multiple residential receptors near the project site from August 19th to August 27th, 2018 (FWPA TN#248288-15, Section 3.13.1.2, and FWPA TN#251663, Section 1.3). The applicant surveyed four monitoring locations—LT-1 and LT-2 residences approximately 1.5 miles away from the location of the nearest turbine; LT-3 located close to SR-299, representing residences approximately 1.5 miles from the location of the nearest turbine; and LT-4 located north of the southern residence, approximately 1.3 miles from the location of the nearest turbine. The average ambient sound levels measured at LT-1, LT-2, LT-3, and LT-4 during daytime hours (7 A.M. to 10 P.M.) were approximately 40, 38, 47, and 42 decibels on the A-weighted scale (dBA) L_{eq},[1] respectively. During nighttime hours (10 P.M. to 7 A.M.), the average ambient sound levels measured at LT-1, LT-2, LT-3, and LT-4 were approximately 36, 34, 46, and 42 dBA, respectively (FWPA TN#248288-15, Section 3.13.1.2).

The environmental setting surrounding LT-4 and R-4 are very similar, and therefore, their ambient noise levels would be very similar. Thus, in the absence of ambient noise measurements at R-4, the ambient noise levels at R-4 would be assumed to be equivalent to the average ambient sound levels recorded at LT-4, which is the nearest surveyed monitoring location to R-4.

Regulatory

Federal

Occupational Safety and Health Act (OSHA). The Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. Section 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed. The regulations further specify

1 L_{eq} is a measurement of average energy level intensity of noise over a given period of time.

a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

State

Cal-OSHA. Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, Section 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards.

Local

Shasta County General Plan Noise Element. Shasta County General Plan Noise Element sets standards for noise control. The Noise Element defines "sensitive receptors" to include residential areas, parks, schools, churches, hospitals, and long-term care facilities (Shasta 2004). This noise element outlines the noise level performance standards for new projects: During daytime hours, from 7 A.M. to 10 P.M., the hourly L_{eq} should not exceed 55 dBA, while for nighttime hours, from 10 P.M. to 7 A.M., this limit reduced to 50 dBA (Shasta 2004, Table N-IV). According to the noise element, in rural areas where large lots exist, these exterior noise level standards shall be applied at a point 100 feet away from the residence.

Cumulative

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this staff assessment.

However, the FWP would have no cumulative noise impacts with past, present, or probable future projects, because there are no other projects close enough to consider.

5.9.2 Environmental Impacts

NOISE AND VIBRATION	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. For a project located within the vicinity of a private airstrip or 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?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, noise.

5.9.2.1 Methodology and Thresholds of Significance

The construction and operation of any power plant creates noise, or undesired sound. The character and loudness of this noise, the times of day or night that it occurs, and the proximity of the facility to sensitive receptors (humans) combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts.

In addition, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

Methodology

The California Environmental Quality Act (CEQA) Guidelines state that a project would normally be considered to have a significant impact if noise levels conflict with adopted environmental standards or plans (County's noise level threshold), or if noise levels generated by the project would substantially increase existing ambient noise levels at noise-sensitive receivers on a permanent or temporary basis.

Thresholds of Significance

Generally, an increase of 3 dBA is noticeable and an increase of 5 dBA is distinct. Other factors, such as the frequency of occurrence of the noise and time of day/night it

occurs, are also commonly considered in determining if such an increase is clearly significant or not.

There are no adopted thresholds for an increase in dBA level to be considered a significant impact for construction activities. Noise due to construction activities are considered to be less than significant if the construction activity is temporary and the use of heavy equipment and noisy activities is limited to daytime hours. However, an increase of 10 dBA or more during the day can be perceived as noisy (triggering a community reaction) and warrant additional measures to address the noise levels. An increase of 10 dBA corresponds to a doubling of loudness or dBA level and is generally considered to be the starting point at which significant noise impacts may occur (triggering a community reaction). It is very difficult to identify the exact level of noise resulting from construction because it fluctuates based on many factors over the course of a week, day, or even hour. It also depends on other factors, such as intervening structures, land topography and land cover. For example, intervening structures block or impede sound waves, and undulating topography and land roughness would play a role in attenuating the propagation of noise waves. Therefore, performance standards (i.e., a complaint and redress process) are ultimately used as a backstop measure to address any impacts that are perceived by the community.

Shasta County General Plan Noise Element establishes noise level thresholds and noise limitations for new projects.

In September 2013, the California Department of Transportation (Caltrans) released the Transportation and Construction Vibration Guidance Manual. This manual includes the Federal Transit Administration's (FTA) methods and findings. The Caltrans manual states that for construction activities that generate vibration, the threshold of human response begins at a peak particle velocity (PPV) of 0.16 inch per second (in/sec). This is characterized by Caltrans as a "distinctly perceptible" event with an incident range of transient to continuous (Caltrans 2013). A level of 0.20 in/sec has been found to be annoying to people in buildings and can pose a risk of architectural damage to buildings.

5.9.2.2 Direct and Indirect Impacts

a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Less Than Significant Impact with Mitigation. The County General Plan does not establish noise level thresholds for construction activities. Although, for discretionary projects, construction activities shall be limited to hours of 7:00 A.M. to 7:00 P.M., Monday through Saturday. No construction shall be permitted on Sundays and federal

holidays (CEC 2024e). The project has proposed that construction activities would occur during the daytime hours between 7:00 A.M. and 5:00 P.M., with potential adjustments in the summer months. Hours of construction may need to be extended earlier or later, particularly for transporting oversized loads (FWPA TN#248290-1).

Construction activities would take approximately 28 months to complete and would include: grading, access road construction, turbine components transportation, laydown area clearance, turbine foundation construction, assembly and erection of turbines, substation and operation and maintenance (O&M) buildings construction, and underground and overhead collection system installation (FWPA TN#248290-1, and FWPA TN#248288-15, Section 3.13.3.2). Rock blasting and the use of helicopters may be necessary in some areas during construction activities. Pile driving would not be used during construction (FWPA TN#248290-1).

Construction equipment typically produces noise levels between 80 and 85 dBA at 50 feet. As mentioned above, R-4 is approximately 5,000 feet away from the nearest turbine. At R-4, the loudest construction activities (producing 85 dBA at 50 feet) would result in a noise level of 45 dBA L_{eq}. This would increase the ambient noise levels at R-4 by 3 dBA. Since this is less than 10 dBA, it would have a less-than-significant impact. Moreover, the loudest construction activities would be infrequent and of short duration.

Construction of the substation and O&M building would occur approximately 1.5 miles away from the nearest residence (R-4) (FWPA TN#248290-1). At R-4, the noise level from the construction of the substation and O&M building is expected to be between 36 and 41 dBA L_{eq}, which would not exceed the ambient noise level.

The nearest residence to roadway construction activities, represented by monitoring location LT-2, is 580 feet away. At LT-2, the loudest roadway construction activities would result in 64 dBA L_{eq}. This would result in an increase of approximately 26 dBA over the daytime ambient noise level at LT-2. However, the roadway construction would be of short duration and in specific locations as the work progresses. Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than several days. To minimize any potential impacts to noise-sensitive receptors, Condition of Certification (COC) **NOISE-6** limits construction of linear facilities to daytime hours. Therefore, installation of the linear facilities would not result in a significant impact.

Helicopters would be used during construction, primarily for stringing overhead collector lines and transmission connection lines. Helicopter overflights could produce noise levels of approximately 100 dBA at 100 feet (FWPA TN#248290-1). Helicopter flight paths during construction are expected to be more than 4,000 feet away from the nearest residences. At the nearest residences to flight paths, a helicopter could generate 68 dBA L_{eq}—approximately 26 dBA L_{eq} above the average daytime ambient noise level at the project's sensitive receptors. To address this, the applicant has proposed mitigation measures, including minimizing helicopter use as much as possible and prohibiting nighttime helicopter use to reduce the potential for sleep interference

among nearby residences (FWPA TN#248290-1). Moreover, the use of helicopters during construction would be infrequent and of short duration. COC **NOISE-6** limits helicopter operation to daytime hours.

Rock blasting may be required for excavation. The applicant states that if blasting were to occur, it would be guided by a detailed blasting plan (FWPA TN#248290-1). The plan would include outlining the anticipated locations for blasting, defining specific times and permissible distances for the use of explosives, and ensuring compliance with all relevant federal, state, and local regulations to reduce environmental impacts, (FWPA TN#248290-1). Blasting that lasts less than 20 seconds can produce noise levels approximately 94 dBA at 50 feet. Blasting can occur between one and ten times per day (FWPA TN#248288-15, Section 3.13.3.2). The closest residence to the potential blasting site, R-4, is approximately 5,000 feet away. At the nearest residence to the potential blasting site, blasting would generate approximately 54 dBA L_{eq}—12 dBA L_{eq} above the ambient noise level at R-4. However, the blasting activities would occur on an infrequent basis for short durations.

Furthermore, to address additional noise impacts that might be perceived noisy by the community, staff proposes COCs **NOISE-1** through **NOISE-3**, **NOISE-5**, and **NOISE-6**. These conditions would provide the public with notification of construction, and noise complaint and redress process (**NOISE-1** and **NOISE-2**), would require construction workers and employees noise protection (**NOISE-3** and **NOISE-5**), and would place restriction on construction activities (**NOISE-6**).

With implementation of COCs **NOISE-1** through **NOISE-3**, **NOISE-5** and **NOISE-6**, project construction activities would not result in generation of a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies and would not create a significant adverse noise impact.

Operation

Less Than Significant Impact with Mitigation. The proposed project and its linear facilities would consist of up to 48 wind turbines, collection lines, a substation, a switchyard, an O&M building, and access roads (FWPA TN#251663). Wind turbine operations and maintenance activities would be the primary sources of noise. The turbine's noise level is approximately 56 dBA, at the base of the turbine. This results in 40 dBA at R-4. R-4, and therefore, the operational noise levels would not exceed the daytime and nighttime ambient noise level of 42 dBA at this location, assuming all of the turbines are operational 24-hours per day. In addition, operational noise levels would be below the County's daytime and nighttime noise limit standards for new projects.

Each turbine would be serviced twice a year and would require the use of a large crane. This equipment can produce noise levels of approximately 85 dBA at 50 feet. At R-4, the noise level from crane operations would be 45 dBA L_{eq}, which would be below the

county's noise limit standard. However, the operation of crane would increase the ambient noise levels by 3 dBA. A 3-dBA increase would be noticeable but would not be distinct. This impact would be less than significant.

Furthermore, staff proposes COC **NOISE-4** to ensure the project would not distinctly increase the ambient noise level at R-4 and would comply with the county's noise thresholds. **NOISE-4** would ensure measurement and verification that operational noise performance criteria are met at the project's noise sensitive receptors.

With implementation of COCs **NOISE-4** project operations would not result in generation of a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies and would not create a significant adverse noise impact.

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction

Less Than Significant Impact. The primary source of vibration during the construction process would be blasting activities at the proposed locations of the project's turbines. This analysis relies on the vibration thresholds identified by Caltrans to determine the significance of vibration impacts related to adverse human reactions. The threshold of human response begins at a PPV of 0.16 in/sec. Caltrans characterizes this as a "distinctly perceptible" event (Caltrans 2013). A level of 0.20 in/sec has been found to be annoying to people in buildings and can pose a risk of architectural damage to buildings.

The worst-case blasting activity can cause a groundborne vibration of 0.098 in/sec at sensitive structures 4,000 feet away (FWPA TN#248290-1, and FWPA TN#250569). As mentioned earlier, the nearest structure is the residence at R-4, which is 5,000 feet away from the nearest turbine location. The vibration intensity of 0.098 in/sec at 4,000 feet away is lower than the threshold of human response, or 0.16 in/sec. Therefore, vibration impacts from blasting are expected to be less than significant.

Operation

Less Than Significant Impact. The wind turbines are the only source of groundborne vibration associated with project operations. These wind turbines would be well-balanced, they are designed to produce very low vibration levels (less than the threshold of human response) throughout the life of a project. In most cases, even when there is an imbalance, they could contribute to ground vibration levels only in the vicinity of the equipment and would be dampened within a short distance.

The project would implement a Supervisory Control and Data Acquisition monitoring system and Remote Operation Control Center to monitor the wind turbines'

performance. The monitoring system and control center would be able to monitor and identify any vibration anomalies from turbines. For further discussion see **Facility Reliability**.

c. For a project located within the vicinity of a private airstrip or 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?

Construction and Operation

Less Than Significant Impact. The nearest airport to the project site is the Fall River Mills Airport, located approximately 21 miles northeast of the nearest project site boundary. The airport is too far from the project site to result in exposure of people residing or working in the project area to excessive noise levels.

5.9.2.3 Cumulative Impacts

None.

5.9.3 Applicable LORS and Project Conformance

Table 5.9-1 staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.9-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Occupational Health and Safety Act (OSHA)	**Yes**. COC **NOISE-3** and **NOISE-5**
State	
Cal-OSHA	**Yes**. COC **NOISE-3** and **NOISE-5**
Local	
Shasta County General Plan Noise Element	**Yes**. COC **NOISE-1** through **NOISE-6**

5.9.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of certification, the project would have a less than significant impact related to noise and vibration and would conform with applicable LORS. Staff recommends adopting the conditions of certification as detailed in subsection "5.9.5 Proposed Conditions of Certification" below.

5.9.5 Proposed Conditions of Certification

NOISE-1 Prior to the start of ground disturbance, the project owner shall notify residences within 1.5 miles of the nearest turbine to each residence, and residences within one-half mile of the linear facilities, by mail, or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction, and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This or a similarly effective telephone number shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: At least 15 days prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site and shall provide that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints.[2] The project owner or its authorized agent shall:

- use the Noise Complaint Resolution Form (shown below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to the noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise in the complaint;
- if the noise is project related, take all feasible measures to reduce the source of the noise; and
- submit the Noise Complaint Resolution Form to the CPM documenting the complaint and actions taken. The form shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant that states that the noise problem has been resolved to the complainant's satisfaction.

2 A project-related noise complaint is a complaint about noise that is caused by the project as opposed to another source and may constitute a violation by the project of any noise condition of certification, which is documented by an individual or entity affected by such noise.

Verification: Within five days of receiving a noise complaint, the project owner shall file with the CPM the Noise Complaint Resolution Form, that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within three business days, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

EMPLOYEE NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during construction in accordance with Title 8, California Code of Regulations, Sections 5095-5099, and Title 29, Code of Federal Regulations, Section 1910.95.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

OPERATIONAL NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project at R-4 will not cause noise levels due to power plant operation to exceed 42 dBA L_{eq} during the daytime and the nighttime hours.

No new pure-tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

When the project first achieves a sustained output of 85 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at R-4. This survey during power plant operation shall also include measurement of one-third octave band sound pressure levels at the above location to ensure that no new pure-tone noise components have been introduced.

If the results from the noise survey indicate that the power plant noise levels (L_{eq}) at the affected receptors exceed the above value for any given hour during the survey, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

If the results from these noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output that produces the highest noise level. Within 30 days after

completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following the project's attainment of a sustained output that produces the highest noise level, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas within the power plant.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, Sections 5095-5099 and Title 29, Code of Federal Regulations, Section 1910.95(g)(3). The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures to be employed in order to comply with the above regulations.

Verification: Within 30 days after completing each survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to Cal-OSHA upon request from Cal-OSHA.

CONSTRUCTION NOISE RESTRICTIONS

NOISE-6 Heavy equipment operation and noisy[3] construction work relating to any project features, including linear facilities, helicopter operation, and rock blasting, shall be restricted to the times delineated below:

Mondays through Saturdays and designated holidays: 7:00 A.M. to 7:00 P.M.

Sundays and Federal holidays: Construction not allowed

Construction work, including helicopter overflight, shall be performed in a manner to ensure excessive noise (noise that draws a project-related complaint) is prohibited and the potential for noise complaints is reduced as much as practicable. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers and other state-required noise attenuation devices. Haul

3 "Noisy" means noise that has the potential to cause project-related noise complaints (for the definition of "project-related noise complaint", see the footnote in condition of certification NOISE-2)

trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use (jake braking) shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Fountain Wind Project (23-OPT-01)
NOISE COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date complaint received: _____ Time complaint received: _____
Nature of noise complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted: _____
Initial noise level at the base of the turbine tower: _____dBA Date: _____ Initial noise level at complainant's property: _____dBA Date: _____ Final noise level at the base of the turbine tower: _____dBA Date: _____ Final noise level at complainant's property: _____dBA Date: _____
Description of corrective measures taken: Complainant's signature: _____ Date: _____
Date installation completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct: Plant Manager's Signature: _____

5.9.6 References

Caltrans 2013 – California Department of Transportation (Caltrans). Technical Noise Supplement to the Caltrans Traffic Noise Analysis Protocol, A Guide for Measuring, Modeling, and Abating Highway Operation and Construction Noise Impacts, Division of Environmental Analysis, Environmental Engineering, September 2013. Report No. CT-HWANP-RT-13069.25.3. Accessed on January 11, 2024. Available online at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/traffic-noise-protocol-april-2020-a11y.pdf

CEC 2024e – California Energy Commission (TN 254432). ROC with Shasta County re: Noise, dated February 13, 2024. Accessed on January 11, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta 2004 – Noise Element of Shasta County's General plan. Accessed on January 11, 2024. Available online at: https://www.shastacounty.gov/planning/page/general-plan

FWPA – Fountain Wind Project Application (248288-15) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248290-1). Noise Report, dated January 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250569). NOI-01 Updated Noise Analysis, dated June 9, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

5.10 Public Health

The purpose of this Public Health analysis is to determine if toxic emissions from the proposed project would have the potential to cause significant adverse public health impacts or violate standards for public health protection in the project area.

The toxic air contaminants addressed in this analysis are pollutants for which there are no specific ambient air quality standards. The Air Quality analysis separately addresses the pollutants for which there are such ambient air quality standards, known as criteria air pollutants. See **Section 5.7, Hazards, Hazardous Materials, and Wildfire**, and **Section 5.9, Noise and Vibration**, for additional analyses of human health effects.

5.10.1 Environmental Setting

Existing Conditions

Toxic Air Contaminants

California Health and Safety Code, section 39655, defines a toxic air contaminant (TAC) as "an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." In addition, substances which have been listed as hazardous air pollutants (HAPs) pursuant to 42 U.S.C. section 7412 are included as TACs under the state law pursuant to Health and Safety Code, section 39657 (b). CARB formally identified federal HAPs as TACs in California Code of Regulations, Title 17, section 93001 (OEHHA 2024).

TACs, or air toxics, are different from criteria pollutants such as ground-level ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Criteria air pollutants are regulated using NAAQS and CAAQS, as noted above. However, there are no ambient standards for most TACs, therefore, site-specific health risk assessments may need to be conducted to evaluate whether risks of exposure to TACs create an adverse impact. Specific TACs have known acute, chronic, and cancer health impacts. CARB has identified TACs in California Code of Regulations, Title 17, sections 93000 and 93001. The nearly 200 regulated TACs include asbestos, organic, and inorganic chemical compounds and compound categories, diesel exhaust, and certain metals. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act of 1987 (Health and Saf. Code, §44300 et seq.) apply to facilities that emit these listed TACs above regulated threshold quantities.

Health Effects of TACs

The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. Exposure to TACs can cause serious adverse human health effects, known as injury or illness, including cancer and birth defects. Numerous other health effects also have been linked to exposure to TACs, including heart disease,

Sudden Infant Death Syndrome, respiratory infections in children, lung cancer, and breast cancer (OEHHA 2015; OEHHA 2024).

The primary on-site TAC emission sources for the proposed project would be diesel engines, including engines powering the vehicles and equipment during construction and any diesel-powered backup generators. Diesel exhaust is a complex mixture of gases and fine particles including over 40 substances listed by the U.S. EPA as HAPs and by CARB as TACs. The solid material in diesel exhaust is known as DPM (CARB 2024).

DPM has been the accepted surrogate for whole diesel exhaust since the late 1990's. CARB identified DPM as the surrogate compound for whole diesel exhaust in its Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant staff report in April 1998 (Appendix III, Part A, Exposure Assessment) (CARB 1998). DPM is primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust deserves attention mainly because of its ability to induce serious noncancerous effects and its status as a likely human carcinogen. Diesel exhaust is also characterized by ARB as "particulate matter from diesel-fueled engines." The impacts from human exposure would include both short- and long-term health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Effects from long-term exposure can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer. Diesel exhaust is listed by the U.S. EPA as "likely to be carcinogenic to humans" (U.S. EPA 2002).

Naturally Occurring Asbestos

Naturally occurring asbestos may be present at sites with certain geologic conditions. This health hazard may occur at a project site in a geographic ultramafic rock unit area or an area where naturally occurring asbestos, serpentine, or ultramafic rocks are determined to be present. Based upon review of the US Geological Survey map detailing natural occurrence of asbestos in California, naturally occurring asbestos is not expected to be present at the project site (Van Gosen and Clinkenbeard 2011).

Valley Fever

Soils in some areas of California host the microscopic fungus that causes Valley Fever, known as *Coccidioides immitis*, which lives in the top two to 12 inches of soil in many parts of the state. When soil is disturbed by activities such as digging, driving, or high winds, fungal spores can become airborne and potentially be inhaled. Workers in Shasta County are at a relatively lower risk than in other areas of California. In addition, employers have a legal responsibility to provide workers with protection from health risks, including any risks due to Valley Fever (DIR 2022). The primary ways to reduce the risk of valley fever are to avoid exposure to dusty air or dust storms, prevent dirt or dust from becoming airborne, and, if working at a dusty site is unavoidable, wear respiratory protection with particulate filters rated as N95 or higher (DIR 2022).

Sensitive Receptors

The Shasta County AQMD, Environmental Review Guidelines (2003), define sensitive receptors as: facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors.

The closest sensitive receptors to the project site would be existing residences. The nearest residence to any of the work areas on the project site would be those along Sycamore Road, approximately 1,900 feet from a construction staging area. The closest residence to any of the access roads on the project site would be along Moose Avenue, at a distance of approximately 400 feet. (FWPA TN 248288-5; Shasta County DEIR).

Regulatory

Federal

Federal Clean Air Act

The federal Clean Air Act (CAA), Section 112 (42 U.S.C., § 7412) defines the list of specified Hazardous Air Pollutant (HAP) and requires new sources that emit more than 10 tons per year of any HAP or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology.

HAPs are a variety of substances that pose serious health risks. Direct exposure to HAPs has been shown to cause cancer, reproductive effects or birth defects, damage to the brain and nervous system, and respiratory disorders. Categories of sources that cause HAP emissions are controlled through separate standards under CAA Section 112: National Emission Standards for Hazardous Air Pollutants (NESHAPs). These standards are specifically designed to reduce the potency, persistence, or potential bioaccumulation of HAPs.

Title 40 Code of Federal Regulations Parts 61 and 63 National Emission Standards for Hazardous Air Pollutants. Stationary reciprocating internal combustion engines (RICE), including stationary “spark ignition” engines fired on natural gas, landfill gas, gasoline, or propane, are subject to the RICE NESHAP (40 C.F.R. Part 63, Subpart ZZZZ). This regulation establishes national emission limitations and operating limitations for HAPs, in terms of hydrocarbons and formaldehyde concentrations emitted from stationary RICE. This regulation also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. Emergency stationary RICE may be operated for up to 50 hours per calendar year in non-emergency situations, and the engine and after-treatment control device (if any) must be operated according to the manufacturer's emission-related written instructions (40 C.F.R., § 63.6625).

Asbestos is a HAP regulated under the NESHAP Subpart M (40 C.F.R., § 61.140). The asbestos NESHAP is intended to provide protection from the release of asbestos fibers

during activities involving the handling of asbestos. CAA air toxics regulations specify work practices for asbestos to be followed during demolitions and renovations (40 C.F.R., § 61.145). The regulations require a thorough inspection of the area where the demolition or renovation would occur and advance notification of the appropriate delegated entity. Work practice standards that control asbestos emissions must be implemented, such as removing all asbestos-containing materials (ACM), adequately wetting all regulated ACM, and sealing ACM in leak-tight containers and disposing of the asbestos-containing waste material as expediently as practicable.

State

Sections 39650 et seq. of the California State Health and Safety Code. These sections mandated the California Air Resources Board (CARB) and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also required that the New Source Review rule for the permitting of new and modified stationary sources of air pollution in each air pollution control district include regulations that require procedures for controlling the emission of toxic air contaminants.

Section 41700 of the California State Health and Safety Code. This section states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

Air Toxic "Hot Spots" Information and Assessment Act of 1987. The Air Toxic "Hot Spots" Information and Assessment Act of 1987 (Assembly Bill 2588 [Connelly, Statutes of 1987], and codified as Health and Safety Code, § 44300 and the following), identifies TAC hot spots where emissions from specific stationary sources may expose individuals to an elevated risk of adverse health effects, particularly cancer or reproductive harm. Many TACs are also classified as HAPs. AB 2588 requires that a business or other establishment identified as a significant stationary source of toxic emissions provide the affected population with information about the health risks posed by their emissions.

Airborne Toxic Control Measures (ATCM)

Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines, Emergency Standby Diesel-Fueled Compression Ignition Engines. Statewide regulations govern the use of and emissions performance standards for emergency standby diesel-fueled engines, including those of the project. As defined in regulation (Cal. Code Regs., tit. 17, §93115.4(a)(29)), an emergency standby engine is, among other possible use, one that provides electrical power during an emergency use and is not the source of primary power at the facility and is not operated to supply power to the electric grid. The corresponding ATCM (Cal. Code Regs., tit. 17, § 93115.6) restricts each emergency standby engine to operate no more than 50 hours

per year for maintenance and testing purposes. The ATCM establishes no limit on engine operation for emergency use or for emission testing to show compliance with the ATCM's standards.

Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations. CARB has adopted the Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations to minimize the generation of asbestos from earth disturbance or construction activities (Cal. Code Regs., tit.17 § 93105). The Asbestos ATCM applies to any project that would include sites to be disturbed in a geographic ultramafic rock unit area or an area where naturally occurring asbestos, serpentine, or ultramafic rocks are determined to be present. Based upon review of the US Geological Survey map detailing natural occurrence of asbestos in California, naturally occurring asbestos is not expected to be present at the project site (Van Gosen and Clinkenbeard 2011).

Local

Shasta County General Plan. The Shasta County General Plan describes the need to balance planning objectives when making land use-related decisions. In Chapter 3 of the General Plan, the County articulates a need to accommodate and encourage growth balanced with preserving the quality of life, including public health, safety, and welfare. The Public Safety elements in the General Plan are concerned with aspects of the County's natural and man-made environment as it poses potential threats to human life or property. The treatment of public health appears in different elements of the General Plan, including air quality, noise, and hazardous materials.

The Air Quality Element of the Shasta County General Plan includes the following policies designed to safeguard human health by protecting and improving the County's air quality (Shasta County 2004):

- Policy AQ-1c: The County will work with the AQMD to develop standards to minimize exposure of the public to toxic air pollutant emissions and noxious odors from industrial, manufacturing, and processing facilities.
- Policy AQ-1e: The County shall require new air pollution point sources such as, but not limited to, industrial, manufacturing, and processing facilities to be located an adequate distance from residential areas and other sensitive receptors.

Shasta County Environmental Health Division. The Shasta County, Department of Resource Management includes the Environmental Health Division (EHD) to administer permits related to building and development needs. Examples of facilities that require permits from the EHD are water wells, underground storage tanks, hazardous materials handling, and onsite wastewater treatment systems in the County.

Shasta County AQMD Rules and Regulations. The Shasta County AQMD enforces the following rules that may be applicable to the Project to limit the generation of air pollutants in Shasta County:

- Rule 2:3, Toxics New Source Review for Complying with Federal Clean Air Act Section 112(g). This rule requires installation of the best available control technology for toxics at facilities that qualify as a major source of HAPs. Facilities having the potential to emit considering controls, in the aggregate, 10 tons per year or more of hazardous air pollutants or 25 tons per year or more of any combination of hazardous air pollutants would qualify as a major source of HAPs.
- Rule 3:22, Asbestos ATCM: Asbestos-Containing Serpentine. This rule includes provisions for the use, sale and supply of serpentine material that may be usable as surfacing. No asbestos-containing serpentine material may be applied in the maintenance of existing roads or to new road surfaces.

Cumulative

The proposed project would be in Shasta County, within the Sacramento Valley Air Basin. Past, present, and future development projects contribute to the region's TAC levels on a cumulative basis. Although the region experiences the existing conditions of acute, chronic, and cancer health risks due to TACs attributable to the region's development history, the project site is isolated and unlikely to be affected by the region's timber operations or other industrial sources of TACs, which are more than three miles to the east of the project site, near Burney.

The Cumulative Project Scenario and a list of cumulative projects appears in **Appendix 1, Table 1-2**. Past, present, and reasonably foreseeable probable future public health impacts could be attributable to each of the cumulative projects, especially those that involve construction activities or O&M activities with substantial sources of air pollutants.

Each of the projects in the cumulative project scenario could result in some level of contribution to public health impacts, although the individual contribution of each project would be minimized if the project complies with applicable health-protective laws, ordinances, rules and regulations, and standards, as described in the "Regulatory Setting" (subsection 5.10.1).

5.10.2 Environmental Impacts

PUBLIC HEALTH	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution				

PUBLIC HEALTH	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
control district may be relied upon to make the following determination.				
a. Would the project expose sensitive receptors to substantial pollutant concentrations or result in other public health impacts?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, air quality and staff additions.

5.10.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

Staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions of contaminant concentrations and exposure.

Emissions of TACs are evaluated for potential short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. The significance of project health impacts is determined separately for each of these categories of health effects.

Staff relies upon the expertise of the California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA) to identify contaminants that are known to the state to cause cancer or other noncancer toxicological endpoints and to calculate the toxicity and cancer potency factors of these contaminants. Staff also relies upon the expertise of the California Air Resources Board and the local air districts to conduct ambient air monitoring of toxic air contaminants and the state Department of Public Health to conduct epidemiological investigations into the impacts of pollutants on communities. It is within the purview and expertise of those agencies to establish the facts relevant to this analysis. Typically, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. This approach increases the likelihood that the actual risks from the new source of emissions will be much lower than the risks as estimated by the screening level assessment. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those conditions in the study. Such conditions include:

- using the highest levels of pollutants that could be emitted from the source;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer model which predicts the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
- assuming that an individual's exposure to cancer-causing agents occurs continuously for 70 years; and
- using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

Thresholds of Significance

Acute and Chronic Noncancer Health Effects

Staff assesses the significance of noncancer health effects by calculating a "hazard index." A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one (1.0) signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance that has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels. Under these conditions, health protection from the project is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant noncancer project-related public health impacts. The Shasta County AQMD recommends evaluating the potential for a project to expose people to acutely hazardous air pollutants (AQMD 2003a) and requires emissions controls to ensure that new sources to ensure that the total hazard index is less than or equal to one (AQMD 2003b). Staff considers chronic or acute noncancer health impacts to be significant if the total hazard index exceeds 1.0.

Cancer Risks

Staff relies upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a cancer risk significance level. The regulations adopted under Proposition 65 establish thresholds of exposure to carcinogenic substances above which exposure warnings are required. Title 22, California Code of Regulations, section 12703(b) states that "the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This level of risk is equivalent to a cancer risk of 10 in one million (10×10^{-6}). An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing

substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65. The significant risk level of 10 in one million is consistent with the level of significance recommended by the Shasta County AQMD (AQMD 2003a, AQMD 2003b).

The initial risk analysis for a project is typically performed at a screening level which is designed to overstate actual risks so that staff is confident that that risk and hazard are not underestimated. Staff's analysis also addresses potential impacts on all members of the population including the young, the elderly, people with existing medical conditions that may make them more sensitive to the adverse effects of toxic air contaminants and any minority or low-income populations that are likely to be disproportionately affected by impacts (because these populations often have a greater incidence of pre-existing medical conditions). Staff utilizes the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of airborne toxics. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of 10 in one million, staff would require appropriate measures to reduce the risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than 10 in one million, staff would deem such risk to be significant, and would not recommend project approval.

5.10.2.2 Direct and Indirect Impacts

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determination.

a. Would the project expose sensitive receptors to substantial pollutant concentrations or result in other public health impact?

Construction

Less Than Significant Impact. Potential risks to public health during construction would be associated with exposure to particulate matter emissions from diesel-fueled engines and fugitive dust that may pose a risk of valley fever to individuals near the site. The overall particulate matter impact during construction is primarily due to geologic material or dust made airborne by ground disturbance or wind erosion, and a small fraction (less than one percent) of the total particulate matter impact includes exhaust from the diesel-fueled equipment.

Analysis of criteria air pollutant impacts from the operation of construction equipment and fugitive dust in the form of particulate matter appears in **Section 5.1, Air Quality**.

Health Risks of Toxic Air Contaminants

Use of typical construction equipment results in toxic emissions from the diesel-fueled engines. Diesel emissions occur from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Air quality impact analysis of diesel exhaust normally focuses on the criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides. The public health impact focuses on the complex mixture of gases and fine particles in diesel exhaust. These particulate emissions are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances.

Exposure to DPM may cause both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Health values approved by OEHHA in conjunction with CARB include a chronic inhalation reference exposure level for DPM of 5 $\mu g/m^3$, and a cancer inhalation unit risk factor of 3×10^{-4} $(\mu g/m3)^{-1}$ (OEHHA 2023). DPM has no recommended value for an acute reference exposure level, since insufficient data supports an acute value.

Construction of the proposed project, including development of the access roads and installation of the generation facility, would take place over a period of 24 to 28 months (FWPA TN 254794; Project Description, March 4, 2024). As noted earlier, assessment of chronic (long-term) health effects relies on use of potency factors based on lifetime studies or long-term exposure to toxic substances. Accordingly, risk characterization for facilities with large emission footprints (e.g., refineries, ports, or rail yards, etc.) normally consider population-wide impacts over a lifetime (70 years) or a 30-year period of residential exposure (OEHHA 2015).

Section 5.1, Air Quality presents the emissions from construction activities including fugitive dust and diesel exhaust. Emissions of DPM represent less than one percent of the total particulate matter (PM10) emissions. Dispersion modeling developed by the applicant presented the maximum ground-level concentration impact of 0.0036 $\mu g/m^3$ PM10 (annual average) during construction along the site boundary (FWPA TN 251208 and 251364).

Staff reviewed the applicant's dispersion modeling and conducted an independent staff analysis to reflect the site boundary as in the current Project Description (FWPA TN 254794) and to focus on the on-site DPM emissions, which would be a subset of the total PM10 impact. Staff determined that the property boundary could experience up to an annual average DPM concentration of 0.0066 $\mu g/m^3$. At the closest residence to any of the project areas of disturbance, the annual average DPM concentration would be

less than 0.0036 µg/m^3. This DPM concentration represents a screening-level upper boundary for evaluation of possible offsite health risks.

Staff evaluated construction-phase health risk for an individual resident at the site boundary with exposure at the maximum ground-level concentration. Cancer risks for construction-related DPM emissions are based on a worst-case two-year exposure period that starts in the third trimester of pregnancy, as specified by OEHHA risk assessment methods guidance for short-term projects (OEHHA 2015). Staff calculated risk levels for this screening analysis by using the CARB Air Dispersion Modeling and Risk Tool, which is part of the Hotspots Analysis and Reporting Program (HARP2) suite of software (version 22118).

For a residential receptor exposed to the DPM concentration of 0.0036 µg/m^3 for the construction period, the risk assessment result for incremental cancer risk would equal 1.2 in one million (1.2 x 10^{-6}). This impact would not exceed the significance threshold (10 in one million). The chronic noncancer hazard index at the modeled concentration would be 0.00072, which is below the significance threshold of 1.0. The potential adverse health effects of DPM during construction would not warrant any additional analysis.

Mitigation measures identified in **Section 5.1, Air Quality** would reduce the maximum modeled PM10 impact and DPM emissions. Measures including extensive fugitive dust control and use of higher-tier engines in construction equipment would achieve substantial PM10 and DPM reductions, respectively. (See **Section 5.1, Air Quality** for staff's recommendations to control particulate matter.) While mitigation is identified for the analysis of Air Quality impacts, no mitigation would be necessary to ensure that construction activities do not expose sensitive receptors to substantial pollutant concentrations of DPM. This impact would be less than significant.

Valley Fever

Construction and operation of the proposed project would pose a risk of valley fever to workers, operators, and the general public who could inhale the airborne spores of the fungus of the *Coccidioides* species, which is the causative agent of valley fever. It is the growth of these inhaled spores in the lungs that constitutes valley fever whose symptoms could be mild with influenza-like symptoms and rashes, or life-threatening from pneumonia, lung nodules, and meningitis. The risk of serious symptoms is highest for individuals with weakened immune systems such as pregnant women, and those with several types of pre-existing diseases.

Since the fungal spores at issue are disseminated while attached to dust, and it is not possible to prevent all risks of infection in the project area or other parts of the U.S. where the fungus occurs naturally, staff recommends dust control measures. This infection risk is minimized through measures that require soil disturbance and dust generation work to be performed in a manner that limits and avoids dust generation to the extent reasonably possible. The Air Quality analysis separately seeks to minimize

unnecessary airborne dust through recommended Conditions of Certification **AQ-SC1** to **AQ-SC4**, which would minimize dust generation in the construction phase. In addition, Condition of Certification **AQ-SC3** would limit vehicle speeds and would require dust and erosion control procedures to be developed and implemented during the operational phase to minimize dust and infection risk in the area. Also, controls incorporated as Conditions of Certification for the Water Resources analysis would require managing drainage and controlling erosion through various best management practices (BMP). The BMPs would include maintaining soil in a wet condition during grading, and using soil covers or binding agents outside of periods of disturbance including project operations. The recommended Air Quality and Water Resources Conditions of Certification would adequately minimize valley fever risk in the project and other areas where the *Coccidioides* fungus occurs naturally.

Operation

Less Than Significant Impact. Operation and maintenance of the proposed project would involve occupation and use of the O&M building (7,000 square-feet) that would be served by new or existing domestic wells or a water storage tank and an on-site septic system in accordance with the rules and regulations of the Shasta County Department of Resource Management's EHD (FWPA 2023; TN 254794). The design and operation of water supply and sanitary systems in a manner consistent with EHD requirements would minimize the possibility of adverse human health effects. (See Condition of Certification **WATER-7** in **Section 5.16, Water Resources**.)

The proposed project would also include an emergency generator that would run on compressed natural gas or propane. The Shasta County AQMD prepared a health risk assessment for this stationary source, including TAC components that would be products of combustion, and calculated risk levels using the CARB's HARP2 Air Dispersion Modeling and Risk Tool. The annual use of this engine is not expected to exceed 100 hours per year (FWPA TN 250273, AQMD 2024), and the overall emissions from this equipment would be minor. **Table 5.10-1** summarizes the results of the health risk assessment for the proposed propane emergency backup generator.

TABLE 5.10-1 HEALTH RISK ASSESSMENT RESULTS

Receptor Type	Cancer Risk Impact (in one million)	Chronic Non-Cancer Hazard Index (HI)	Acute Non-Cancer Hazard Index (HI)
Residential, maximally exposed individual resident	0.000155	0.00000212	0.00546
Thresholds of Significance	**10**	**1.0**	**1.0**

Source: AQMD 2024.

The proposed use of natural gas or propane and the low annual levels of operation of this backup device ensure that no notable quantity of HAPs or TACs would occur. The O&M activities would not expose sensitive receptors to substantial pollutant concentrations, and this impact would be less than significant.

5.10.2.3 Cumulative Impacts

Less Than Significant Impact. The conclusion for cumulative impacts to public health relies on the proposed project's individual impact being well below the thresholds for a cumulatively considerable incremental contribution to the cumulative impact. Because the project would not expose sensitive receptors to pollutant concentrations that could be cumulatively considerable, the project's potential to contribute to a cumulative public health impact would be less than significant with mitigation incorporated.

5.10.3 Applicable LORS and Project Conformance

Table 5.10-2 includes staff's determination of conformance with applicable local, state and federal LORS, including any proposed Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that the proposed project would be consistent with all applicable LORS.

TABLE 5.10-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Clean Air Act	
NESHAPs under CAA, section 112 (42 U.S.C., § 7412), 40 CFR Part 63, NESHAP Subpart ZZZZ	**Yes.** Applies to proposed project's propane-fueled stationary emergency generator engine. Emergency stationary RICE included with the proposed project would be subject to operating requirements in this federal regulation. With the engine certified to comply with NSPS Subpart JJJJ, the emission limitations in RICE NESHAP Subpart ZZZZ would not apply. See Conditions of Certification **AQ-SC7** through **AQ-SC9** recommended in **Section 5.1, Air Quality**.
State	
California Health and Safety Code	
Air Toxics Hot Spots Program	**Not applicable.** The proposed project would not include sources that emit listed TACs above regulated threshold quantities.
ATCM – Compression Ignition Engines	**Not applicable.** The proposed project would not include diesel-fueled stationary engines.
ATCM – Asbestos ATCM	**Not Applicable.** The proposed project not in an area likely to contain naturally occurring asbestos.
Local	
Shasta County AQMD	
Rule 2:3, Toxics New Source Review.	**Not Applicable.** The proposed project would not be a major source of HAPs.
Rule 3:22, Asbestos ATCM: Asbestos-Containing Serpentine	**Not Applicable.** Asbestos-containing serpentine material would not be used by the proposed project.

5.10.4 Conclusions and Recommendations

Staff analyzed the potential public health risks from the toxic air pollutants associated with construction and operation of the proposed project and does not expect that there would be any significant adverse cancer or short- or long-term noncancer health effects

to any members of the public. The toxic air contaminants considered in this analysis are pollutants for which there are no established ambient air quality standards.

This analysis of potential health impacts from the proposed project uses a conservative health protective methodology that accounts for impacts to the most sensitive individuals in a given population. According to the results of health risk estimates described here, emissions from the proposed project would not expose sensitive receptors to substantial pollutant concentrations or contribute significantly to any increase in mortality or increase in serious illness for any individual in the project area.

As discussed above, the project would have a less than significant impact related to public health and would conform with applicable LORS.

5.10.5 Proposed Conditions of Certification

There are no proposed conditions of certification for public health.

5.10.6 References

AQMD 2003a – Shasta County Air Quality Management District (AQMD). Environmental Review Guidelines, Procedures for Implementation the California Environmental Quality Act. November 2003. Accessed on: January 11, 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/air_quality/page/2415/scaqmd-ceqa-guidelines.pdf

AQMD 2003b – Shasta County Air Quality Management District (AQMD). Protocol for Review Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act. November 2003. Accessed on: January 11, 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/air_quality/page/2415/scaqmd-ceqa-land-use-protocol.pdf

AQMD 2024 – Shasta County Air Quality Management District (AQMD). Input on the Opt-in Application for Certification of the Fountain Wind Project, dated February 23, 2024. (Also cited as FWPA TN 254693). Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CARB 1998 – California Air Resources Board (ARB). 1998. Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. Appendix III, Part A, Exposure Assessment. June 1998. Accessed March 15, 2024. Accessed online at: https://ww3.arb.ca.gov/toxics/dieseltac/part_a.pdf

CARB 2024 – California Air Resources Board (CARB). Accessed April 2023. Overview: Diesel Exhaust & Health. Accessed on March 15, 2024. Accessed online at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health

DIR 2022 – Department of Industrial Relations (DIR). Protection from Valley Fever; Updated: April 2022. Accessed on January 11, 2024. Accessed online at: https://www.dir.ca.gov/dosh/valley-fever-home.html

Shasta County 2004 – Shasta County (Shasta County). Shasta County General Plan. Amended through September 2004. Accessed on: January 10, 2024. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan

OEHHA 2015 – Office of Environmental Health Hazard Assessment (OEHHA). Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February. Accessed on January 22, 2024. Accessed online at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf

OEHHA 2023 – Office of Environmental Health Hazard Assessment (OEHHA). Consolidated Table of OEHHA / CARB Approved Risk Assessment Health Values. Updated October 6. Accessed on January 22, 2024. Accessed online at: https://ww2.arb.ca.gov/resources/documents/consolidated-table-oehha-carb-approved-risk-assessment-health-values

OEHHA 2024 – Office of Environmental Health Hazard Assessment (OEHHA). Toxic Air Contaminants. Accessed on January 22, 2024. Accessed online at: https://oehha.ca.gov/air/toxic-air-contaminants

Van Gosen and Clinkenbeard 2011 – Van Gosen, B.S., and Clinkenbeard, J.P. (Van Gosen and Clinkenbeard). Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California: U.S. Geological Survey Open-File Report 2011-1188. Accessed on January 2, 2024. Accessed online at: http://pubs.usgs.gov/of/2011/1188/

U.S. EPA 2002 – United States Environmental Protection Agency (U.S. EPA). Health Assessment Document For Diesel Engine Exhaust. May 2002. Accessed March 15, 2024. Accessed online at: https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=36319&Lab=NCEA

5.11 Socioeconomics

5.11.1 Environmental Setting

This section describes the environmental setting and regulatory background and discusses the impacts associated with the construction and operation of the project with respect to population and housing, public services, and recreation.

Existing Conditions

Population and Housing

The project is proposed in the unincorporated area of Shasta County. Staff considers Shasta County as the study area for population and housing-related impacts and the Redding Metropolitan Statistical Area (MSA), which covers Shasta County, as the setting for labor supply for the project.

The workforce for both the project's construction and operations phases is expected to be derived from Shasta County. The county includes various unincorporated communities, in addition to the cities of Anderson, Redding, and Shasta Lake. Staff considers that the local workers[1] from Shasta County are not likely to temporarily (during construction) or permanently (during operations) move closer to the project. The Applicant has assumed that the number of unemployed workers in the County is sufficient for covering the project's construction workforce, based on the Fountain Wind Project Economic and Public Revenue Impact Study. This assumption is based on the County's overall unemployment rate of 5.9 percent at the time of the study being applied to the construction workforce (FWPA, TN 250915). However, the California Department of Transportation's Shasta County Economic Forecast shows that construction employment trends in Shasta County have increased over the last decade, expanding faster than any other sector in the County. Additionally, it states that as of 2022, the local construction workforce was fully employed and predicts that total construction employment will remain at elevated levels throughout the forecast period (through 2027), but construction firms will struggle to hire and grow (CA DOT 2022).

Population Growth. Table 5.11-1 shows the historical and projected populations for Shasta County as a whole. The county had a population of 182,537 in 2020. The California Department of Finance has projected that Shasta County will have a population of 180,245 in 2040, which is a change of −1.25 percent or −0.6 percent per year.

It is worth noting that the Department of Finance population projection showed a significant drop between 2020 and 2023, with a population estimate of 179,455 for

1 Workers with a greater commute (i.e., greater than 90-120 minutes from home) would be considered non-local and would tend to seek lodging closer to the project site (temporarily during construction or permanently during operations).

2023. As a result, between 2023 and 2040, there would be an estimated 0.4 percent increase (CA DOF 2023a, b).

TABLE 5.11-1 HISTORICAL AND PROJECTED POPULATIONS

Area	2020	2040	Projected Population Change 2020-2040 Number	Projected Population Change 2020-2040 Percent (%)	Projected Population Change 2020-2040 Percent per Year (%)
Shasta County	182,537	180,245	−2,292	−1.25	−.06

Sources: CA DOF 2023a.

Housing. Table 5.11-2 presents housing supply data for the cities within proximity of the project site, the unincorporated county, plus Shasta County as a whole. Year 2023 housing estimates indicate 6,907 vacant housing units within Shasta County, representing a vacancy rate of 8.6 percent (CA DOF 2023).

TABLE 5.11-2 HOUSING SUPPLY ESTIMATES IN THE PROJECT AREA

Housing Supply		2023 Total	2023 Vacant
Anderson	Number	4,782	241
	Percent	100	5.0
Redding	Number	40,509	2,467
	Percent	100	6.1
Shasta Lake	Number	4,413	285
	Percent	100	6.5
Balance of County (Unincorporated)	Number	30,507	3,914
	Percent	100	12.8
Shasta County	Number	80,211	6,907
	Percent	100	8.6

Source: CA DOF 2023.

Labor Supply. As of 2022, the local construction workforce in Shasta County was fully employed. The Shasta County Economic Forecast predicts construction employment will remain at elevated levels throughout the forecast period until 2027, and construction firms will struggle to hire and grow (CA DOT 2022). **Table 5.11-3** presents the California Employment Development Department 2020-2030 Occupational Employment Projections for the Fountain Wind Project's construction occupations in the Redding MSA. The projections are estimates of the expected employment for individual occupations. For the year 2030, the total projected employment estimate of the construction occupations within the project's MSA (identified in Table 5.11-3) would be 4,880 workers.

TABLE 5.11-3 PROJECTED EMPLOYMENT GROWTH

Redding MSA (Shasta County)	Year 2020	Year 2030	Percent Change
Carpenters	460	550	19.6
Cement Masons and Concrete Finishers	170	200	17.6
Construction Laborers	880	1,100	25
Electricians	290	360	24.1
First-Line Supervisors of Construction Trades and Extraction Workers	300	350	16.7
Heavy and Tractor-Trailor Truck Drivers	970	1,130	16.5
Operating Engineers and Other Construction Equipment Operators	340	400	17.6
Other Construction and Related Workers	230	260	13
Plumbers, Pipefitters, and Steamfitters	150	190	26.7
Roofers	270	340	25.9
Total	4,060	4,880	20.2

Note: Long-term (10 year) projections are based on annual average employment levels by industry for the base (2020) and target (2030) years. Source: CA EDD 2023.

Public Services

The study area for public services-related impacts is Shasta County. Fire and police protection services are provided to the project site from departments within Shasta County. Park facilities and other public facilities such as libraries are also provided by the County. The project site is within the Mountain Union Elementary, Shasta Union High, and Fall River Joint Unified school district boundaries.

The project site would be located on private property, managed for timber production and harvesting, where public access is currently restricted.

Fire Protection. Fire protection services for the project site are provided by Shasta County Fire in cooperation with CAL FIRE, which includes Shasta County Volunteer Fire Companies (VFC), Shasta County Fire Department (SCFD), and CAL FIRE (Shasta County 2023a). Shasta County has seven Battalions, with Battalions 1 and 2 closest to the project site. Shasta County Fire (not including its contract with CAL FIRE) has three full-time equivalent (FTE) positions, which include a Fire Marshall, an Inspector, and a Parts Storekeeper. Shasta County Fire Department has had difficulty with new recruitment and retention of volunteer firefighters. As a result, they rely on contracted work with CAL FIRE (Shasta County 2023b). CAL FIRE stations are fully staffed and equipped during the nine-month fire season (approximately March through November), including six stations, each with five paid staff and one or two volunteers (CEC 2024g).

Battalion 1 has five Shasta County volunteer fire companies, CAL FIRE Burney Station 14, and CAL FIRE Big Bend Station 19. A total of 25 volunteer firefighters staffed the 5 VFCs in 2022. CAL FIRE Station 14 was fully staffed throughout 2022 (CAL FIRE and SCFD 2022). Battalion 1 has had difficulty in recruitment and retention of volunteers, with an overall declining number of volunteers. Volunteer firefighters from VFCs 10, 11, and 12 in Battalion 1 joined forces to increase the regional level of service to their communities (CAL FIRE and SCFD 2022).

Battalion 2 comprises two Shasta County Fire Department volunteer fire companies in Montgomery Creek and Oak Run, as well as CAL FIRE Buckhorn Station 34, CAL FIRE Diddy Wells Station 74, and CAL FIRE Hillcrest Station 75. The communities located within Battalion 2 have numerous response challenges that affect fire personnel. The challenges include industrial and commercial structures, large power distribution facilities, and varying dynamic fuel and topography types. A total of 12 volunteer firefighters staffed the 2 VFCs in 2022 (CAL FIRE and SCFD 2022).

The nearest fire stations to the project site are Montgomery Creek VFC Station 71, located adjacent to CA-299 in Round Mountain, approximately four miles west of the southwest edge of the project site, and CAL FIRE Hillcrest Station 75, located adjacent to CA-299 in Montgomery Creek, approximately 1.5 miles west of the northwest edge of the project site (Google Maps 2023). In 2022, VFC Station 71 had 8 active volunteers. This station was dispatched 303 times and responded to 294 of those calls. Hillcrest Station 75 responded to 168 calls (CAL FIRE and SCFD 2022). In the case of a structure fire (e.g., industrial wind generation facilities), stations 71 and 30 would respond. In the case of a structure and wildland fire, stations 74, 75, 14, 19, 34, and 35 would respond (CEC 2024g).

Over the previous few years, SCFD and CAL FIRE Shasta-Trinity Unit have seen a diminishing number of training classes and attendance, which has made it difficult to fully provide for the training needs of the local area and region, as well as nationally. The Shasta County fleet comprises 106 fire engines, water tenders, rescue vehicles and related apparatus, and boats. The CAL FIRE fleet includes approximately 150 pieces of fire equipment. Inflation, replacement parts, consistent staffing, and supply chain issues are current challenges to the County in maintaining its fleet. (CAL FIRE and SCFD 2022).

SCFD is responsible for all medical aid incidents outside of incorporated cities and districts within Shasta County. Of the 3,286 medical calls SCFD responded to in 2022, 1,300 were in outlying areas of the county. These areas have the longest responses times, averaging approximately 30 minutes (CAL FIRE and SCFD 2022).

Police Protection. Police protection for Shasta County's rural areas is provided by the Shasta County Sheriff's Department. The Sheriff's Department is budgeted for 107 full-time equivalent employees (FTE) in 2023-2024 (Shasta County 2023b), and the department has a varying number of part-time or per diem employees, community volunteers, police reserves, and chaplains. The Shasta County Sheriff's Office is located at 300 Park Marina Circle in Redding, approximately 30 miles southeast of the project site (Shasta County 2023c). The County Sheriff's Office - Burney substation is approximately 12 miles from the project site and provides law enforcement services to the residents of eastern Shasta County. Services include patrol, K-9, investigations, citizen volunteer patrol, search and rescue, concealed weapons permit processing, abandoned vehicle abatement, and limited animal control. For 2023-2024, the Burney substation is budgeted for 13 FTEs (Shasta County 2023b).

Schools. Shasta County Office of Education oversees 25 school districts throughout approximately 3,800 square miles (Shasta COE 2023). The project site is located within multiple school districts. The majority of the project site is in the Mountain Union Elementary School District and Shasta Union High School District, and the northeast part of the site is in the Fall River Joint Unified School District. The Fall River Joint Unified School District enrolled 1,187 students in the 2022-2023 school year (Ed Data 2023). Mountain Union Elementary School District enrolled 82 students, and Shasta Union High School District enrolled 5,552 students in the 2022-2023 school year (Ed Data 2023).

The nearest public schools to the project site are (Shasta County 2023d; FRJD 2023):

- Montgomery Creek Elementary School, located at 30365 CA-299, Montgomery Creek, approximately 3 miles west of the project site;
- Burney Jr/Sr High School, located at 37571 Mountain View Rd, Burney, approximately 7 miles northeast of the project site;
- Burney Elementary School, located at 37403 Toronto Ave, Burney, approximately 7 miles northeast of the project site.

Parks and Recreation. Shasta County is known for its recreational activities found in the parks, trails, forest areas, creeks and rivers, lakes, and open spaces. Year-round recreation activities include camping and hiking, hunting, fly fishing, and boating. Winter recreation activities include skiing, snowshoeing, and snowmobiling. The major recreation destinations are found in the undeveloped open space and natural areas of national recreation areas, national parks, national forests, wilderness areas and State Parks. McArthur-Burney Falls Memorial State Park is located 13 miles northeast from the proposed project site. The county includes five national forests and national park sites, including Lassen National Forest, Shasta-Trinity National Forest, Whiskeytown National Recreation Area, and Lassen Volcanic National Park (Shasta County 2009). Shasta-Trinity National Forest and Lassen National Forest are found to the north, east, and west of the project, with Lassen National Forest land directly adjacent to the project site southeast of the project boundary.

The county has fewer than 10 rural community parks. Maintenance and operations for these park sites are typically provided by volunteer community organizations and school districts. The county has more recreational opportunities through its regional parks, which include national forests and state parks, as well as smaller sites. These regional parks are owned and operated by various agencies including Shasta County, California State Parks, Bureau of Land Management, U.S. Fish & Wildlife Service, National Park Service, and U.S. Forest Service (Shasta County 2009). These parks include a well-known fly-fishing destination, Hat Creek Regional Park, which is owned and maintained by Shasta County. This park is located 15 miles northeast from the proposed project site.

Other Public Facilities. Public library services are provided by the Shasta County Libraries. The Shasta County Libraries system has three locations—Redding, Burney, and Anderson (Shasta Public Libraries 2023). The Burney library is approximately 6.5 miles northeast of the project site.

Regulatory

Federal

No federal regulations related to Socioeconomics apply to the project.

State

California Education Code, 17620. The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.

California Government Code, Sections 65995-65998. Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

Local

Shasta County Development Impact Fees. The County charges various development impact fees for industrial development. See fee schedule at https://www.shastacoe.org/shasta-county-schools/business-services/developer-fee-services.

Cumulative

Geographic Extent

The geographic scope for the analysis of cumulative impacts on Socioeconomics is Shasta County. This is defined as the cumulative impact area because socioeconomic factors such as public services are provided by local jurisdictions or districts, and available housing is located within Shasta County. Additionally, the local workforce is expected to come from within Shasta County.

Existing Cumulative Conditions

Past development and population growth within Shasta County have impacted the population, housing, and public services within the county. When the population increases because of development, the housing demand, workforce, and public services expand to accommodate the growing population and development needs. As discussed in subsection 5.11.1, population has decreased over the past few years, and is projected to slowly increase until 2040, although not predicted to hit 2020 population levels by 2040. Between the years 2000 and 2023, the total population of Shasta

County decreased 1.7 percent. Between 2023 and 2040, the population is predicted to increase by 0.4 percent (CA DOF 2023a, b).

As discussed in subsection 5.11.1, the construction employment trends have increased and are expected to continue. Despite the overall county's unemployment rate of 5.9 percent, the construction workforce was fully employed as of 2022, and is predicted to remain elevated through at least 2027. Construction and operation of the proposed project in conjunction with the projects described in **Appendix 1, Table 1-2** could result in the potential for impacts to population, housing, and public services in the county. While it is not expected that the operation of the energy projects listed would substantially change the population and housing dynamics in the county, the number of construction projects described in **Table 1-2** would have the potential to impact population trends and could be cumulatively considerable.

Projects. The project description provided by the applicant does not specify what years the project would be under construction, but it is assumed it would likely take place approximately one year from the project approval. Only those related projects under construction during that period would be considered for cumulative impacts of the construction population on housing and public services. All projects in **Table 1-2** are located within the geographic scope for Socioeconomic cumulative effects, and thus are considered for co-location impacts.

5.11.2 Environmental Impacts

SOCIOECONOMICS	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project induce substantial unplanned 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)?	☐	☐	☒	☐
b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. 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				

SOCIOECONOMICS	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
performance objectives for any of the public services:				
i. Fire protection?	☐	☐	☒	☐
ii. Police Protection?	☐	☐	☐	☒
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒
d. 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?	☐	☐	☐	☒
e. 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?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, population and housing, public services, and recreation.

5.11.2.1 Methodology and Thresholds of Significance

For the Socioeconomics area, there are no applicable methodologies or additional thresholds of significance applicable to this project. Significant impacts are determined on an individual basis depending on the magnitude of the effects. An example of a potentially significant impact for this area would be the need for a new fire or sheriff's station, as determined by public safety authorities.

5.11.2.2 Direct and Indirect Impacts

a. Would the project induce substantial unplanned 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)?

Construction

Less Than Significant Impact. The proposed project would not directly or indirectly induce substantial unplanned growth in Shasta County. The project does not propose new housing, and it would not facilitate growth through the extension of roads, water supply pipelines, or other growth-inducing infrastructure. The project includes 48 wind turbines with a capacity of up to 205 MW of energy in addition to the infrastructure to support them (i.e., underground and overhead collection lines, access roads, substation). Although the project may increase the reliability of local electricity service

somewhat, most of the power would be distributed to the California electricity grid. It would not be an extension of infrastructure serving customers. Therefore, there would be no indirect population growth.

Construction of the proposed project is anticipated to last 24 months and employ an average of 71 full-time equivalent construction workers annually. There would be an estimated peak of approximately 200 workers on-site during peak construction months (FWPA, TN250915). Although the Shasta County Economic Forecast states that the Shasta County workforce was fully employed as of 2022 and would remain at elevated levels, the Employment Development Department 2020-2030 Occupational Employment Projections predicts a 20 percent increase in construction workers in the 2020-2030 period (CA DOT 2022; CA EDD 2023). Even with a fully employed construction workforce, construction projects are temporary in nature with peak and non-peak labor force needs. Based on the temporary nature of construction projects and the projected employment estimates reported in Table 5.11-3, staff concludes that the region is expected to have an adequate supply of construction trades workers for the project.

With a local construction workforce likely available to serve the project, it is not expected that workers would come from the outside area, and no construction workers are expected to seek temporary lodging closer to the project site. If a few construction workers were to seek temporary or permanent lodging closer to the project site, there would be sufficient housing supply (see Table 5.11-2) and availability of nearby RV parks, hotels/motels, and campsites (FWPA, TN 250497 and 250498). Additionally, with the recent (between 2020 and 2023) population decrease, the county can accommodate some growth. Therefore, the project's construction workforce would not directly or directly induce substantial population growth in the project area. The impact from project construction would be less than significant.

Operation

Less Than Significant Impact. The proposed project would create a relatively low number of permanent jobs, with an anticipated 8 full-time employees per year over the 35-year expected lifetime of the project. The permanent employee workforce is likely to be drawn from the labor supply in the Redding MSA. Therefore, operation workers are not likely to permanently relocate closer to the project site. However, even if all workers were to permanently relocate closer to the project, it is unlikely that these few workers would directly or indirectly induce a substantial population growth in the project area. The impact from project operation would be less than significant.

Applicant's Proposed Community Benefits Agreement

The Northeastern California Building & Construction Trades Council is planning on providing workforce training and worker recruitment as part of a proposed Community Benefits Agreement with the Applicant (Stantec 2023d). This Community Benefits Agreement is pursuant to California Code of Regulations, title 20, section 1878(c), which states, "No later than 45 days after an application is deemed complete, or a later date set forth by the executive director, the applicant shall provide information updating

or supplementing the information in the application to support the findings required by Public Resources Code sections 25545.9 and 25545.10."

The applicant executed an agreement with the Northeastern California Building & Construction Trades Council where funding would be provided by the applicant for workforce training and development purposes, specifically for workplace health and safety, job quality and job training, worker recruitment, screening, and hiring strategies and practices, targeted hiring planning and execution, investment in workforce training and education, and worker voice and representation in decision making affecting employment and training (Stantec 2023d). A portion of the funds would be used to conduct "(a) Project job fairs in both Redding and Burney on or before commencement of excavation work for the installation of a foundation for a wind turbine included in the Project or excavation work for roads included in the Project ('Project Construction Commencement') and (b) provide at least two month-long Multi-Craft Core Curriculum ('MC3') Trainings…In offering such services and trainings, the Union shall give preference to workers and applicants residing and working in areas near the Project site, including Round Mountain, Montgomery Creek, and Burney, to the extent feasible." (Stantec 2023d).

Scoping Comments

Scoping comments by Shasta County addressed concerns with the Community Benefits Agreement filed by the applicant. Shasta County stated that "The Applicant has once again filed a false community benefits plan with the Commission, thereby making the Fountain Wind Project ineligible for certification under the Commission's Assembly Bill 205 opt-in process," and has asked CEC to dismiss the Fountain Wind Project application for "failing to satisfy the community benefits agreement requirements of Public Resources Code section 24445.10 and 20 CCR section 1877 and terminate the proceeding." (COS 2024c). The County is concerned that the Northeastern California Building & Construction Trades Council is not a community-based organization under Public Resources Code section 25545.10. Additionally, Shasta County stated the agreed contribution of $175,000 from the Applicant is not a meaningful contribution (COS 2024c).

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Construction and Operation

No Impact. The proposed project is on private land managed for timber production. No population lives within the project site. As a result, the project would not displace any people or housing, and both construction and operation of the project would not require replacement housing to be constructed elsewhere. No impact would occur.

c. 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:

i. Fire protection?

Construction

Less Than Significant Impact. The project would require a temporary construction workforce. As stated in the application, there would be approximately 200 workers on-site during peak construction. Construction would last approximately 24 months. As discussed in subsection 5.11.1, the anticipated construction workforce for the project would likely be drawn from Shasta County. Based on the proximity of the anticipated workforce to the project, construction workers from neighboring cities and counties are not likely to temporarily move closer to the project site.

Therefore, this workforce is unlikely to increase the need for residential area fire services due to an in-migration population. Additionally, any changes to service ratios as a result of the project's construction phases would be temporary and would not require the need for new or physically altered fire protection facilities.

However, there is concern regarding the sufficiency of fire staffing to respond to existing needs. The region surrounding and including the project site is reliant on volunteer fire personnel, along with CAL FIRE and Shasta County professional firefighters. County fire stations are currently understaffed, and volunteer numbers have been in decline. CAL FIRE stations are fully staffed and equipped during the 9-month fire season, but there would be a strain on the County to respond during the off-season which is generally the wetter months of December, January, and February (CEC 2024g).

The proposed project does have the potential to exacerbate the fire staffing issue, which was noted by the Shasta County Fire Chief. There does not appear to be a need for new or physically altered fire facilities as a result of the project, which is the focus of this section. Although the issue of fire staffing during the project construction period is a concern from the public services and safety perspective, it is somewhat peripheral for Socioeconomics. Therefore, the impact of the proposed project's construction workforce would be less than significant. The fire staffing issue is discussed more specifically in **Section 4.4, Worker Safety and Fire Protection**.

Operation

Less Than Significant Impact. The project would require a small number of full-time employees on site (eight full time employees per year), and thus it is unlikely to affect

service ratios as a result of in-migration from the project's operation. The operations workers are unlikely to relocate closer to the project site, and even if all eight workers relocated, it is unlikely that there would be an increase in the need for fire protection services or an effect on service ratios.

Given the small number of operational employees, it is also very unlikely that new or physically altered fire facilities would be necessary. The few potentially relocated workers would be within the range of the projected populations for the county.

For the proposed project's operational phase, there does not appear to be a need for new or physically altered fire facilities, which is the focus of this section. Although the fire staffing issue is a concern from the public services and safety perspective, it is somewhat peripheral for Socioeconomics. Therefore, the impact of the proposed project's operational workforce would be less than significant. As noted above for the construction phase, the fire staffing issue is discussed more specifically in **Section 4.4, Worker Safety and Fire Protection**.

Scoping Comments

Scoping comments indicate concern over access through Terry Mill Road and the "T-Line" for ingress and egress from the west (from SR200 at the town of Round Mountain) and the east (from SR200 at Hatchet Mt. Summit). Concerns include restricted access to land due to construction and operation of the project. Comments state that restricted access could present a safety issue during wildfire events or medical emergencies to which Shasta County Fire staff would respond. This could cause an inability to get timely medical care or escape during an approaching fire, leading to injury or death (Dogwood Acres LLC 2024). These impacts are discussed in **Section 5.14, Transportation**.

ii. Police protection?

Construction

No Impact. The project's construction would not generate substantial population growth in the project area that would result in the need for additional police/sheriff's protection facilities for new residents. Based on the proximity of available construction workforce to the project, construction workers from neighboring cities or counties are not likely to temporarily relocate closer to the project site. However, if some workers were to temporarily relocate closer to the project, it is unlikely that there would be an increase in the need for police/sheriff's services or an effect on service ratios to the extent that new or physically altered police/sheriff's protection facilities would be necessary.

The applicant stated there that there would be fencing installed to surround the on-site electricity substation during site preparation for security. Additionally, "No Trespassing" and safety signs would be posted around towers, transformers, other high-voltage areas, and along roads (FWPA, TN 251663). The project could potentially cause a relatively small, incremental increase in police/sheriff's protection services due to

security issues during construction. However, it is not expected to be an increase that would require new or expanded police/sheriff's protection facilities to maintain acceptable service ratios, response times or other performance objectives for protection services. As there would be no need for new or physically altered police protection facilities, no impact would result from construction.

Operation

No Impact. The project's operation would require a small number of full-time employees on site (eight full time employees per year), and thus it is unlikely to affect service ratios as a result of the project's operation. The operations workers are unlikely to relocate closer to the project site, and even if all eight workers relocated, it is unlikely that there would be an increase in the need for police/sheriff's services or an effect on service ratios. Given the small number of operational employees, it is very unlikely that new or physically altered police/sheriff's facilities would be necessary. The few potentially relocated workers would be within the range of the projected populations for the county.

iii. Schools?

Construction

No Impact. The project would be located within Mountain Union Elementary School District and Shasta Union High School District, in addition to Fall River Joint Unified. Based on the number and proximity of the available workforce for the project, construction workers from the surrounding cities and counties are not likely to temporarily relocate closer to the project site. Based on staff's experience, construction workers who seek lodging closer to the project site do not bring their families with them. Therefore, construction workers who might temporarily relocate closer to the project site would not increase the need for school facilities or have an effect on service ratios to the extent that new or physically altered school facilities would be necessary. Therefore, no impact would result from construction.

Operation

No Impact. Based on the proximity of the small number of operational employees and their expected availability, operation workers from neighboring cities are not likely to permanently relocate to the project site. However, if some or all of the eight workers were to permanently relocate closer to the project, it is unlikely that there would be an increase in the need for schools or an effect on service ratios to the extent that new or physically altered school facilities would be necessary. As no new physically or altered school facilities would be needed, no impact would result from operation.

iv. Parks?

Construction

No Impact. Based on the proximity of available construction workforce to the project, the construction workforce would likely be drawn from Shasta County, and few workers would temporarily relocate closer to the project site. Based on staff's experience, workers who may relocate closer to the project usually return to their primary residence during the weekends. Temporary construction workers may visit park facilities before, during, or after a workday, but this would not result in many people visiting these facilities. Additionally, this would be a short-term use that would cease at the end of the project's construction period. It is unlikely that there would be an increase in the usage of, or demand for park facilities, to maintain acceptable service ratios or other performance objectives. As there would be no need for new or physically altered park facilities, no impact would result from construction.

Operation

No Impact. The project would be a low employment-creating use and would not generate substantial population growth in the project area that would result in the need for additional park facilities for new residents. Because of the availability of an existing workforce throughout Shasta County, the project's small number of permanent employees would likely reside within commuting distance of the project site and would not need to relocate closer to the project. These permanent employees would continue to be served by existing park facilities in their local communities, and project operations would not require new park facilities. If some or all of the operations workers were to relocate permanently closer to the project, it is unlikely that there would be an increase on the usage of or demand for parks to maintain acceptable service ratios or other performance objectives to the extent that new or physically altered parks would be necessary. As there would be no new or physically altered park facilities, no impact would result from operation.

v. Other public facilities?

Construction

No Impact. Based on the proximity of available construction workforce to the project, the construction workforce would likely be drawn from Shasta County, and few workers would temporarily relocate closer to the project site. However, if some construction workers were to temporarily relocate, they are not likely to visit public facilities such as public libraries while working in the project area. Based on staff's experience, these workers typically return to their primary residence over the weekend. Temporary construction workers are unlikely to visit public libraries in the project vicinity before, during, or after a workday. If some of the temporary construction workers were to visit the public libraries, this would not result in many people visiting these facilities and would be a short-term use that would cease at the end of the project's construction period. It is unlikely that there would be an increase in the usage of, or demand for,

other public facilities to maintain acceptable service ratios or other performance objectives. As no new or physically altered public facilities such as libraries would be required, no impact would result from construction.

Operation

No Impact. The project would not generate substantial population growth in the project area that would result in the need for additional public facilities or services for new residents. The project's small operations workforce is anticipated to be drawn from Shasta County and is not expected to relocate closer to the project site. However, if some or even all operations workers were to relocate permanently, it would be unlikely that there would be an increase in the usage of or demand for the surrounding libraries or other public facilities. As no new or physically altered public facilities such as libraries would be required, no impact would result from operations.

d. 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?

Construction

No Impact. Similar to the conclusion above for Parks and Other Public Facilities, given the proximity of available construction workforce to the project, the construction workforce would likely be drawn from Shasta County. Few, if any, workers from another county are likely to temporarily relocate closer to the project site. However, if some construction workers were to temporarily relocate, they may visit park or recreational facilities before, during, or after a workday, but this would not result in many people visiting these facilities and would be a short-term use that would cease at the end of the project's construction period. It is unlikely that there would be an increase in the usage of, or demand for, other park or recreational facilities to maintain acceptable service ratios or other performance objectives. An increase in the usage of parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated, is unlikely. Therefore, no impact would result from construction.

Operation

No Impact. Because the project would be a low employment-creating use, the proposed project would not generate substantial population growth in the project area that would result in the need for additional park or recreational facilities for new residents. Because the availability of an existing workforce throughout Shasta County, the project's small number of permanent employees would likely reside within commuting distance of the project site and would not need to relocate closer to the project. These permanent employees would continue to be served by existing parks and recreational facilities in their local communities, and project operations would not require new facilities to serve employee needs. If some or all workers were to relocate permanently closer to the project, it is unlikely that there would be an increase on the usage of or demand for

parks or other recreational facilities to maintain acceptable service ratios or other performance objectives. As no new or physically altered park facilities would be necessary, no impact would result from operation.

e. 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?

Construction and Operation

No Impact. Recreation facilities are not included as part of the project, and the project would not require the construction or expansion of a recreation facility. The project is on private property currently used for timber harvest. There are recreational facilities that are near the project, which are addressed in **Section 5.8, Land Use and Agriculture** and **Section 5.17, Forestry Resources.** The few operation workers that could relocate closer to the project site temporarily or permanently would not create the need for new or expanded recreational facilities to serve them. As no new or expanded recreational facilities are needed, no impact would result.

Scoping comments addressed concerns regarding the scenic quality, including night skies, of Shasta County's recreational areas, including National Recreation Areas, Scenic Byways, Forests, and National Parks. The proposed project is on private land managed for timber that is not used for recreation. Visual impacts from the project to nearby recreational areas are addressed in **Section 5.15, Visual Resources**.

5.11.2.3 Cumulative Impacts

The proposed project would have a potentially significant contribution to existing cumulative effects, as described below. Cumulative socioeconomics impacts could occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by the local labor force, resulting in an influx of non-local workers and their dependents. Operational cumulative socioeconomics impacts could occur when the development of multiple projects significantly impacts the population of an area, resulting in a housing shortage, change in local employment conditions, and an increased demand on public services or recreational facilities.

The population and housing effects would not be significant and have been accounted for in various local and regional plans and projections. However, there is potential for a cumulatively significant impact to public services due to the current staff shortages and needs of the fire service in the County.

Construction and Operation

Less Than Significant with Mitigation Incorporated. Construction of projects listed in **Appendix 1, Table 1-2** may need to use workers that would come from the same pool as the proposed project. As mentioned in subsection 5.11.1, the local construction workforce was fully employed at the time of the Shasta County Economic Forecast and

will continue to remain elevated through at least 2027. As discussed in subsection 5.11.2.2, the local workforce in Shasta County would be likely to accommodate the construction for the proposed project. However, due to the fully employed construction workforce in the area, there may be a need for non-local workers to temporarily relocate to the county to accommodate multiple concurrent construction projects, possibly creating an incremental cumulative impact.

While the construction of other projects may require the use of transient housing, there is an adequate number of available temporary housing that would likely be able to accommodate these construction workers for concurrent projects. Several of the projects listed in **Table 1-2** may not have timelines that overlap, and the possibility of a future project being proposed, approved, and constructed during the same time frame and within the same geographic extent is not known with any accuracy. The proposed project would not likely combine with most other identified projects to create a considerable cumulative impact to population and housing given the existing availability of temporary and permanent housing in the county that could accommodate construction workers moving into the area. Additionally, the projected population growth during the timing of construction of the proposed project would be able to accommodate some workers moving into the county, and thus not likely contribute to a significant cumulative impact on population or housing.

As discussed in subsection 5.11.2.2, the proposed project's small operational workforce is likely to come from the local area, with no in-migration that would increase the local population. Therefore, it would not contribute to cumulative increases in population that would generate an increase in demand for local housing and local public services.

Because Shasta County already faces challenges with fire staff and volunteer retention as well as a shortage of personnel to respond to existing needs, even an incremental effect from a project could result in a potentially significant cumulative impact. Shasta County's Fire Chief confirmed that as the county grows, fire services will need to grow to meet the new needs. These needs would include full staffing and new capital improvements to house the staff (i.e., a new fire station; CEC 2024g). See mitigation for **Section 4.4, Worker Safety and Fire Protection**. If mitigation involving additional fire staff and a related new fire station were in place, the cumulative impact would be reduced to a less than significant impact.

5.11.3 Project Conformance with Applicable LORS

Table 5.11-4 presents staff's determination of conformance with applicable local, state, and federal laws, ordinances, regulations, and standards (LORS), including any proposed conditions of certification, where applicable, to ensure the project would comply with LORS. No federal regulations related to socioeconomics apply to the project. Staff concludes that with implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "5.11.5 Proposed Conditions of Certification" contains the full text of the referenced conditions of certification.

TABLE 5.11-4 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
State	
California Education Code, section 17620	
The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities. See fee schedule at https://www.shastacoe.org/shasta-county-schools/business-services/developer-fee-services	**Yes.** The applicant would pay associated fees. Verification of payment would be ensured by **SOC-1.**
California Government Code, sections 65995-65998	
Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.	**Yes.** The proposed project would not trigger any state and local public agency fees, etc. to offset the cost for school facilities. Therefore, the project is in conformance.
Local	
Shasta County Development Impact Fees	
The County charges various development impact fees for industrial development. See fee schedule at https://www.shastacounty.gov/resource-management/page/fees	**Yes.** The proposed project may be subject to a Shasta County Development Impact Fee. Once the fee is paid, the project would be in conformance with this requirement. Verification of payment would be ensured by **SOC-2**.

5.11.4 Conclusions and Recommendations

As discussed above, with implementation of conditions of certification, the project would have a less than significant impact related to socioeconomics and would conform with applicable LORS. Staff recommends adopting the conditions of certification as detailed in subsection "5.11.5 Proposed Conditions of Certification" below.

However, staff has noted its concern in the Impacts discussion regarding the sufficiency of fire staffing to meet existing needs. The proposed project also has the potential to affect the fire staffing situation during its construction and operation phases. There is a less than significant cumulative impact with mitigation incorporated because Shasta County already faces challenges with staff and volunteer retention as well as a shortage of fire personnel for responding to existing needs. Even an incremental effect from the Fountain Wind project could result in this potentially significant cumulative impact. This is a particular concern during the off-season when the CAL FIRE staff would be unavailable. The fire staffing issue is addressed more specifically in **Section 4.4, Worker Safety and Fire Protection**, and **Section 5.7, Hazards, Hazardous Materials, and Wildfire**, of this document.

5.11.5 Proposed Conditions of Certification

The following proposed conditions of certification include measures to ensure conformance with applicable LORS.

SOC-1 The project owner shall pay the one-time statutory school facility development fees to the Shasta County Office of Education as required by Education Code 17620.

Verification: At least 30 days prior to the start of project construction, the project owner shall provide to the Compliance Project Manager proof of payment to the Shasta County Office of Education of the statutory development fee.

SOC-2 The project owner shall comply with the following one-time Development Impact Fees to Shasta County if applicable at the time of 30 days prior to the start of project construction.

On January 23, 2024, the Board of Supervisors of the County of Shasta enacted Ordinance No. 665-4, which amends Ordinance No. 665 of Shasta County, entitled "*An ordinance of the Board of Supervisors of the County of Shasta adopting public facility fees for all new development within the County of Shasta*," by suspending the collection of new public facility impact fees. The ordinance is effective thirty days after adoption.

In the event that the fees are reinstated 30 days prior to the start of construction, the project owner shall pay the one-time Development Impact Fees to Shasta County, according to the current fee price and schedule.

Verification: If fee is reinstated: at least 30 days prior to the start of project construction, the project owner shall provide to the Compliance Project Manager proof of payment to Shasta County of the development impact fee.

5.11.6 References

CA EDD 2023 – Employment Development Department, State of California (CA EDD). Labor Market Information Division, 2020-2030 Occupational Employment Projections, Redding Metropolitan Statistical Area, (Shasta County), data last updated May 26, 2023. Accessed on: October 16, 2023. Accessed online at: https://labormarketinfo.edd.ca.gov/file/occproj/redd$occproj.xlsx

CA DOF 2023a – California Department of Finance (CA DOF). E-5 Population and Housing Estimates for Cities, Counties and the State — 2020-2023, May 2023. Accessed on: October 16, 2023. Accessed online at: https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2023/

CA DOF 2023b – California Department of Finance (CA DOF). Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. July 2023. Accessed August 08, 2023. Accessed online at: https://dof.ca.gov/forecasting/demographics/projections/

CA DOT 2022 – California Department of Transportation (CA DOT). Shasta County Economic Forecast. Accessed on: December 14, 2023. Accessed online at: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/data-analytics-services/transportation-economics/socioeconomic-forecasts/2022/shasta-2022-a11y.pdf

CAL FIRE and SCFD 2022 – CAL FIRE and Shasta County Fire Department (SCFD). 2022 Annual Report. Accessed on: December 12, 2023. Accessed online at: https://www.shastacounty.gov/fire/page/annual-reports

CEC 2024g – California Energy Commission (TN 254837). ROC with Shasta County Fire Chief, dated March 5, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024c – County of Shasta (TN 253813). County of Shasta AB 205 Review and Comments on Fountain Wind Community Benefits Agreement Update and Submittal with Exhibits, dated January 5, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Dogwood Acres LLC 2024 – Dogwood Acres LLC 2024. Dogwood Acres LLC Comments on the Scope & Content of Draft EIR. Docket Number 23-OPT-01. TN #253803 and #253851. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Ed Data 2023 – Education Data Partnership (Ed Data). Fiscal, Demographic, and Performance Data on California's K-12 Schools. Accessed on: October 25, 2023. Accessed online at: https://www.ed-data.org/county/Shasta

FRJD 2023 – Fall River Joint Unified School District (FRJD). Fall River Joint Unified School District. Accessed on: October 25, 2023. Accessed online at: https://www.frjusd.org/

FWPA – Fountain Wind Project Application (TN 250915). Revised Fountain Wind EIA, dated July 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250497). SOC2-12 RV Parks, dated June 2, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250498). SOC2-011 Lodging, dated June 2, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Google Maps 2023. Search for Fire Stations. Accessed on: October 25, 2023. Accessed online at: https://www.google.com/maps/search/fire+station/

Shasta County 2009 – Shasta County. Shasta County Parks, Trails and Open Space Plan. Accessed on: November 16, 2023. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3309/parks-trails-open-space-plan.pdf

Shasta County 2023a – Shasta County. Shasta County Fire. Accessed on: October 25, 2023. Accessed online at: https://www.shastacounty.gov/fire/page/fire-stations-battalions

Shasta County 2023b – Shasta County. Adopted Budget: Fiscal Year 2023-2024. Accessed on: January 25, 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/county_administrative_office/page/4416/final_adopted_budget_book_fy2324_.pdf

Shasta County 2023c – Shasta County. Sheriff's Office. Fire Stations & Battalions. Accessed on: October 25, 2023. Accessed online at: https://www.shastacounty.gov/sheriff

Shasta County 2023d – Shasta County. Shasta County Office of Education Map. Accessed on: October 25, 2023. Accessed online at: https://gis.shastacounty.gov/portal/apps/webappviewer/index.html?id=3c06c6432f224402901aba2d67638888

Shasta COE 2023 – Shasta County Office of Education. School and District Resources. Accessed on: December 18, 2023. Accessed online at: https://www.shastacoe.org/shasta-county-schools

Shasta Public Libraries 2023 – Shasta Public Libraries. Services. Accessed on: October 25, 2023. Accessed online at: https://www.shastalibraries.org/services/

Stantec 2023d – Stantec. (TN 253611). Fountain Wind Community Benefit Agreement, dated December 14, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

5.12 Solid Waste Management

5.12.1 Environmental Setting

The project would be located in a rural portion of Shasta County, approximately 30 miles northeast of Redding, California, and 7 miles west of Burney, California. The project, as currently revised, would consist of up to (48) wind turbines and support facilities covering approximately 475 acres and would disturb approximately 868 acres during construction (Stantec 2021). State Route 299 (SR 299) passes along the northern portion of the project area. According to the Shasta County map viewer website, the majority of the project area is zoned as timber production and the reminder designated as unclassified (Shasta County 2023).

Solid Waste Generation and Disposal

Solid waste collection and recycling in the project area would be provided by Waste Management, Inc. Although the applicant has identified the Burney Transfer Station as initially receiving solid waste, the Round Mountain Transfer Station is closer and in the direction of the Anderson Landfill which would probably be the ultimate destination for solid waste. All of these facilities are operated by Waste Management, Inc. Anderson Landfill is located approximately 40 miles southwest of the project site. It is permitted through 2093 to accept 1,850 tons per day and has a remaining capacity of approximately 10.4.4 million cubic yards (CalRecycle 2023).

Regulatory

Federal

Resource Conservation and Recovery Act (RCRA), 40 CFR, Subtitle D. RCRA Subtitle D regulates the disposal of non-hazardous waste. It includes guidelines for; storage and collection of residential, commercial and institutional solid waste (Part 243), source separation for material recovery (Part 246), and design of municipal solid waste facilities (Part 258).

State

California Assembly Bill 939 (Integrated Waste Management Act, PRC Section §40000). The Integrated Waste Management Act of 1989 established the California Integrated Waste Management Board (CIWMB), revamped the government codes regulating solid waste management, and required cities and counties to reduce the amount of solid waste disposed of in landfills by 50 percent. To comply with the Integrated Waste Management Act, counties must adopt regulations and policies to fulfill the requirements of the Act.

California Assembly Bill 341 (Mandatory Commercial Recycling Measure, PRC Section §42920). Effective on May 7, 2012, AB 341 set a statewide goal of reducing

solid waste by 75 percent by 2020. It also established mandatory recycling programs for solid waste generated by businesses, public entities, and multi-family dwellings generated solid waste. In addition, the Governor signed SB 1018 on July 27, 2012, which required any business generating over 4 cubic yards of solid waste per week to arrange for recycling services.

California Senate Bill 1383 (Short-Lived Climate Pollutant Reduction Law, PRC Section §42652). Approved by the Governor on September 19, 2016, SB 1383 established statewide targets to reduce disposal of organic waste to 50 percent of 2014 levels by 2020 and to 75 percent of 2014 levels by 2025.

California Energy Efficiency Standards for Residential and Nonresidential Buildings—Green Building Code (2011), CCR Title 24 Update (2019). The California Green Buildings Standards Code applies to the planning, design, operation, construction, use, and occupancy of newly constructed buildings and requires energy and water-efficient indoor infrastructure. The related waste management plan is required to allow for the diversion of 50 percent of the generated waste away from the landfill.

Local

Shasta County General Plan. The following objectives and policies apply to public facilities (Shasta County, 2004):

- *PF-3* - Develop the Shasta County solid waste program in accordance with the adopted management plans.
- *PF-c* - Shasta County shall take actions required to implement plans for the management of its solid waste stream.
- *PF-h* - Public uses (e.g. schools, parks, waste disposal sites) and public utilities (e.g. substation.

Shasta County Ordinance 8.32, Refuse Collection and Disposal. This County ordinance regulates the proper collection and disposal of refuse.

Shasta County Ordinance 8.34, Organic Waste Disposal Reduction. In the spirit of California SB 1383, this County ordinance in part encourages commercial generators to participate in programs that recycle and divert organic waste from landfills.

5.12.2 Environmental Impacts

SOLID WASTE MANAGEMENT Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or	☐	☐	☒	☐

SOLID WASTE MANAGEMENT Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
otherwise impair the attainment of solid waste reduction goals?				
b. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, utilities and service systems.

5.12.2.1 Methodology and Thresholds of Significance

The solid waste facility identified by the applicant to support the project was evaluated for compliance with State regulation and requirements, as well as assessed to determine if the proposed project would pose an undue burden on landfill capacity.

5.12.2.2 Direct and Indirect Impacts

a. Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Construction and Operations

Less Than Significant Impact. During construction, an estimated 40,000 pounds, or 20 tons, of solid waste consisting of scrap lumber and metal would be generated each month. The estimated 18 to 24 month construction period would result in 360 to 480 tons of solid waste or a volume of 1,440 to 1,920 cubic yards based on the type of material (SCDHEC 2015). Biodegradable waste associated with timber harvesting operations and clearing would be recycled or reused. A minimal amount of office and paper waste would be generated during project operations.

As stated in the "Environmental Setting" subsection, solid waste would be collected by Waste Management, Inc. and disposed/recycled at Anderson Landfill. Anderson Landfill is permitted through 2093 and has a remaining capacity of 10,409,132 cubic yards (CalRecycle 2023). The upper limit of estimated volume produced during project construction would represent a minimal effect on landfill capacity.

The waste management plans required in Condition of Certification **SOLID WASTE-1** would ensure the recycling of project solid waste generated during both construction and operation to the greatest extent possible.

Therefore, the impact resulting from the proposed project on landfill capacity would be less than significant.

b. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Construction and Operation

No Impact. The California Integrated Waste Management Act of 1989 (Assembly Bill 939) requires local jurisdictions in California to reduce, by 50 percent, the amount of solid waste disposed of in landfills by the year 2000 and beyond.

During construction, the project would collect and haul construction debris off-site for recycling or disposal in local jurisdictions within Shasta County that have programs in place to ensure that disposal of solid waste complies with state requirements. The project would comply with these requirements pursuant to Shasta County requirements. The project would not generate any special or unique wastes during the construction phase that would make the project not comply with federal, state, and local statutes or solid waste management and reduction regulations. Management of hazardous waste and applicable federal regulations are discussed in **Section 5.7, Hazards, Hazardous Materials, and Wildfire**.

During operation, the project would comply with federal, state, and local statutes and regulations related to solid waste. There would be no change in compliance with federal, state, or local statutes and regulations related to solid waste management and reduction.

No impact would occur.

5.12.2.3 Cumulative Impacts

Less Than Significant. Anderson Landfill has sufficient remaining capacity of over 10 million cubic yards out of a total capacity of 16 million cubic yards to serve the Project (CalRecycle 2023). The Project would generate approximately 22 cubic yards per week during construction and less than 1 cubic yard per week during operation, which would either be recycled or disposed of at the Anderson Landfill. Other projects within the City of Redding that could generate large amounts of solid waste, such as the Dignity Health North State Pavilion Project, would dispose of waste at the Richard W. Curry Sanitary Landfill (City of Redding, 2019). There is no major development planned in Shasta County near the project site that would increase solid waste disposal demand and result in exceeding Anderson Landfill capacity.

Therefore, cumulative impacts with respect to solid waste would be less than significant.

5.12.3 Project Conformance with Applicable LORS

Table 5.12-1 presents staff's determination of conformance with applicable local, state and federal laws, ordinances, regulations and standards (LORS), including any proposed

Conditions of Certification, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with the implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced conditions of certification.

TABLE 5.12-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Federal	
Resource Conservation and Recovery Act (RCRA)	
40 CFR, Subtitle D. Provides guidelines for the storage and collection of residential, commercial, and institutional solid waste (Part 243), source separation for material recovery (Part 246), and design of municipal solid waste facilities (Part 258).	**Yes.** All landfills proposed for use with the project would comply with Federal regulations.
State	
Integrated Waste Management Act (Assembly Bill 939)	
AB 939/Public Resources Code Section §40000. Established the California Integrated Waste Management Board (CIWMB), revamped the government codes regulating solid waste management, and required cities and counties to reduce the amount of solid waste disposed of in landfills by 50 percent.	**Yes.** All landfills proposed for use with the project would comply with State statutes.
California Assembly Bill 341 (Reduction of Solid Waste).	
AB 341/Public Resources Code Section 42926(a). Set a statewide goal of reducing solid waste by 75 percent by 2020. It also established mandatory recycling programs for solid waste.	**Yes.** All landfills proposed for use with the project would comply with State statutes. COC **SOLID WASTE-1** would assist with the solid waste reduction requirement of the statute.
California Senate Bill 1383 (Reduction of Organic Waste)	
SB 1383/CCR Title 14 Section §17402. Established statewide targets to reduce 2014 organic waste levels to 50 percent by 2020 and to 75 percent by 2025.	**Yes.** All landfills proposed for use with the project would comply with State regulations.
Local	
Shasta County Ordinance	
Chapter 8.32. This chapter of the County ordinance entails all aspects of solid waste management.	**Yes.** All landfills proposed for use with the project would comply with local ordinances.
Chapter 8.34. This County ordinance establishes programs that recycle and divert organic waste fom landfills.	

5.12.4 Conclusions and Recommendations

As discussed above, with the implementation of Conditions of Certification, the project would have a less than significant impact related to solid waste management and would conform with applicable LORS. Staff recommends adopting the Conditions of

Certification as detailed in subsection "5.12.5 Proposed Conditions of Certification" below.

5.12.5 Proposed Conditions of Certification

The following proposed Conditions of Certification include measures to ensure conformance with applicable LORS.

SOLID WASTE-1 The project owner shall prepare a Construction Waste Management Plan and an Operation Waste Management Plan for all wastes generated during construction and operation of the facility, respectively, and shall submit both plans to the Compliance Project Manager (CPM) for review and approval. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the CPM.

The Operation Waste Management Plan shall be submitted to the CPM no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to the planned management methods.

5.12.6 References

CalRecycle 2023 – California Department of Resources Recycling and Recovery (CalRecycle). Anderson Landfill (45-AA-0020), SWIS Facility/Site Summary website. Accessed: December 22, 2022. Available online at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/1049?siteID=3457

City of Redding 2019 – Dignity Health Redding North State Pavilion Project Draft Environmental Impact Report, Section 5.16, Utilities and Service Systems. Available online at: https://drive.google.com/drive/folders/1uTIPs7hyi1wXAcXAKGIy2-5aL2m6sXvF

Shasta County 2004 – Shasta County Planning Division (Shasta County). Shasta County General Plan, amended September 2004. Accessed on April 19, 2023. 7Available

online at: https://www.shastacounty.gov/planning/page/general-plan

Shasta County 2023 – Shasta County GIS Division (Shasta County). Shasta County Map Viewer. Accessed on February 21, 2023. Available online at: https://maps.shastacounty.gov/ShastaCountyMap/

SCDHEC 2015 – South Carolina Department of Health and Environmental Control (SCDHEC). Volume-To-Weight Conversion Factors table. Prepared May 5, 2015. Accessed on November 6, 2023. Available online at: https://dc.statelibrary.sc.gov/bitstream/handle/10827/18367/DHEC_Volume_to_Weight_2015-03.pdf?sequence=1&isAllowed=y

Stantec 2021 – Stantec Consulting Services, Inc. (Stantec). (TN 248330-2). Refinements to the Proposed Fountain Wind Project. September 24, 2021. Accessed on March 30, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

5.13 Transmission Line Safety and Nuisance

This section describes the environmental and regulatory setting, and discusses impacts associated with the construction and operation of the project and project conformance with applicable laws, ordinances, regulations, and standards (LORS) specific to transmission line safety and nuisance. The project components and their operation that could result in impacts associated with transmission line safety and nuisance and are regulated by applicable LORS include the proposed 230 kilovolt (kV) substation, switching station, and a small segment of 230 kV generator tie-line to connect the proposed project to the newly constructed 230 kV Pacific Gas and Electric (PG&E) switching station.

5.13.1 Environmental Setting

The proposed project would change the environmental setting by adding a 230 kV substation, switching station, and a small segment of 230 kV generator tie-line to connect the proposed project to the newly constructed 230 kV PG&E switching station. The project site boundary comprises approximately 2,855 acres in the project area and includes the location of all infrastructure.

Regulatory

The national, federal, state, and local laws and policies in the next section apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements. There are different versions of the National Electrical Code (NEC) enforced throughout the United States, and this is because the Code does not actually fall under federal law. Instead, it is a "uniform code", a set of guidelines which each state may adopt and apply as they see fit.

National

Institute of Electrical and Electronics Engineers (IEEE). IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. IEEE and its members inspire a global community through its highly cited publications, conferences, technology standards, and professional and educational activities.

American National Standards Institute (ANSI). ANSI is a private, non-profit organization that administers and coordinates the U.S. voluntary standards and conformity assessment system.

National Electrical Safety Code (NESC). NESC is a United States standard of the safe installation, operation, and maintenance of electric power and communication

utility systems including power substations, power and communication overhead lines, and power and communication underground lines.

Federal

Code of Federal Regulations (CFR). Title 47, CFR, section 15.205, Federal Communications Commission (FCC)

Prohibits operation of devices that can interfere with radio- frequency communication.

Title 14, Part 77 of the Code of Federal Regulations (CFR)," Objects Affecting the Navigable Air Space FAA Advisory Circular No. 70/7460-1L (2015), "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space."

FAA Advisory Circular 70/7460-1L, "Obstruction Marking and Lighting"

State

California Public Utilities Commission General Order 52 (GO-52)

Governs the construction and operation of power and communications lines to prevent or mitigate interference.

CPUC, General Order-131-D" Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California"

Specifies application and noticing requirements for new line construction including EMF reduction.

CPUC, General Order 95 (GO-95), "Rules for Overhead Electric Line Construction"

Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.

CPUC, General Order 128 (GO-128), "Rules for construction of underground electric supply and communication systems"

The order formulates uniform requirements for underground electric supply and communication line construction in California.

California Code of Regulations (CCR). Title 8, California Code of Regulations (CCR) section 2700 et seq. "High Voltage Safety Orders"

Specifies requirements and minimum standards for safely installing, operating, working around and maintaining electrical installations and equipment.

Title14, Cal. Code Regs., sections 1250-1258, "Fire Prevention Standards for Electric Utilities"

Provides specific exemptions from electric pole and tower firebreak and conductor

clearance standards and specifies when and where standards apply.

Cumulative

Cumulative impacts of Transmission Line Safety and Nuisance (TLS&N) would be considered if there were other power-generating facilities adjacent to the Fountain Wind Project (Fountain Wind or project). Since there are no other power-generating facilities adjacent to Fountain Wind, there would be no adverse cumulative impacts due to Fountain Wind combined with other projects.

5.13.2 Environmental Impacts

TRANSMISSION LINE SAFETY AND NUISANCE Would the project's transmission line either physically or electrically (via its electromagnetic field):	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Affect aviation safety	☐	☒	☐	☐
b. Interfere with radio frequency communication	☐	☐	☒	☐
c. Be a source of audible noise	☐	☐	☒	☐
d. Be a fire hazard	☐	☒	☐	☐
e. Be a source of hazardous shock	☐	☒	☐	☐
f. Be a source of nuisance shock	☐	☒	☐	☐
g. Affect public health	☐	☒	☐	☐

Environmental checklist established by Cal. Code Regs., tit. 20, Div. 2, Ch. 5, Power Plant Site Certification, Appendix B, (18) Transmission System Safety and Nuisance.

Transmission System Components

This section assesses the proposed project's transmission line design and operational plan to determine whether the field and non-field impacts would constitute a significant environmental hazard in the area around the proposed route. All related health and safety laws, ordinances, regulations, and standards (LORS) are currently aimed at minimizing such hazards.

CEC staff's analysis focuses on the following issues, considering both the physical presence of the line and the physical interactions of its electric and magnetic fields:

- aviation safety
- interference with radio-frequency communication
- audible noise
- fire hazards
- hazardous shocks
- nuisance shocks

- electric and magnetic field (EMF) exposure

The project proposes to develop, construct, and operate a renewable wind-generating facility that can provide grid reliability. The project includes 48 wind turbines, each with a generating capacity of up to 7.2 MW. Each turbine's total height would not exceed 610 feet above ground level. The total expected capacity of the project would be 205 MW.

The applicant provided overhead and underground electrical one-diagrams for the 34.5 kV turbine collector feeder circuits, illustrating how they will be connected to the project's on-site substation. The underground collector system would contain insulated cables buried in trenches that are 46 inches deep and at least 12 inches wide. Each trench would contain power cables, a ground wire, and a fiber optic communication cable. The 34.5 kV overhead electrical collector system would be installed on wood poles with a maximum height of 90 feet and wire heights between approximately 20 to 30 feet above the ground depending on the span. A communication system also would be installed within the same footprint. The communication system comprises fiber optic communication cabling for the Supervisory Control and Data Acquisition (SCADA), which provides communication capabilities between turbine locations, substations, and operation and maintenance (O&M) facilities. An approximately 80-foot-wide corridor would be maintained during the operations phase of the collector overhead lines.

All four-collector feeder voltages step up to 230 kV by one or two three-winding transformers of the project’s substation. The substation consists of 230 kV breakers, bus bars, two three-winding transformers, disconnect switches, capacitor banks, a grounding grid, and other protection devices, etc. The Gen-tie would be constructed with (2) 1272 circular mil (kcmil) All Aluminum Conductor (AAC) per phase, 230 kV circuit. Short segment of gen-tie line would facilitate interconnecting the project substation with the new switchyard. The switchyard includes breakers, disconnect switches, grounding grids, protection devices, etc. The Fountain Wind project would own, operate, and maintain the newly built 230 kV project substation and gen-tie. The switchyard will be constructed by the applicant and transferred to PG&E for operation and maintenance purposes.

The PG&E, 230 kV Cottonwood-to-Pit 1 transmission line would loop in and out of bay 2 of the newly constructed switchyard and create a project interconnection into the PG&E grid. To complete the interconnection, an existing pole will be removed from PG&E's 230 kV Cottonwood-to-Pit 1 circuit and replaced with four tubular steel poles. The conductors will be routed along the four new poles and into the switching station.

Grounding Safety is essential for site personnel and electrical equipment. The electrical system is protected (protection schemes by utilizing SCADA) against ground faults that result in unit ground potential rises. The station grounding system provides a path to dissipate unsafe ground fault currents and reduces the ground potential rise. The grounding conductor will be sized for sufficient capacity to reduce the most severe fault conditions within allowable limits. The project’s onsite substation and switchyard

electrical components and each pole of the gen-tie line would be grounded according to the National Electrical Safety Code (NESC), California Public Utilities Commission (CPUC) G.O.95, and 128 standards and guidelines.

Staff has concluded that the first point of grid interconnection would be the newly constructed switching station adjacent to the project substation as proposed by the applicant and therefore staff must examine the impacts accordingly. For a more detailed discussion regarding the first point of grid interconnection, please see the staff's Transmission System Engineering Section.

With the current land uses in the vicinity of the proposed lines, residential exposure to the generated fields would be limited. Site access is restricted and would be limited to station workers, incidental construction and maintenance personnel, other company personnel, regulatory inspectors, and approved guests. Because access would not be available to the public, exposure to electric and magnetic fields (EMF) is not expected to occur from the Fountain Wind project or the transmission facilities to be constructed as part of the project (FWPA TN 248290-1 through TN 248290-5, Project Description, subsections 2.1, 3.1 and 3.2, figures 6 and 7).

5.13.2.1 Methodology and Thresholds of Significance

The LORS and practices listed in **Table 5.13.1** have been established to maintain impacts below levels of potential environmental significance. Thus, if staff determines that the project would comply with applicable LORS, we will conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

5.13.2.2 Direct and Indirect Impacts

a. Would the project's transmission line either physically or electrically (via its electromagnetic field) affect aviation safety?

Less Than Significant with Mitigation Incorporated. For the Fountain Wind project, transmission lines could cause a potential hazard to aircraft in the area and could potentially cause a collision in the navigable airspace. The requirements in the LORS listed in **Table 5.13.1** establish the standards for assessing the potential for obstruction hazards within the navigable airspace. The requirements also establish the criteria for determining when to notify the Federal Aviation Administration (FAA) about such hazards. For example, FAA notification is required in cases of structures over 200 feet above ground level, or if the structure were to be less than 200 feet in height but located within the restricted airspace in the approaches to public or military airports and heliports. Moreover, for airports with runways longer than 3,200 feet, the restricted space is defined by the FAA as an area of space that extends 20,000 feet (3.3 nautical miles) from the runway. For airports with runways of 3,200 feet or less, the restricted airspace is defined as a space that extends 10,000 feet from the runway. For heliports,

the restricted space is an area of space that extends 5,000 feet (0.8 nautical miles) from the landing site.

Staff has assessed the potential for an aviation hazard regarding the height of the proposed project transmission lines. The Project overhead collector transmission system would be 90 feet in height, which is less than the 200-foot height of concern to the FAA. Selected turbines and meteorological evaluation towers (METs) would have flashing red lights installed to improve visibility for aviation and that comply with Federal Aviation Administration (FAA) standards and Advisory Circular 70/7460-1L (FAA 2016). By these standards, the Applicant would prepare a lighting plan for the project and obtain FAA approval that would specify the installation of flashing red lights on designated turbines and METs to improve visibility for aviation and further reduce impacts to aviation from the transmission lines. The nearest municipal airport (Redding Municipal Airport) is 12.2 miles away from the project's site. Therefore, staff concludes that the transmission lines would not be a significant collision risk after mitigation is implemented to the area aviation or aircraft. Staff recommends that Condition of Certification **TLSN-5** be met to ensure conformance with Title 14, Part 77 of the Code of Federal Regulations requirement. (FWPA TN 248290-1 through TN 248290-5, Project Description, subsection 3.11, pages 11 and 12, figures 6 and 7)

b. Would the project's transmission line either physically or electrically (via its electromagnetic field) interfere with radio-frequency communication?

Less Than Significant Impact. Transmission line-related radio-frequency interference is one of the indirect effects of line operation. It is produced by the physical interactions of line electric fields. More specifically, such interference is due to radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as *corona discharge* but is referred to as *spark gap electric discharge* when it occurs within gaps between the conductor and insulators or metal fittings. Corona from a transmission line may result in radio and television reception interference, audible noise, light, and the production of ozone. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication.

Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration, and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts therefore would be minimized by reducing the line electric fields and by locating the line away from inhabited areas.

The Fountain Wind project transmission lines would be built and maintained according to standard practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345

kV and above, and not for 230 kV lines such as the proposed line of the Fountain Wind project. The proposed Project's generation tie-line is rated at less than 345 kV and there are no nearby residents to the project boundary. It is unlikely that the project transmission line would have any effect on radio or television reception due to unbuilt bare land around the transmission interconnection. Staff does not expect any corona-related radio-frequency interference or complaints and does not recommend any related condition of certification.

c. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a source of audible noise?

Less Than Significant Impact. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line's electric field, the potential for perception would be assessed by estimating the field strengths during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. Audible noise is, therefore, not generally expected at significant levels from lines of less than 345 kV as proposed for the Fountain Wind project. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing that the fair-weather audible noise from modern transmission lines is generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the proposed line right-of-way would fall mainly within the boundaries of the Fountain Wind project boundary and PG&E service area. staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. (FWPA TN 248290-1 through TN 248290-5, Project Description, subsection 3.1 to 3.2, Figures 6 and 7)

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. Instead, such audible noise is limited through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on online safety, efficiency, maintainability, and reliability. Since these designs are also aimed at minimizing field strengths, staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed project and related facilities, please refer to the staff's analysis in **Section 5.9, Noise and Vibration**.

d. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a fire hazard?

Less Than Significant with Mitigation Incorporated. The fire hazards addressed in **Table 5.13.1** are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between a line and nearby trees and other combustible objects.

The requirements of the existing PG&E fire prevention and suppression program would be implemented for the proposed project line. The applicant would comply with Title 14, California Code of Regulations, Section 1250, Article 4, which establishes fire prevention standards for electric power generation facilities. Also, CPUC GO-95 establishes rules and guidelines for transmission line construction including clearances from other manmade and natural structures, and tree-trimming requirements to mitigate fire hazards. Therefore, the applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Although the new line would be located within the Fountain Wind project's site area, Conditions of Certification **TLSN-1 and TLSN-2** are recommended to ensure compliance with these program requirements.

e. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a source of hazardous shock?

Less Than Significant with Mitigation Incorporated. Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death. Hazard shocks remain a driving force in the design and operation of transmission and other high-voltage lines.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

Potentially hazardous shocks could result from electrical faults from the new Fountain Wind project equipment or the PG&E high-voltage transmission system. The existing PG&E 230-kV transmission system is located within a secured area under PG&E's access control. The New PG&E switchyard is fenced to keep individuals from entering the area where they could be exposed to associated hazardous shocks. The new Fountain Wind project's 230-kV generation tie lines would be designed in conformance with applicable LORS. Implementing the GO-95-related measures against direct contact with the energized line would serve to minimize the risk of hazardous shocks. Because the lines would be constructed in conformance with the requirements of CPUC GO-95 and Title 8 California Code of Regulations (CCR) 2700, hazardous shocks are highly unlikely to occur as a result of the project's construction and operation. Staff's recommended Conditions of Certification **TLSN-1** and **TLSN-3** would implement mitigation measures to reduce impacts to less than significant. (FWPA TN 248290-1 through TN 248290-5, Project Description sections 3.1 figures 6 and 7)

f. Would the project's transmission line either physically or electrically (via its electromagnetic field) be a source of nuisance shock?

Less Than Significant with Mitigation Incorporated. Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They

result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). The potential for nuisance shocks around the proposed line would be minimized through standard industry grounding practices.

For the proposed project line, the project owner would be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff recommends Condition of Certification **TLSN-3** to ensure such grounding for Fountain Wind project (FWPA TN 248290-1 through TN 248290-5, Project Description, subsections 3.1 and 3.2).

g. Would the project's transmission line either physically or electrically (via its electromagnetic field) affect public health?

Less Than Significant with Mitigation Incorporated. Both electric and magnetic fields are created whenever electricity flows, and exposure to them together is generally referred to as electric and magnetic field (EMF) exposure. There is public concern regarding the possibility of health effects from EMF exposure. The electrical transmission interconnection and other electrical devices that would be constructed as part of the project emit EMF when in operation. These fields are typically measured near ground level, where they are encountered by people. EMF fields, to the extent they occur, could impact receptors on the properties adjacent to the project site (FWPA TN 248290-1 through TN 248290-5, Project description, section 3.1 and 3.2).

As previously stated, the Project electrical transmission interconnection and other electrical devices would be located mainly within the Fountain Wind project site and PG&E's transmission system. There are no receptors adjacent to the Project site. Site access is restricted and would be limited to station workers, incidental construction and maintenance personnel, other company personnel, regulatory inspectors, and approved guests. Because access would not be available to the public, public exposure to EMF is not expected to occur from the Fountain Wind project or the transmission facilities to be constructed as part of the project (FWPA TN 248290-1 through TN 248290-5, Project description, section 3.1 and 3.2).

Industries and Applicant's Approach to Reducing EMF Exposures

The present focus of EMF exposure concern is on the magnetic field. This is because, unlike electric fields, magnetic fields would penetrate the soil, buildings, and other materials to produce the types of human exposures at the root of health concerns. The

industry seeks to reduce exposure, not by setting specific exposure limits, but through design guidelines that minimize exposure in each given case.

In comparison to the strong magnetic fields from the more visible high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields from high-voltage lines while using some common household appliances (NIEHS 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short term duration, while the exposures from power lines are lower level, but long-term duration. Scientists have not established which of these exposure types would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

As with Fountain Wind project lines, specific field strength-reducing measures would be incorporated into the proposed line design to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures that could be applied include the following:

1. increasing the distance between the conductors and the ground to an optimal level.
2. reducing the spacing between the conductors to an optimal level.
3. minimizing the current in the line; and
4. arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Long-term residential field exposures would not be a significant concern since the route of the proposed project's transmission line avoids residences. The field strengths of most significance would be encountered within the boundaries of the Project site, the proposed Fountain Wind project site, and a PG&E-controlled area. These field intensities would depend on the effectiveness of the applied field-reducing measures. The requirements in Condition of Certification **TLSN-4** for field strength measurements are intended to assess the applicant's assumed field reduction efficiency. As previously noted, the current health-risk-driven CPUC policy on EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in the case of the Fountain Wind project is PG&E. Since the proposed project's 230-kV lines would be designed according to the respective requirements of the LORS listed in **Table 5.13.1** and operated and maintained according to current CPUC G.O 95 guidelines online safety and field strength management, staff considers the proposed design and operational plan to comply with the health and safety requirements of concern in this analysis. The actual contribution to the area's field exposure levels would be documented for the proposed route from the results of the field strength measurements required in Condition of Certification **TLSN-4,** for field strength measurements are intended to assess the applicant's assumed field reduction efficiency.

5.13.2.3 Cumulative Impacts

No Impact. There are no other power-generating facilities adjacent to the Fountain Wind project, and thus, there would be no adverse cumulative impacts due to the Fountain Wind project combined with other projects.

5.13.3 Project Conformance with Applicable LORS

Table 5.13-1 shows the staff's determination of conformance with applicable local, state, and federal LORS, including any proposed conditions of certification, where applicable, to ensure the project would comply with LORS. As shown in this table, the staff concludes that with the implementation of specific conditions of certification, the proposed project would be consistent with all applicable LORS.

TABLE 5.13-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR)," Objects Affecting the Navigable Air Space". Describes the criteria for determining the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.	**Yes.** The Project's overhead collector transmission system would be 90 feet in height, which is less than the 200-foot height of concern to the FAA. Additionally, the applicant would install lighting circuits to enhance the visibility of the turbines.
Title 47, CFR, section 15.205, Federal Communications Commission (FCC). Prohibits the operation of devices that can interfere with radio-frequency communication.	**Yes.** The applicant would not use any equipment that emits restricted frequency bands given under section 15.205 of FCC.
FAA Advisory Circular No. 70/7460-1L (2015), "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	**Yes.** The applicant would file form 7460 with the FAA and get approval to install the proper lighting circuits for turbines.
FAA Advisory Circular 70/7460-1L, "Obstruction Marking and Lighting"	**Yes.** The applicant would file form 7460 with the FAA and get approval to install the proper lighting circuits for turbines.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52). Governs the construction and operation of power and communications lines to prevent or mitigate interference.	**Yes.** The applicant would not construct or operate transmission or communication lines for the prevention or mitigation of inductive interference.
California Public Utilities Commission (CPUC) General Order (GO-95 and GO-128), "Rules for Overhead and Underground Electric Line Construction". Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.	**Yes.** The applicant would construct overhead collector feeder poles and transmission lines with a height of less than 200 feet to satisfy the G.O 95 clearance requirement. All collector feeder poles, components of the substation, and switchyard would be constructed according to the G.O. 95 and 128 electrical grounding standards. Underground circuits of the project would utilize the duct banks to minimize the EMF effects. Thereby satisfy the G.O.128 standards.

TABLE 5.13-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
	The applicant would utilize the lighting arresters in the substations, switchyard, and circuit poles as it is necessary. Thereby dissipating the fault currents due to lighting.
Title 8, California Code of Regulations (CCR) section 2700 et seq. "High Voltage Safety Orders". Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.	**Yes.** All collector feeder poles, collector feeder circuits (overhead/underground), substations, and switchyard components would be constructed according to "High Voltage Safety Orders".
National Electrical Safety Code (NESC). Specifies grounding procedures to limit nuisance shocks. It also specifies minimum conductor ground clearances.	**Yes.** All collector feeder poles, components of the substation, and switchyard would be constructed according to the NESC standards and G.O. 95 and 128 grounding standards. Overhead and underground grounding circuits will be designed with proper conductor sizes to dissipate the fault current. The applicant will select proper conductor sizes to satisfy the NESC standards. All the components of the substation or switchyard would be grounded by utilizing the underground grounding grid. The applicant will assess the soil resistivity test for the project's substation, switchyard sites, and transmission line path.
GO-131-D, CPUC" Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California". Specifies application and noticing requirements for new line construction including EMF reduction.	**Yes.** The project would be built with proper transmission line clearance with the ground and satisfy G.O.95 Transmission paths Right-of-way requirements. Underground circuits would utilize duct banks to minimize the EMF and de-rated ampacity of conductors.
CPUC Decision D.93-11-013. Specifies CPUC requirements for reducing electric and magnetic fields.	**Yes.** The CPUC Commission required the utilities to undertake no-cost EMF mitigation measures and implement low-cost mitigation measures to the extent approved as part of a project's certification process. "Low-cost" was defined to be within the range of 4% of the total project cost but the Commission specified that this 4% benchmark is not an absolute cap.
CPUC Decision D.06-01-042. Re-affirms CPUC EMF Policy in D.93-11-013.	**Yes.** Re-affirms stated above requirement.
Title14, Cal. Code Regs., sections 1250-1258, "Fire Prevention Standards for Electric Utilities". Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.	**Yes.** The applicant would refer to the Fire Prevention Standards under 1250-1258. (design, construction, and operation phases).

TABLE 5.13-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis for Determination**
Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations". Specifies the guidelines for grounding-related practices within the ROW and substations.	**Yes.** Having a fence around the substation or switchyard and proper Transmission line clearance would facilitate a safety clearance zone. All the components of the substation or switchyard and fence would be grounded by utilizing the underground grounding grid. Maintain the proper ROW of the transmission paths, and substations to minimize the flashover and EMF effects.
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines. Specifies standard procedures for measuring electric power frequency electric and magnetic fields from an operating electric line.	**Yes.** The applicant would conduct the following tests. The first test is a corona performance test. The test uses visible techniques to determine the onset of positive corona. The second test is a radio interference voltage (RIV). The measurement of the RIV voltage according to ANSI C63.2 or CISPR 16-1-1 and CISPR TR 18-2.

Facility Closure

If the proposed Fountain Wind project were closed and decommissioned, and all related structures are removed as described in **Section 3, Project Description**, the minimal electric shocks and fire hazards from the physical presence of this gen-tie line would be eliminated. Decommissioning and removal would also eliminate the transmission lines' field and non-field impacts assessed in this analysis in terms of nuisance shocks, radio-frequency impacts, audible noise, electric and magnetic field exposure, and aviation safety. Since the lines would be designed and operated according to existing CPUC G.O.95 guidelines, these impacts would be as expected for PG&E lines of the same voltage and current-carrying capacity and therefore, at levels reflecting compliance with existing health and safety LORS.

5.13.4 Conclusions and Recommendations

CEC staff has identified the following conclusions and with the implementation of conditions of certification as detailed in subsection 5.13.5, the project would have a less than significant impact related to TLS&N and would conform with applicable LORS.

- The proposed generator tie-line would lie mainly within the boundaries of the Fountain Wind project's generator tie-line ROW and be maintained according to the standard procedures of the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) guidelines for line safety and field management. The lines would conform to all applicable laws, ordinances, regulations, and standards.

- Construction and operation of the Fountain Wind project's new collector feeders, generator tie-line, onsite substation and switchyard do not contribute to EMF levels, corona, audible noise, or radio and television interference, beyond acceptable standards.
- The long-term, mostly residential, magnetic exposure would be insignificant for the proposed generator tie-line given the absence of residences along the proposed route. On-site worker or public exposure would be short-term and at levels expected for PG&E lines of similar design and current-carrying capacity.
- The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current utility standards and guidelines.
- With the four proposed conditions of certification, any safety and nuisance impact from the construction and operation of the proposed substation, switchyard, collector feeders and gen-tie line would be less than significant.

5.13.5 Proposed Conditions of Certification

The following proposed conditions of certification include both measures to mitigate potential environmental impacts and ensure conformance with applicable LORS.

TLSN-1 The project owner shall construct the proposed 230-kV transmission lines, substation, collector feeders, and switchyard according to the requirements of California Public Utility Commission's GO- 95, GO-128, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and PG&E's EMF reduction guidelines.

Verification: At least 30 days prior to the start of construction of the transmission lines or related structures and facilities, the project owner shall submit to the compliance project manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ensure that the route of the proposed transmission lines is kept free of combustible material, as required under the provisions of GO-95 and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results, and any fire prevention activities carried out along the proposed route and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

TLSN-3 The project owner shall ensure that all permanent metallic objects within the proposed route are grounded according to industry standards.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

TLSN-4 The project owner shall measure the maximum strengths of the line electric and magnetic fields at the edge of the right-of-way to validate the estimates the applicant has provided for these fields. These measurements shall be made (a) according to the standard procedures of the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) and (b) before and after energizing. The measurements shall be completed no later than six months after the start of operations.

Verification: The project owner shall file copies of the pre- and post-energizing measurements with the CPM within 60 days after completion of the measurements.

TLSN-5 During construction, the project owner shall install lighting circuits simultaneously with installing turbines or transmission structures above 200 feet tall, consistent with the Federal Aviation Administration (FAA AC 70/7460-1M – Obstruction Marking and Lighting) requirements, thereby improving visibility for aviation safety.

Verification: At least 30 days before the construction of turbines or structures above 200 feet tall, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

5.13.6 References

EPRI – Electric Power Research Institute 1982. Transmission Line Reference Book: 345 kV and above.

FWPA TN248288-1 through TN 248288-18 - Fountain Wind Project Application (TN 248288-1 through TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA TN 248289-1 through TN 248289-3 - Fountain Wind Project Application (TN 248289-1 through TN 248289-3). Shasta County FEIR Vol.1, Vol.2, Appendices Part 3. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA TN 248290-1 through TN 248290-5 - Fountain Wind Project Application (TN 248290-1 through TN 248290-5). Application related filings. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

NIEHS 1998 – National Institute of Environmental Health Sciences (NIEHS) 1998. *An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields, Working Group Report*. Accessed online at: http://www.niehs.nih.gov/health/assets/docs_a_e/emf1.pdf

NIEHS 2024 – National Institute of Environmental Health Sciences (NIEHS) 2024, National Institute of Environmental Health Sciences: Electric & Magnetic Fields

World Health Organization (WHO) 2002, *Establishing a Dialogue on Risks from Electromagnetic Fields.* Accessed online at: Establishing a dialogue on risks from electromagnetic fields

World Health Organization (WHO), *Electromagnetic fields (EMF)*, Accessed online at: http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html

5.14 Transportation

5.14.1 Environmental Setting

Existing Conditions

The proposed project is located approximately 6 miles west of Burney, 35 miles northeast of Redding, and immediately north and south of State Route 299. The project site boundary encompasses approximately 2,855 acres within the 16,108-acre project area.

Descriptions of the roadways and highways likely to be utilized by vehicles travelling to/from the project site are provided below. For maps of the project site in relation to these roadways, see **Section 3, Project Description, Figure 3-1** and **Figure 3-2**.

Existing Local and Regional Transportation Network

Access to the project site is provided locally by SR 299, Moose Camp Road, as well as three existing, gated, private logging roads, and would be provided regionally by highways that provide access to SR 299, including Interstate 5, which is approximately 35 miles to the west of the project site, and SR 139, which is approximately 60 miles to the east of the project site.

Existing Bicycle, Pedestrian and Transit Facilities

There are no sidewalks or bicycle facilities that exist on roadways accessing the proposed project site or within the immediate study area.

The Redding Area Bus Authority (RABA) is the largest public transportation provider in Shasta County. Route 299X – Burney Express is provided by the County of Shasta Public Works Department and operated by RABA as part of an intergovernmental agreement. Route 299X mostly travels on SR 299 providing service between Burney and Redding. The following stops are provided:

- Burney (Burney Sporting Goods)
- Montgomery Creek (Montgomery Creek Library)
- Round Mountain (Round Mountain Store/Café)
- Bella Vista (My-T Fine Foods)
- Shasta College
- Redding (Downtown Transit Center)

Three daily (midweek only) round trips are provided. Westbound, the service begins at 5:50 AM in Burney with the last bus arriving in Redding at 5:15 PM. Eastbound, the service begins at 10:25 AM in Redding with the last bust arriving in Burney at 7:00 PM.

Regulatory

Laws, Ordinances, Regulations and Standards (LORS) related to transportation are summarized below. Details regarding all federal, state, and local LORS that apply to the project are included. Staff's analysis of project compliance with these LORS is presented in **Table 5.14-7**.

Federal

Code of Federal Regulations. The Code of Federal Regulations, Title 49, contains the federal rules and regulations pertaining to the transportation of goods and materials. Title 14 contains federal regulations pertaining to air transportation and aviation.

State

California Vehicle Code (CVC) and Streets and Highways Code. The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials, and right-of-way.

California State Planning Law. Government Code, Section 65302 requires that the project must conform to the General Plan.

Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides standards and guidelines for the design and usage of traffic control devices, such as signs, signals, and pavement markings, to ensure uniformity and consistency on roads and highways across the United States. It regulates construction-related signage and pavement delineation, offering guidelines for temporary traffic control in work zones. It ensures consistent and safe practices on roads during construction activities.

Local

Shasta County General Plan. The project is located within the unincorporated area of Shasta County. As such, the County's General Plan is relevant. Specifically, the general plan's Circulation Element specifies long-term planning objectives and policy related to quality and performance of transportation infrastructure within Shasta County. Shasta County's overall transportation goal is to develop a balanced, integrated, and diversified transportation system that addresses the regional needs (both urban and rural) of its citizens for a convenient, affordable, safe, and efficient multimodal transportation system to move goods and people.

Cumulative

Cumulative projects are identified as past projects, current projects, or reasonably foreseeable future projects that, when viewed in connection with the proposed project, cause its effect(s) on traffic and transportation to be potentially significant. A master list of cumulative projects located within the study area is provided in **Appendix 1, Table 1-2**. The following cumulative projects are relevant to Transportation:

- Diddy Roost Culverts (SR 299 Culvert Replacement)
- Ingot Curve Improvement (SR 299)
- Fenders Ferry Culverts (SR 299 Culvert Restoration)
- Potato Cut (SR 299 Curve Replacement)
- Burney CAPM Project (SR 299 Asphalt Overlay and Curb Ramp and Guardrail Upgrade)
- Burney Falls Pavement (SR 89 Pavement Rehabilitation)

These projects are planned, approved, or under construction and, given their physical proximity to the project area and potential to overlap the transportation routes used during construction, could potentially contribute to the same environmental effects as the proposed project.

5.14.2 Environmental Impacts

TRANSPORTATION Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b. Conflict or be inconsistent with CEQA Guidelines, section 15064.3, subdivision (b)?	☐	☐	☒	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☒	☐	☐
d. Result in inadequate emergency access?	☐	☐	☒	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, transportation.

5.14.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project.

Methodology

Level of Service Analysis

The operations of roadway facilities are described with the term “level of service” (LOS). LOS is a qualitative description of traffic flow from a vehicle driver’s perspective based

on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined, ranging from LOS A (free-flow conditions) to LOS F (over-capacity conditions). LOS E corresponds to operations "at capacity". When volumes exceed capacity, stop-and-go conditions result, and results are designated LOS F.

Roadway Segments

The LOS analysis evaluated the following ten segments of SR 299:

- I-5 to Hawley Road
- Hawley Road to Old Oregon Trail
- Old Oregon Trail to Deschutes Road
- Deschutes Road to Terry Mill Road
- Terry Mill Road to Big Bend Road
- Big Bend Road to West Access
- West Access to East Access
- East Access to Tamarack Road
- Tamarack Road to Elk Street
- Elm Street to Plumas Street

The roadway segment analysis applied the methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (HCM 6th) for vehicles. The analysis results present LOS and Volume-to-Capacity (V/C) ratio for each directional segment.

Unsignalized Intersections

The LOS analysis evaluated the following unsignalized project access intersections:

- SR 299 and West Access
- SR 299 and East Access

Traffic conditions at unsignalized (all-way stop-controlled and two-way stop-controlled) intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (HCM 6th) for vehicles. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, intersection control, lane geometry, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay for unsignalized intersections is summarized in **Table 5.14-1**. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection

average. For all-way stop-controlled intersections, average delay and highest movement/approach delay are reported.

TABLE 5.14-1 UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Control Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: Highway Capacity Manual 6th Edition (Transportation Research Board).

Staff used the LOS standards of Caltrans and the County of Shasta, described in the sections below, as significance thresholds to determine whether project-generated traffic's effects on LOS would create a conflict with the County's General Plan policy.

Vehicles Miles Travelled Analysis

Vehicle Miles of Travel (VMT) is a measure used to describe automobile use on a daily basis. VMT is the product of the total number of vehicles traveling and the number of miles traveled per vehicle. In December 2018, the Governor's Office of Planning and Research finalized new CEQA guidelines (CEQA Guidelines section 15064.3) that identify VMT as the most appropriate criterium to evaluate a project's transportation impacts. The implementation of Senate Bill (SB) 743 eliminated the use of criteria such as auto delay, LOS, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of CEQA compliance. The SB 743 VMT criteria promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In compliance with SB 743 mandates, VMT was employed to assess the environmental impacts of this project on the transportation network.

Thresholds of Significance

Shasta County General Plan Policies

The Circulation Element includes the following transportation policy that are applicable to the project:

- Policy C-6j: New development shall provide circulation improvements for emergency access by police, fire, and medical vehicles; and shall provide for escape by residents/occupants in accordance with the Fire Safety Standards.
- Policy C-6k: Shasta County shall adopt the following LOS standards for considering any new roads:
    - Rural arterial and collectors – LOS C
    - Urban/suburban arterial and collectors – LOS C

- Policy C-6l: New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated.
- Policy C-8b: Working in conjunction with Caltrans, the County shall designate and provide signed truck routes, ensure that adequate pavement depth, lane widths, loading areas, bridge capacities, vertical height of overpasses and utility lines, and turn radii are maintained on the designated truck routes, and prohibit commercial truck traffic from non-truck routes except for deliveries.

For the purposes of this assessment, directional segments, and intersections may be considered deficient when the addition of project-generated traffic causes a directional segment or intersection LOS to degrade to LOS D or worse.

Caltrans LOS Standards

Caltrans has identified a target LOS at the transition between LOS C and LOS D on state highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. For the purposes of this assessment, directional segments, and intersections on the state highway system (i.e., SR 299) may be considered deficient when the addition of project-generated traffic causes a directional segment or intersection LOS to degrade to LOS D or worse.

VMT Threshold

Shasta County has begun, but has not yet completed, consideration of transportation significance thresholds based on VMT. The County has not yet adopted VMT-based transportation significance thresholds. Where no VMT threshold has yet been adopted, the Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR 2018) provides guidance. In areas not near established or incorporated cities or towns, for example, the Technical Advisory notes that "significance thresholds may be best determined on a case-by-case basis." The County, based on its consideration of the potential timing for release of the Fountain Wind Project Draft EIR, determined that a significance threshold to evaluate VMT that would be generated by this project should be used to evaluate the potential transportation impacts of this project. For the purposes of establishing a VMT threshold for this project, the County considered CEQA Guidelines Sections 15064(b)(2) and 15064.7 regarding the development of thresholds of significance and has determined that a performance-based threshold consistent with the analysis of the significance of the project's greenhouse gas (GHG) emissions would be appropriate. Accordingly, for purposes of this project, an impact to VMT would be significant if it would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

5.14.2.2 Direct and Indirect Impacts

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Construction

Less Than Significant Impact. Based on the assessment, the addition of project-generated traffic during construction would not cause a substantial increase in traffic volumes within the transportation system affecting the efficiency of the transportation system, including transit, roadway, bicycle, and pedestrian facilities.

Additionally, any effect of project-generated traffic during construction would be temporary in nature and is not expected to result in any long-term impacts to the transportation system.

Therefore, the project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities, resulting in a less than significant impact.

Construction Trip Generation

The applicant reports an estimated 250-day construction period with construction activities occurring during the spring, summer, and fall. The project is estimated to employ a maximum of 199 employees per day during the peak period of construction. On an average day, construction activities are estimated to generate 398 trips with 149 trips (i.e., 75 percent of employees) arriving during the AM peak hour, and 80 (i.e., 40 percent of employees) departing the site during the PM peak hour. The remaining employee trips and heavy vehicle trips are assumed to arrive and depart outside of typical peak traffic hours. This assumption is consistent with a typical construction work force schedule.

The resultant construction trip generation estimates for daily, AM peak hour, and PM peak hour conditions are summarized below in **Table 5.14-2.**

TABLE 5.14-2 CONSTRUCTION TRIP GENERATION

Trip Type	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Construction	398	149	0	149	0	80	80

Construction Trip Distribution

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of regional project trip distribution were developed based on existing travel patterns, location of complementary land uses, and the origin of equipment and material for construction. The following assumptions were made regarding the distribution of trips to and from the project site:

- 60 percent of project trips would have an origin/destination west of the project site.
- 40 percent of project trips would have an origin/destination east of the project site.
- 56 percent of construction trips would use the West Access.
- 44 percent of construction trips would use the East Access.

Figure 5.14-1. Shows the AM and PM peak hour turning movement volumes at the SR 299/West Access and SR 299/East Access intersections.

Roadway LOS with Construction Traffic

AM and PM peak hour construction trip generation estimates were added to existing traffic volumes along study roadways to develop Existing Plus Construction Condition volumes. The results of the roadway LOS assessment for existing and with construction traffic scenarios are presented below in **Table 5.14-3** and **Table 5.14-4** for eastbound and westbound segments of SR 299, respectively. The assessment results indicate that all roadway segments are projected to operate acceptably (LOS C or better) with the addition of construction traffic.

TABLE 5.14-3 CONSTRUCTION CONDITION EASTBOUND SR 99 ROADWAY SEGMENT LOS RESULTS

Roadway	Segment		# of Lanes	Peak Hour Volume		Existing Conditions	Construction Conditions
	From	To		Existing	Existing Plus Construction	LOS C or better?	LOS C or better?
SR 299	I-5	Hawley Road	4	575	666	Yes	Yes
	Hawley Road	Old Oregon Trail	4	475	566	Yes	Yes
	Old Oregon Trail	Deschutes Road	2	260	351	Yes	Yes
	Deschutes Road	Terry Mill Road	2	130	221	Yes	Yes
	Terry Mill Road	Big Bend Road	2	135	226	Yes	Yes
	Big Bend Road	West Access	2	168	259	Yes	Yes
	West Access	East Access	2	168	259	Yes	Yes
	East Access	Tamarack Road	2	200	291	Yes	Yes
	Tamarack Road	Elk Street	2	180	271	Yes	Yes
	Elm Street	Plumas Street	2	435	526	Yes	Yes

Figure 5.14-1
Construction Peak Hour Volumes

Source: Fountain Wind Traffic Study_ 08082023_pt1 Figure 4

TABLE 5.14-4 CONSTRUCTION CONDITION WESTBOUND SR 99 ROADWAY SEGMENT LOS RESULTS							
Roadway	Segment		# of Lanes	Peak Hour Volume		Existing Conditions	Construction Conditions
	From	To		Existing	Existing Plus Construction	LOS C or better?	LOS C or better?
SR 299	I-5	Hawley Road	4	1100	1160	Yes	Yes
	Hawley Road	Old Oregon Trail	4	575	635	Yes	Yes
	Old Oregon Trail	Deschutes Road	2	455	515	Yes	Yes
	Deschutes Road	Terry Mill Road	2	130	190	Yes	Yes
	Terry Mill Road	Big Bend Road	2	135	195	Yes	Yes
	Big Bend Road	West Access	2	168	228	Yes	Yes
	West Access	East Access	2	168	228	Yes	Yes
	East Access	Tamarack Road	2	200	260	Yes	Yes
	Tamarack Road	Elk Street	2	185	245	Yes	Yes
	Elm Street	Plumas Street	2	180	240	Yes	Yes

Intersection LOS with Construction Traffic

AM and PM peak hour construction trip generation estimates were added to existing traffic volumes at study intersections to develop Existing Plus Construction Condition volumes, as shown on **Figure 5.14-1**. The results of the intersection LOS assessment for existing and with construction traffic scenarios are presented below in **Table 5.14-4**. The assessment results indicate that all study intersections are projected to operate acceptably (LOS C or better) with the addition of construction traffic.

TABLE 5.14-4 CONSTRUCTION CONDITION INTERSECTION LOS RESULTS				
Intersection	Traffic Control	Peak Hour	Construction Conditions	
			Delay (Seconds)	LOS
SR 299/West Access	TWSC	AM	7.7	A
		PM	10.1	B
SR 299/East Access	TWSC	AM	7.5	A
		PM	10.1	B

Operation

Less Than Significant Impact. Based on the assessment, the addition of project-generated traffic during project operations would not cause a substantial increase in traffic volumes within the transportation system affecting the efficiency of the transportation system, including transit, roadway, bicycle, and pedestrian facilities. Therefore, the project would not conflict with a program, plan, ordinance or policy

addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities, resulting in a less than significant impact.

Operation Trip Generation

The applicant reports an estimated maximum of 8 workers would be employed at the project site each working day, traveling to the site in 4 vehicles (i.e., a vehicle occupancy of 2 persons per vehicle). During operations, all trips are assumed to arrive in the AM peak hour and depart the project site during the PM peak hour.

The resultant operations trip generation estimates for daily, AM peak hour, and PM peak hour conditions are summarized below in **Table 5.14-6.**

TABLE 5.14-6 OPERATION TRIP GENERATION

Trip Type	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Operation	32	16	0	16	0	16	16

The operations vehicle trip generation estimates are lower than those for peak construction traffic, so the project's effects on traffic would be correspondingly lower.

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

As incorporated into section 10564.3, Public Resources Code section 21099 required changes to CEQA regarding the analysis of transportation impacts with direction that the criteria for determining the significance of transportation impacts promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. Consistent with this guidance, the analysis considers the project's VMT generation relative to its overall effect on GHG emissions.

Construction

Less Than Significant Impact. During project construction, daily trips made by workers and delivery/haul trucks to and from the project site would result in an increase in VMT and corresponding GHG emissions from transportation sources. However, this increase in VMT would be temporary in nature, only lasting the duration of the construction phase.

As documented in **Section 5.3, Climate Change and Greenhouse Gas Emissions**, the project would cause GHG emissions due to construction activities. Construction and eventual decommissioning activities would cause GHG emissions resulting from fossil-fuel combustion in the engines of construction equipment and the vehicles carrying construction materials and workers to and from the site. The project applicant reports an estimated 6,606,171 total VMT during construction, which would equate to approximately 9,810 MTCO2e over the two-year period of construction, including site preparation, grading, and on-and-off-site construction (Stantec 2023aq: TN 250273).

Annualized, overall construction GHG emissions would be equivalent to a rate of 327 MTCO2e/year.

However, some of the renewable power generated by the proposed project would displace power produced by carbon-based fuels that would otherwise be used to meet electricity demand. The power displaced is incremental power provided by generators elsewhere on the grid, typically from natural gas power plants. While the precise quantity of GHG emissions avoided by the proposed project would depend on the operations, the project would result in the avoidance of over 214,000 million metric tons of CO2-equivalent (MTCO2e) per year during operations, which incorporates GHG emissions resulting from the following sources:

- Operations & Maintenance Trips
- Emergency Generator Testing
- Operations & Maintenance Building Electricity Use and Solid Waste
- Operations & Maintenance Cranes and Mowers
- Water Use
- Fugitive SF_6 Emissions
- Effects of Land Use Conversion

The emissions avoided would offset the combined effects of emissions from operations and construction that is estimated at 2,621 MTC02e/year. Consequently, the proposed project would not result in any net additional GHG emissions. The combined direct and indirect effects of the emissions quantified indicate that a net GHG reduction would occur primarily due to the emissions avoided by producing electricity from renewable energy.

Therefore, the proposed project's effect on VMT during construction would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) and is considered a less than significant impact.

Operation

Less Than Significant Impact. During Project operation, daily trips made by workers and delivery/haul trucks to and from the project site would result in an increase in VMT. However, this increase in VMT and associated GHG emissions would be offset by emissions avoided by producing electricity from renewable energy.

As documented in **Section 5.3, Climate Change and Greenhouse Gas Emissions**, the proposed project would cause GHG emissions due to activities during project operation. Operation of the proposed project would cause GHG emissions from the following types of activities: worker motor vehicle trips; emergency generator testing; energy use (electricity) for the O&M building; cranes used to access turbines for maintenance work; mowers used for maintenance; the electricity intensity of the O&M

water supply; solid waste disposal; and SF_6 leaked from circuit breakers at the proposed substation site. The project applicant reports an estimated 340 VMT/day post construction for operations, which would equate to approximately 137 MTCO2e/year.

However, some of the renewable power generated by the proposed project would displace power produced by carbon-based fuels that would otherwise be used to meet electricity demand. The power displaced is incremental power provided by generators elsewhere on the grid, typically from natural gas power plants. While the precise quantity of GHG emissions avoided by the proposed project would depend on the operations, the project would result in the avoidance of over 214,000 MTCO2e per year, which incorporates GHG emissions resulting from the following sources:

- Operations & Maintenance Trips
- Emergency Generator Testing
- Operations & Maintenance Building Electricity Use and Solid Waste
- Operations & Maintenance Cranes and Mowers
- Water Use
- Fugitive SF_6 Emissions
- Effects of Land Use Conversion

The emissions avoided would offset the combined effects of emissions from operations and construction that is estimated at 2,621 MTC02e/year. Consequently, the proposed project would not result in any net additional GHG emissions. The combined direct and indirect effects of the emissions quantified indicate that a net GHG reduction would occur primarily due to the emissions avoided by producing electricity from renewable energy.

Therefore, the proposed project's effect on VMT during operation would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) and is considered a less than significant impact.

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction and Operation (Access)

Less Than Significant with Mitigation Incorporated. The project would gain access to SR 299 at two locations, the SR 299/West Access (Postmile 62.3) intersection and SR 299/East Access (Postmile 67.3) intersection. The west access is located on the inside of a curve on SR 299. A sight distance evaluation at the project access intersections identified inadequate sight distance (i.e., obstructions) at the SR 299/West Access intersection for vehicle making a northbound left-turn (i.e., egress) movement.

Construction and Operation (Goods Movement)

Less Than Significant with Mitigation Incorporated. The project could, unless mitigated, substantially increase hazards to vehicles, bicyclists, and pedestrians traveling on the state highway system, including SR 299, due to the proposed use of oversize/overweight vehicles. During construction and decommissioning, heavy construction equipment and wind turbine components (e.g., wind turbine blades) would be delivered to the project site using area roadways, which may require transport by oversize/overweight vehicles. Consistent with California Vehicle Code Sections 35780 – 35796, transport of oversize/overweight vehicles would require mandatory permits from Caltrans, including Variance Permits for all loads over 15 feet in width, over 17 feet in height, or over 135 feet in length.

Applicant-Proposed Mitigation (Access). The applicant has proposed that the project be required to prepare a construction traffic management plan, in response to the potential effect that heavy vehicle trips generated by the project would have on the existing roadway network and measures to ensure safe ingress and egress at the project access intersections. Staff has incorporated the applicant's proposed mitigation into Condition of Certification (COC) **TRANS-1**, to ensure conformance with applicable LORS.

Applicant-Proposed Mitigation (Goods Movement). The applicant is required to obtain all mandatory permits from Caltrans and other relevant jurisdictions, required for the transport of materials to the project that exceed weight, height, and length limits, including any limitations imposed on the movement of such material. Staff has incorporated the applicant's proposed mitigation into COC **TRANS-3**, to ensure conformance with applicable LORS.

d. Would the project result in inadequate emergency access?

Construction

Less Than Significant Impact. Emergency vehicles would maintain right-of-way over construction vehicles. Construction activities would not prevent access for emergency vehicles. The addition of project-generated traffic during construction along study roadways and at study intersections would have a negligible effect on emergency vehicles, as all vehicles are required to yield to emergency response vehicles.

Operation

Less Than Significant Impact. Emergency vehicles would maintain right-of-way over vehicles. Operational activities would not prevent access for emergency vehicles. The addition of project-generated traffic during normal operations along study roadways and at study intersections would have a negligible effect on emergency vehicles, as all vehicles are required to yield to emergency response vehicles.

5.14.2.3 Cumulative Impacts

Less Than Significant Impact. The State CEQA Guidelines indicate that the impact analysis for GHG emissions is global in nature, and the focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. The discussion of "Existing Conditions" (subsection 5.3.1.1) discloses the broader context of global climate change and provides information on statewide and local emissions.

The Cumulative Project Scenario and a list of cumulative projects appears in **Appendix 1, Table 1-2**. Past, present, and reasonably foreseeable probable future GHG emissions could be attributable to each of the cumulative projects, especially those that involve construction activities or operation and maintenance activities that involve use of fossil fuels.

The focus of this analysis is to disclose the project's effect on climate change, while presenting the quantity of GHG emissions, including those by mobile sources. The State CEQA Guidelines provide that a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be significant and the effects of the project to not be cumulatively considerable if the project complies with the requirements of the state's long-term climate goals or strategies.

The proposed wind energy generation facility would lead to a net reduction in GHG emissions across the State's electricity system, and the GHG emissions related to the project would not conflict with any plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs. Therefore, the project's GHG emissions would not be cumulatively considerable.

5.14.3 Project Conformance with Applicable LORS

Table 5.14-7 contains staff's determination of conformance with applicable federal, state, and local LORS, including any proposed COCs, where applicable, to ensure the project would comply with LORS. As shown in this table, staff concludes that with implementation of specific COCs, the proposed project would be consistent with all applicable LORS. The subsection below, "Staff Proposed Conditions of Certification," contains the full text of the referenced COCs.

TABLE 5.14-7 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basics for Determination
Federal	
Code of Federal Regulations	
Title 49 CFR, Subtitle B, Sections 171-177, 350-399, and 397.4 Requires proper handling and storage of hazardous materials during transportation.	**Yes.** The project and transportation would align with all established standards for the transportation of hazardous materials. See **TRANS-2**.
Title 14 CFR, Part 77, Section 77.9 Requires notification of the Federal Aviation Administration	**Yes.** The project has received determinations of no hazard to air navigation from the FAA for the

TABLE 5.14-7 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basics for Determination**
(FAA) of any construction or alterations exceeding 200 feet above ground level. Also requires FAA notification of any construction or alteration of greater height than an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 feet in length.	wind turbines, which would exceed 200 feet above ground level. (FWPA, TN 248290-4)
State	
California Vehicle Code (CVC) and Streets and Highways Code	
CVC Sections 13369, 15275 and 15278 Addresses the licensing of drivers and classifications of licenses required for the operation of particular types of vehicles. In addition, certificates permitting the operation of vehicles transporting hazardous materials are required.	**Yes.** The project would follow the guidelines specified in these sections of the CVC. See **TRANS-3**.
CVC Section 25160 et seq. Addresses the safe transport of hazardous materials.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.
CVC Sections 2500-2505 Authorizes the issuance of licenses by the Commissioner of the CHP for the transportation of hazardous materials including explosives.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.
CVC Section 31300 et seq. Requires transporters to meet proper storage and handling standards for transporting hazardous materials on public roads.	**Yes.** Transporters would comply with standards for the transportation of hazardous materials on state highways throughout construction and operations. State Emergency Response Commission (SERC) would ensure adherence to CVC Section 31303, mandating that shippers of hazardous materials opt for the shortest route possible to and from the site.
CVC Sections 31600 - 31620 Regulates the transportation of explosive materials.	**Yes.** The project would conform to CVC Sections 31600 – 31620.
CVC Sections 32000 - 32053 Regulates the licensing of carriers of hazardous materials and includes noticing requirements.	**Yes.** The project would conform to CVC Sections 31600 – 31620.
CVC Sections 32100 - 32109 and 32105 Establishes special requirements for the transportation of substances presenting inhalation hazard and poisonous gases and require that shippers of inhalation or explosive materials contact the CHP and apply for a Hazardous Material Transportation License.	**Yes.** The project would comply by mandating shippers of inhalation or explosive materials to reach out to the CHP and secure a Hazardous Materials Transportation License.
CVC Sections 34000 - 34121 Establishes special requirements for the transportation of flammable and combustible fluids over public roads and highways.	**Yes.** The project would conform to CVC Sections 34000 – 34121.
CVC Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5–7, 34506, 34507.5 and 34510–11 Regulates the safe operation of	**Yes.** The project would follow the guidelines specified in these sections of the CVC.

TABLE 5.14-7 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basics for Determination**
vehicles, including those used to transport hazardous materials.	
CVC Sections 35780 Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.	**Yes.** Transporters would secure transportation permits for all overloads, as mandated.
CVC Sections 35550 - 35559 Regulates weight and load limitations.	**Yes.** The project would follow the guidelines specified in these sections of the CVC.
California Streets and Highways Code	
S&HC Sections 660, 670, 1450, 1460 et seq., 1470, and 1480 Regulates right-of-way encroachment and the granting of permits for encroachments on State and County roads.	**Yes.** The project would follow the guidelines specified in these sections of the S&HC.
S&HC Sections 117, 660 - 711 Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery.	**Yes.** Encroachment permits would be obtained by transporters, as required.
S&HC Sections 660 - 711 Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.	**Yes.** Transportation permits would be obtained by transporters for all overloads, as required.
California State Planning Law	
Government Code, Section 65302 Requires that the Project must conform to the General Plan.	**Yes.** The project would align with the provisions of the Shasta County General Plan.
Local	
Shasta County General Plan	
Circulation Element Specifies long-term planning goals and procedures for transportation infrastructure system quality within Shasta County.	**Yes.** The project would be consistent with the policy of the Shasta County General Plan Circulation Element.

5.14.4 Conclusions and Recommendations

As discussed above, with implementation of COCs, the project would have a less than significant impact related to transportation and would conform with applicable LORS. Staff recommends adopting the COCs as detailed in subsection “5.14.5 Proposed Conditions of Certification” below.

5.14.5 Proposed Conditions of Certification

The following proposed conditions of certification include measures to ensure conformance with applicable LORS.

TRANS-1 Prior to the start of construction, the project owner shall prepare a Construction Traffic Management Plan (CTMP). The CTMP shall address the movement of workers, vehicles, equipment, and materials, including arrival and departure schedules, carpooling, a parking/staging plan, and designated workforce and delivery routes. Traffic control plans shall be prepared as necessary to address construction staging, as well as any roadway or lane

closures and shall include any signage or roadway lighting improvements deemed necessary during construction. The CTMP shall address means of access for emergency vehicles to the project site, as well as means of maintaining access to any adjacent residential and commercial property during the construction and maintenance of the project.

The CTMP shall include procedures to restore damage to existing roadways caused by project construction traffic. The construction contractor shall work with Shasta County and Caltrans to prepare a schedule and mitigation plan for the roadways along construction routes, in accordance with the procedures established by the CTMP.

The CTMP shall include measures to ensure safe ingress and egress at the project access intersections. Measures may include removal of vegetation to provide unobstructed line of sight, addition of advanced warning signs, and active work zone traffic control/traffic management following as approved by Caltrans.

Verification: At least 60 calendar days prior to the start of construction, the project owner shall submit the CTMP to Caltrans, Shasta County, and California Highway Patrol (CHP) for review and comment and to the compliance project manager (CPM) for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to Caltrans, Shasta County, and CHP requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from Caltrans, Shasta County, CHP, or any other interested agencies, along with any changes to the CTMP, for CPM review and approval. After CPM review and approval, the project owner shall provide completed copies of the final CTMP to Caltrans, Shasta County, CHP, and any other interested agencies, sending copies of the correspondence to the CPM.

TRANS-2 The project owner shall ensure that permits and/or licenses are secured from the relevant administering agency, including CHP and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its Monthly Compliance Reports (MCR's) copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-3 The project owner shall comply with limitations imposed by Caltrans and other relevant jurisdictions, on vehicle sizes, weights, driver licensing, and truck routes.

Verification: The project owner shall retain copies of permits and supporting documents on-site for CPM inspection if requested.

5.14.6 References

FWPA – Fountain Wind Project Application (TN 248290-4). FAA Determination of No Hazard, dated January 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249636). Laws, Ordinances, Regulations, and Standards Consistency Matrix; dated April 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 249635). General Plan Consistency Matrix, dated April 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

OPR 2018 – Office of Planning and Research. "TECHNICAL ADVISORY - ON EVALUATING TRANSPORTATION IMPACTS IN CEQA." Adopted December 2018. Accessed on: November 5, 2023. Accessed online at: https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

Stantec 2024o (TN 254771). Fountain Wind Traffic Study, dated March 1, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024j (TN 254350). Responses to Post-Scoping Data Requests, dated February 6, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024i (TN 254349). Traffic Safety Memorandum Appendix B, dated February 6, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024i (TN 256388). Fountain Wind Project – Traffic Study (responses to comments for TN 254771), dated May 15, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

TRB 2016 – Transportation Research Board (TRB). "Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis, 2016." Accessed on: July 26, 2024. Accessed online at: http://hcmvolume4.org/Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis | Publications

5.15 Visual Resources

5.15.1 Environmental Setting

The proposed project would be constructed on 2,855 acres of forestland managed for timber production in the southern tip of the Shasta Cascade in Shasta County, California. The project site is about five miles south of Hatchet Mountain, north of Lookout Mountain and Snow Mountain, and includes the east side of Fuller Mountain, Fauries Peak, Carberry Mountain, and the west side of Ward Butte. California State Route (SR) 299, an east-west highway that traverses the area is to the west, north, and east of the project site. Hatchet Creek and Carberry Creek parallel the highway for a part. Montgomery Creek, a census-designated place, population 176, and Round Mountain another census-designated place, population 160 are both about three miles to the west, and the unincorporated town of Burney, population 3,000, seven miles to the east. The city of Redding is 30 miles to the southwest. Shasta-Trinity National Forest is to the north and west, Lassen National Forest is to the east and south, and the LaTour Demonstration State Forest to the southeast.

Regulatory

Federal, state, and local government laws, ordinances, regulations, and standards (LORS) relating to aesthetics and visual resources applicable to the proposed project and project site are set forth below.[1]

Federal

Federal Aviation Administration–Obstruction Marking and Lighting. Federal Aviation Administration Advisory Circular (AC) No. 70/7460-1M Obstruction Marking and Lighting provides standards for marking and lighting structures to promote aviation safety. Recommendations for lighting structures can vary, depending on terrain features, weather patterns, geographic location, and number of structures.

State

California Scenic Highway Program. The California Scenic Highway Program was established by the Legislature as Article 2.5 (commencing with section 260) of the Streets and Highways Code. The purpose of the program is to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment.

Section 263 of the Streets and Highways Code, the "State Scenic Highway System List" provides a list of highways that have been either officially designated or are eligible for

1 Pub. Res. Code § 25525, the California Energy Commission may not certify a facility if it does not conform with any applicable state, local, or regional laws, ordinances, regulations, and standards (LORS), "unless the commission determines that the facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving public convenience and necessity."

designation as a State scenic highway. The project site is not shown along a designated State scenic highway. The list shows only one designated State scenic highway in Shasta County. A 3.3-mile segment of State Route 151 (SR-151) extending south from Shasta Dam. This segment is approximately 28 miles from the western edge of the project site.

There are no eligible or designated State scenic highways within a 10-mile viewshed radius of the project. Eligible state scenic highways located beyond the 10-mile viewshed radius include: SR-89 from the Siskiyou County border to its intersection with SR-44. SR-89 is designated a "Volcanic Legacy Scenic Byway" and an "All-American Road." SR-89 at its closest point from the project site is approximately 11 miles. (Caltrans 2024)

Local

Shasta County General Plan

The primary purpose of the General Plan is to identify the goals, policies, and standards of the General Plan that will guide the physical growth of Shasta County. The project site according to General Plan Figure Pre-3 Planning Area Boundaries is in the "EastFor" Area.

The Shasta County General Plan shows the land use designation on the project site is "Timberland" or (T). The Timberland general plan designation, objectives, and policies applicable to the project and to visual resources are described below.

Shasta County General Plan, Timberlands Element

> "The Shasta County Timberlands Element is a combination of planning requirements from the mandated Land Use, Conservation, and Open Space Elements. Portions of these mandatory elements relevant to timberlands are cited below.
>
> A land use element which designates the proposed general distribution and general location and extent of the use of land for...natural resources... The diagram for the land use element shall designate those parcels of real property for timberland production which have been so zoned pursuant to the California Timberland Productivity Act of 1982, Chapter 6.7 (commencing with Section 51100) of Part 1 of Division 1 of Title 5 (Government Code Section 65302(a)).
>
> A conservation element for the conservation, development and utilization of natural resources including...forests...the conservation element may also cover...protection of watersheds.... (Government Code Section 64302(d)).
>
> Open space for the managed production of resources, including...forest lands.... (Government Code Section 65560(b)(2)).

Parcels zoned as timberland preserve shall be zoned so as to restrict their use to growing and harvesting and to compatible uses and shall be entered as a timber preserve element of the County General Plan. (Government Code Section 51115).

Forest management is the application of business methods and forestry principles to the operation of a forest property for the purpose of maintaining forest resources and producing a continuous supply of forest products. Forest management is based on sound silviculture practices. Silviculture is the theory and practice of controlling the establishment, composition, and growth of forests. The State Forest Practice Rules defines a "silvicultural system" as a planned program of forest stand treatments during the life of a stand. It consists of a number of integrated steps conducted in logical sequence leading to or maintaining a forest of distinctive forms for the level of management intensity desired, which includes, but are not limited to, site preparation, planting, harvesting, road construction, insect and disease control, inventory, and fire protection.

Land dedicated to commercial forest management provides not only building materials, energy for industrial processes, firewood, County revenue for roads and schools, and employment opportunities, but also wildlife habitat, recreational opportunities, aesthetic enjoyment, and watershed. Maintaining timber operations and preservation of valuable timberlands are important to the economic base and the natural resource values of Shasta County. The Timberlands Element, therefore, relates present and future uses of timberlands to the natural resource, economic, and community development plans for Shasta County." (Shasta County General Plan, Timberlands Element, p. 6.2.01)

6.2.3 Objectives

T-1 Preservation of timberlands suitable for forest management and production to allow for the continuation of such uses or to provide opportunities for the future establishment of such uses.

T-2 Protection of timberlands from incompatible adjacent land uses which adversely impact forest management activities.

6.2.4 Policies

T-a Preservation of timberland shall be achieved by the use of the Timberlands land use designation. This designation shall be applied to lands as follows:

- Lands now within a Timber Production Zone (TPZ) in accordance with the Forest Taxation Reform Act (hereinafter Act).
- Lands which may be eligible to enter into a TPZ in accordance with the Act.
- Lands not contained within either of the above categories which are suitable for timber production as shown on the adopted land use maps.

- Timber producing lands which are sold or traded to a private landowner by a federal or state agency.

T-b Timberlands within a TPZ shall be regulated as to use and subdivision as set forth in the Act. In addition to the permitted uses listed in the Act, other related and compatible uses may be conditionally permitted under applicable provisions of the Zoning Plan.

T-c Timberlands submitted for entrance into a TPZ in accordance with the Act shall be comprised of single or contiguous parcels whose resource value(s) and size(s) comply with Table T-3." (Shasta County General Plan, Timberlands Element, pp. 6.2.05 to 6.2.06)

Shasta County General Plan, Scenic Highways Element

The Scenic Highways Element of the Shasta County General Plan is intended to establish and protect highways with scenic value, be they State or County roads.

Definitions

The term 'scenic highway,' as used in this element, refers to any freeway, highway, road, street, or boulevard ... that traverses an area of unusual scenic quality as indicated on Figure SH-1. ...

The visible land area outside the actual right-of-way is generally described as the 'viewshed' or the 'scenic corridor. The corridor encompasses the land easily visible from the highway. Depending on topography and air quality, the physical dimensions of the corridor may vary considerably.

It is the visual quality of the man-made or natural environments within a scenic corridor that are responsible for its scenic value. Commonly, the physical limits of a scenic corridor are broken down into foreground views (zero to one quarter mile) and distant views (over one quarter mile). In addition to distinct foreground and distant views, the visual quality of a scenic corridor is defined by special features, which include:

- Focal points - prominent natural or man-made features which immediately catch the eye.
- Transition areas - locations where the visual environment changes dramatically.
- Gateways - locations which mark the entrance to a community or geographic area." (Shasta County General Plan, Scenic Highways Element, p. 6.8.01)

The Shasta County scenic highways map (Figure SH-1) identifies scenic highways and special features. The summit of Hatchet Ridge[2] on SR-299 is designated a

2 Hatchet Ridge is a long, broad north-south ridgeline in the southern Shasta Cascade Mountains that leads up to the summit of Hatchet Mountain (5,450 feet elevation) about three miles north of SR-299, east of Moose Camp Road.

"Gateway." SR-299 from Bella Vista to the summit of Hatchet Ridge is shown as a "Corridor In Which Natural Environment Is Dominant." SR-299 from the summit of Hatchet Ridge to Burney is shown as a "Corridor In Which Natural And Man-Made Environment Contrast." (Shasta County General Plan, Scenic Highways Element, p. 6.8.04)

Value of Scenic Corridors

Scenic corridors make major contributions to the quality of life enjoyed by the residents of Shasta County. The development of community pride, the enhancement of property values, and the protection of aesthetically-pleasing open spaces reflecting a preference for the rural lifestyle are all ways in which scenic corridors are valuable to County residents.

Scenic highways and their associated corridors also strengthen the tourist industry of Shasta County. For many visitors, highway corridors will provide their only experience of Shasta County. Enhancement and protection of these corridors ensures that the tourist experience continues to be a positive one and, consequently, provides support for the tourist-related activities of the County's economy.

Scenic Corridor Issues

In order to ensure present and future protection of the County's scenic environment, unsightly land uses which impair the visual quality of official scenic highways should be controlled. Undesirable land uses might include construction of large buildings or facilities, various types of large unscreened outdoor storage areas, non-landscaped parking lots, and the siting of billboards or other off-premise signs. These activities tend to conflict with the surrounding natural environment and restrict views of distant features such as mountains and lakes.

Shasta County is fortunate in that current land uses along its scenic highways rarely conflict with the visual quality of associated corridors. This is largely due to the fact that current preferences for the rural lifestyle in many areas of the County have resulted in a development pattern which for the most part respects natural features and landscapes. ....

Future impact of development on visual resources along official scenic highways will depend primarily upon decisions regarding the type, design, and siting of future land uses. The General Plan should therefore provide for the continued protection and enhancement of official scenic highways."

(Shasta County General Plan, Scenic Highways Element, pp. 6.8.01 to 6.8.02)

6.8.4 Policies

SH-a To protect the value of the natural and scenic character of the official scenic highway corridors and the County gateways dominated by the natural

environment, the following provisions, along with the County development standards, shall govern new development:

- setback requirements
- regulations of building form, material, and color
- landscaping with native vegetation, where possible
- minimizing grading and cut and fill activities
- requiring use of adequate erosion and sediment control programs
- siting of new structures to minimize visual impacts from highway
- regulation of the type, size, and location of advertising signs
- utility lines shall be underground wherever possible; where undergrounding is not practical, lines should be sited in a manner which minimizes their visual intrusion."

  (Shasta County General Plan, Scenic Highways Element, pp. 6.8.05 to 6.8.06)

Shasta County Ordinances

The Shasta County zoning map shows the project site in the TP (Timber Production) Zone. Shasta County Ordinances, Title 17, Chapter 17.08 states the purpose and application of this zone district is as follows:

"The purpose of the timber production (TP) district is to preserve lands devoted to and used for the growing and harvesting of timber, that meet the requirements of the California Timberland Productivity Act of 1982, and to provide for uses compatible with the growing and harvesting of timber. The TP district is equivalent to the timberland production zone referred to in the act. Land within a TP district is subject to all conditions and restrictions applicable to a timberland production zone. This district is consistent with the timberland (T) general plan designation, and may also be applied to other areas which meet the criteria of this district, provided there are no conflicts with other general plan policies." (Shasta County Ordinances, Title 17, Chapter 17.08, section 17.08.010)

It should be noted the TP zoning on the project site does not show the proposed project as a use permitted under section 17.08.020, or a use granted by a use permit under section 17.08.030.

Shasta County Ordinances, Title 17, Chapter 17.84 – General Development Standards regarding transmission lines height limit-exceptions states:

> "3. Transmission Lines. Height limitations provided in this title shall not apply to electric transmission lines or towers." (Shasta County Ordinances, Title 17, Chapter 17.84, section 17.84.030)

Shasta County Ordinances, Title 17, Chapter 17.84 – General Development Standards regarding lighting states the following:

> "All lighting, exterior and interior, shall be designed and located so as to confine direct lighting to the premises. A light source shall not shine upon or illuminate directly on any surface other than the area required to be lighted. No lighting shall be of the type or in a location such that constitutes a hazard to vehicular traffic, either on private property or on abutting streets." (Shasta County Ordinances, Title 17, Chapter 17.84, section 17.84.050)

Cumulative

Appendix 1 provides a list of the past, present, and reasonably foreseeable projects that may be relevant for a cumulative analysis for the proposed project. **Table 1-2** provides a list of applicable cumulative projects and **Figure 1-1** shows the locations of these projects relative to the proposed project. Impacts pertaining to aesthetics/visual resources from some of these projects could potentially combine with impacts by the Fountain Wind Project causing a significant cumulative impact. The California Energy Commission staff (staff) used a geographical scope involving a five-mile radius[3] from the project site for this cumulative analysis. The projects identified and their **Table 1-1** Map ID # are the following:

14 Diddy Roost Culverts project involves replacing 26 culvert systems and upgrades 20 drainage inlets along the SR-299. Five miles west of the project site. Caltrans project.

16 Fenders Ferry Culverts project involves culvert restoration at six locations on SR-299. Five miles west of the project site. Caltrans project.

17 Potato Cut is a proposed roadway curve improvement, and paving for roads and highway on and along SR-299 north of Montgomery Creek. Three miles west of the project site. Caltrans project.

19 Hatchet Ridge Wind, 44 wind turbines generating approximately 101 megawatts. It began commercial operation in 2010. One mile east of the project site. Pattern Energy.

20 Burney Capital Preventive Maintenance Project includes an asphalt overlay, upgrading curb ramps and guardrail to current standards, and drainage work project on SR-299. Six miles northeast of the project site. Caltrans project.

3 The distance zone surrounding the project may vary depending on the project size. "Based on the curve of the Earth: Standing on a flat surface with your eyes about 5 feet off the ground, the farthest edge that you can see is about 3 miles away." (Roland 2019) However, visual impact assessments performed by the U.S. Department of Agriculture Forest Service and the U.S. Department of Interior Bureau of Land Management employ greater distances. California Energy Commission staff typically use a three to five-mile distance zone surrounding the project site.

26 Crossroads 2 is a proposed 313-megawatt battery storage facility on an 85-acre site south of Montgomery Creek. Three miles west of the project site. NextEra Energy project.

5.15.2 Environmental Impacts

AESTHETICS Except as provided in Public Resources Code Section 21099[4], would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐	☐	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

California Code of Regulations, Title 14, Division 6, Chapter 3, Article 20 Appendix G Environmental Checklist Form, I. Aesthetics as amended December 28, 2018.

In accordance with Public Resource Code section 21099, staff has determined the project is not an employment center project on an infill site within a transit priority area. A transit priority area is an area within a half mile (2,640 feet) of a major transit stop. Staff viewed current Google Earth aerial and street view imagery and found no major transit stop in the vicinity.

5.15.2.1 Methodology and Thresholds of Significance

The California Energy Commission evaluates a proposed project in accordance with the California Environmental Quality Act (CEQA) codified in California Public Resources Code (Pub. Res. Code) section (§) 21000 et seq., and the Guidelines for the Implementation of the California Environmental Quality Act (CEQA Guidelines) codified in the California Code of Regulations (CCR), Title 14 § 15000 et seq.

4 Public Resources Code section 21099 asks is the proposed project an “employment center project” on an “infill site” within a “transit priority area” as defined in this section. A transit priority area is an area within a half mile (2,640 feet) of a major transit stop existing or planned. Public Resources Code section 21099(d)(1) states, “Aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment.”

CEQA, states "'Environment' means the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance [emphasis added]" (Pub. Res. Code § 21060.5)

The CEQA Guidelines state "Effects analyzed under CEQA must be related to a physical change." (14 CCR § 15358[b])

The CEQA Guidelines also state a "'Significant effect on the environment' means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance [emphasis added]." (14 CCR § 15382)[5]

"The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area." (14 CCR § 15064[b][1])

The California Energy Commission must assess "… the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency [6] determines whether an impact is significant." (14 CCR § 15125[a])

Object of Aesthetic Significance

An exact definition of an "object of aesthetic significance" is not provided in CEQA or the CEQA Guidelines. For the purpose of this analyses, an object of aesthetic significance can be explained as an object subjectively designated by the federal, state, or local government and unique to it. Also, an undesignated but popularly used or appreciated area or object of aesthetic claim of significance is considered within the definition. A tour book guide and road atlas of the area (e.g., AAA, Rand McNally) and Wikipedia are helpful. A lead agency may look to local planning thresholds when defining the visual impact standard for the purpose of CEQA[7] (e.g., general plan, specific plan, zoning). A few often-designated objects of aesthetic significance at the national, state, and local government levels have included:

- A geographic feature; geologic distinguishing characteristic, geomorphologic feature.
- A structure that embodies elements of architecture or engineering design, detail, materials or craftsmanship that represent a significant innovation or is unique.

5 In addition to 14 CCR § 15382 also stated in 14 CCR § 15360 and Public Resources Code § 21060.5.
6 "'Lead agency' means the public agency which has the principal responsibility for carrying out or approving a project." (14 CCR § 15367)
7 *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App. 4th 477.

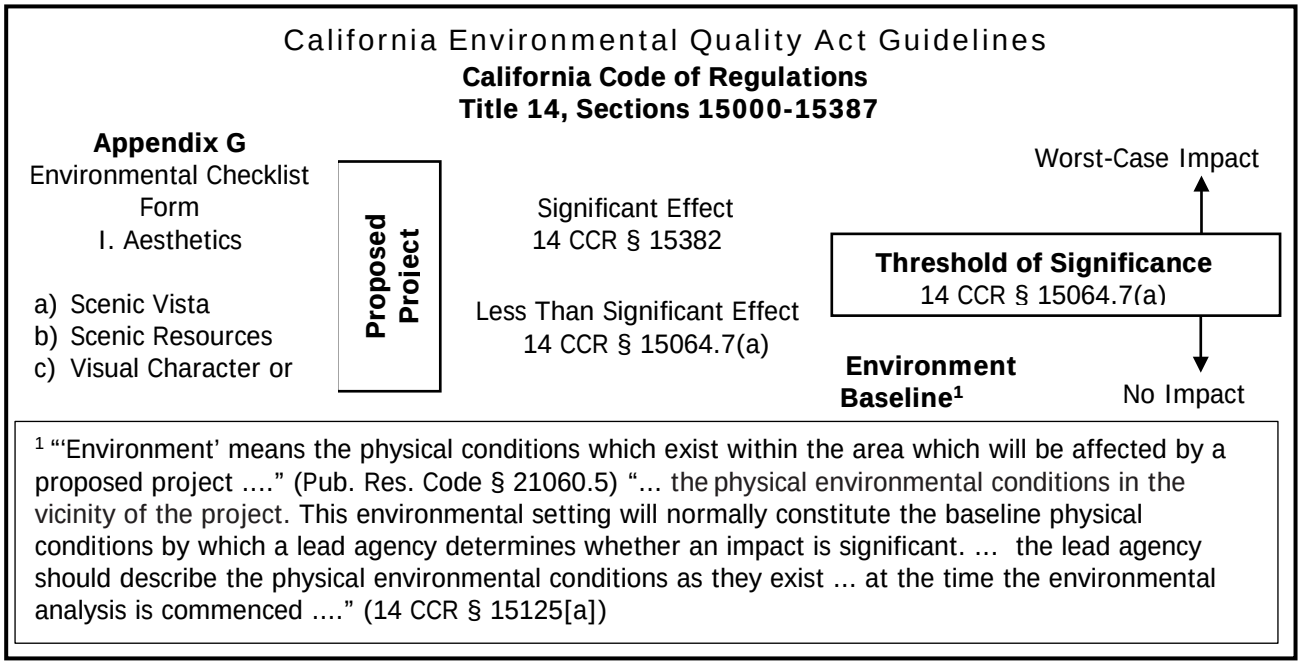
- A structure of unusual historical and usually aesthetic interest.
- A tree or group of trees recognized for their aesthetic, botanical, and ecological value, and/or age, rarity, and size.
- A landscape architecture or designed landscape.

The potential physical change by the proposed project to an existing object of aesthetic significance in the area and the existing physical environment is what is analyzed.

Environmental Factor – Aesthetics

The CEQA Guidelines *Appendix G Environmental Checklist Form, I. Aesthetics* supplies questions (criteria) to answer when evaluating if a proposed project has a significant effect on the environment involving the environmental factor "Aesthetics" (shown in the table above). Staff uses these questions in this analysis. Explanations and responses to them are presented under the subheadings Scenic Vista, Scenic Resources, Visual Character or Quality of Public View of Site and its Surroundings, and Light and Glare.

"An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency ... is to be reviewed in the light of what is reasonably feasible .... The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure." (14 CCR § 15151)



Threshold of Significance

The CEQA Guidelines define a *threshold of significance* as "an identifiable quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less

than significant." (14 CCR § 15064.7[a]) See CEQA Guidelines Level Of Effect On The Environment table below.

"Thresholds of significance ... may assist lead agencies in determining whether a project may cause a significant impact. When using a threshold, the lead agency should briefly explain how compliance with the threshold means that the project's impacts are less than significant. Compliance with the threshold does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's environmental effects may still be significant." (14 CCR § 15064[b][2])

"When adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (14 CCR § 15064.7[c])

CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Staff Method

Staff evaluates (1) the alteration to the existing *landscape* [8] by a proposed *project* [9] using the CEQA Guidelines, Appendix G, I. Aesthetics;[10] and (2) the conformance of the proposed project with aesthetics and visual resources related LORS in accordance with Public Resources Code section 25525.

Completing an evaluation typically entails examining aerial and street view imagery, Geographic Information System (GIS) information, site and vicinity photographs including any photograph from a key observation point, the photo-realistic simulation(s) of the project in the existing landscape, elevations, architectural and site development plans, drawings, and renderings; review of applicable federal, state, and local government codes and regulations, maps and plans, tour book guide, road atlas, and a visit to the project site, key observation point, and surrounding area to determine the CEQA Guidelines level of effect on the environment and conformance with LORS by the project.

5.15.2.2 Direct and Indirect Impacts

Scenic Vista

a. Would the project "[h]ave a substantial adverse effect on a scenic vista?"

Neither CEQA nor the CEQA Guidelines provide a definition of what constitutes a scenic vista. As already noted, lead agencies may look to local planning thresholds for guidance when defining the visual impact standard for the purposes of CEQA.[11] A general plan, specific plan, zoning, or other planning document can provide guidance.

8 Landscape is defined as "The outdoor environment, natural or built, which can be directly perceived by a person visiting and using that environment. A scene is the subset of a landscape which is viewed from one location (vantage point) looking in one direction." (Hull and Revell 1989) "The term landscape clearly focuses upon the visual properties or characteristics of the environment, these include natural and man-made elements and physical and biological resources which could be identified visually; thus non-visual biological functions, cultural/historical values, wildlife and endangered species, wilderness value, opportunities for recreation activities and a large array of tastes, smells and feelings are not included." (Daniel and Vining 1983; Amir and Gidalizon 1990)

9 A thermal or nonthermal generating facility with a capacity of 50-megawatts or more. An energy storage facility with a capacity of 200-megawatt hours or more. (See Pub. Res. Code § 25120 and 25545-25545.2)

10 California Code of Regulations, Title 14, Division 6, Chapter 3, Article 20 Appendix G Environmental Checklist Form, I. Aesthetics amended December 28, 2018.

11 *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App. 4th 477.

The California Energy Commission in its certification (approval) for a number of thermal power plant projects has used as the definition for a *scenic vista*, "a distant view of high pictorial quality perceived through and along a corridor or opening." [12]

In this definition, "... perceived through and along a corridor or opening" refers to the potential movement into or through a portion of landscape limited by either elevated landforms bounding the observer's field of view in a rural landscape, or dominant man-made horizontal and/or vertical massed components[13] at regular intervals bounding the observer's field of view in an urban landscape. No specific observer locations form the basis for the visual unit boundary. Usually, a distinct change in the extent and direction of views from the ground is the determining factor. The space within it inherently variable in appearance having its own distinct visual character. The scenic distinction created by the combination of components within and bounding it enable the viewer to accumulate and form a unified impression (e.g., breathtaking, stunning, unsettling, repulsive). An example of a scenic vista in a rural landscape would include the view through and along the Yosemite Valley from the Wawona Tunnel overlook in Yosemite National Park, California. Two examples in an urban landscape would be the view through and along the National Mall from the Washington Monument in Washington, D.C. Also, the view through and along Capitol Mall from the Tower Bridge to the California State Capitol building in Sacramento, California.

Once a scenic vista is identified, an adverse effect is presumed when a sizable component(s) of the project physically changes the scenic vista (e.g., obstruct).

Permanent Facility

Significant and Unavoidable Impact. The 2,855-acre project site has been devoted to and used for the commercial growing and harvesting of timber that meet the requirements of the California Timberland Productivity Act of 1982 and for uses compatible with the growing and harvesting of timber.

Staff reviewed current aerial and street view imagery (Google Earth, Google Maps), United States Geological Survey (USGS) map information, other area maps, and photographs showing the project site and vicinity. A portion of the 2,855-acre project

12 California Energy Commission Final Decision for GWF Tracy Combined Cycle Power Plant Project Docket Number 08-AFC-7, Visual Resources, p. 321; California Energy Commission Decision for Mariposa Energy Project Docket Number 09-AFC-3, Visual Resources, p. 5; California Energy Commission Decision for Blythe Solar Power Project Docket Number 09-AFC-6, Visual Resources, p. 514; California Energy Commission Decision for Genesis Solar Energy Project Docket Number 09-AFC-8, Visual Resources, p. 7-8; California Energy Commission Decision for Pio Pico Energy Center Docket Number 11-AFC-01, Visual Resources, p. 8.5-4.

13 A "component" is an individual object that makes up the landscape, physical and visible, natural and man-made which can be described, quantified, and measured.

site is within a "saddle"[14] in the southern Shasta Cascade in Shasta County (see **Figure 5.15-1**).

The project is to be constructed on and surrounding Fauries Peak (4,780 feet elevation) and Carberry Mountain (5,169 feet elevation), the east side of Fuller Mountain (4,547 feet elevation), and the west side of Ward Butte (5,010 feet elevation).

The project would require the removal of forestland to permit the construction/installation of 48 wind turbine generators (wind turbines) white in color with a maximum blade tip height of 610 feet;[15] three 394-foot-tall meteorological evaluation towers (METs); one 150-foot-tall microwave relay tower; a five-acre concrete batch plant with a 55-foot-tall silo (up to three batch plants may be involved during the construction period); a 15-foot-tall operations and maintenance facility (7,000 square feet); an eight-acre switching station, and a five-acre substation connecting a network of overhead transmission lines using 90-foot-tall wood poles. The project also includes 19 miles of new road and 19 miles of widening existing roads. Refer to the Stantec Consulting Services, Inc., Fountain Wind Project, Project Description update redline docketed March 4, 2024, for greater detail about the project (Stantec 2023c).

The site plan for the project shows seven wind turbines spanning the saddle between Fuller Mountain and Carberry Mountain on the westside of Carberry Mountain, and four turbines crossing the saddle on the eastside of Carberry Mountain (see **Figure 5.15-2** and **Figure 5.15-3**). The sizable components of the project would physically change, obstruct, a scenic vista as defined (the saddle).

Project structures and equipment are being sited on a "High Slope" — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope), and at an "Interfluve" — linear top of ridge, hill or mountain. The spatial position of project components on the project site would be prominent in the saddle.

The reflectance[16] from the exterior surfaces of structures and equipment above the height of the mature tree canopy during daylight in the saddle given the existing physical environment presents a potential significant effect (see **Figure 5.15-4**).

The color, form, texture, scale, motion (e.g., rotating wind turbine blades), and new artificial light, and reflectance by the project in the existing physical environment would have an adverse effect.

14 A "saddle" is a major landform that is a dip or low point between two higher-elevation landmasses, such as two hills or mountains. It can vary in shape from a narrow gap to a broad, shallow valley. A wide gap often has the physical shape of a saddleback hence the name "saddle."
15 The applicant states, "An area up to 2.5 acres around the turbines would be removed from timber production and maintained as a defensible space containing low-growing vegetation." (Stantec 2023c)
16 Reflectance is the proportion of perpendicular incident light reflected from the surface or body of a material. (Electrical4U 2020)

The Shasta County General Plan scenic highways map (Figure SH-1) designates the summit of Hatchet Ridge (4,368 feet elevation) on SR-299, a "Gateway." A Gateway is a location which marks the entrance to a community or geographic area. SR-299 from Bella Vista to the summit of Hatchet Ridge is shown as a "Corridor In Which Natural Environment Is Dominant."[17] A portion of the project site is in the Corridor In Which Natural Environment Is Dominant. The color, form, texture, scale, motion, and new artificial light, and reflectance by the project in the existing physical environment would not be consonant with the existing forestland landscape, and the county designations.

The proposed project would create a *significant effect on the environment* (see above table CEQA Guidelines Levels of Effect on the Environment).

Scenic Resources

b. Would the project "[s]ubstantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?"

Neither CEQA nor the CEQA Guidelines provide a definition of what constitutes a scenic resource. A *scenic resource* in addition to being designated in an adopted federal, state, or local government planning document, plan, or regulation, as suggested in the above aesthetics question may be explained as a widely recognized natural or man-made feature tangible in the landscape. Hence a scenic resource includes but is not limited to the following:

- A natural feature or object that is part of the land, such as a geologic distinguishing characteristic (e.g., batholith, laccolith, mesa), a geomorphologic feature produced from deposition or erosion (e.g., gorge, inselberg, moraine). A water body (e.g., lake, waterway, estuary). A tree recognized for its aesthetic, botanical, and ecological value, or age, rarity, and size.
- A man-made feature or object that embodies elements of architecture or engineering design, detail, materials, or craftsmanship that represent a significant innovation or is unique, such as the California State Capitol, Golden Gate Bridge, Hollywood sign.

17 "The visible land area outside the actual right-of-way is generally described as the 'viewshed' or the 'scenic corridor.' The corridor encompasses the land easily visible from the highway. Depending on topography and air quality, the physical dimensions of the corridor may vary considerably. It is the visual quality of the man-made or natural environments within a scenic corridor that are responsible for its scenic value. Commonly, the physical limits of a scenic corridor are broken down into foreground views (zero to one quarter mile) and distant views (over one quarter mile)." (Shasta County General Plan, Scenic Highways Element, p. 6.8.01)

- A cultural resource,[18] historic property or landmark may be included. It should be recognized that cultural and historic values differ from aesthetic or scenic values (e.g., elegance, harmonious, imposing, sublime).

This analysis evaluated whether the project would substantially damage—eliminate or obstruct—public view[19] of a scenic resource, and whether the project would be situated so that it changes the visual appearance of a scenic resource by being in sharp contrast with the existing environment. The staff generally uses a three-mile[20] distance zone surrounding the project site for this analysis.

An adverse effect exists if the project would eliminate or obstruct a public view of a scenic resource, and/or change its visual appearance.

Permanent Facility

Less Than Significant Impact. The 2,855-acre project site has been devoted to and used for the commercial growing and harvesting of timber that meet the requirements of the California Timberland Productivity Act of 1982 and for uses compatible with the growing and harvesting of timber.

The staff review of current aerial and street view imagery (Google Earth, Google Maps), area maps, a tour book guide, road atlas, Wikipedia, and photographs showing the project site did not find/locate a scenic resource as defined on the project site or in the vicinity.

Staff reviewed the Shasta County General Plan and concluded there is no designated/protected scenic resource on the project site or in the vicinity. Also, a county ordinance identifying a specific scenic resource on the site or in the vicinity was not found.

The proposed project would not eliminate or obstruct a public view of a scenic resource nor change the visual appearance of it. The project would create a *less than significant effect on the environment*.

18 Cultural resources encompass all the physical evidence of past human activity. These could include buildings, structures, engineering features; prehistoric sites; historic or prehistoric artifacts or objects. These nonrenewable resources often yield unique information about past societies and environments and provide answers for modern day social and conservation problems. (NRCS 2024)

19 A public view can be defined as the area visible from a location where the public has a legal and physical right of access to real property (e.g., city sidewalk, public park, town square, state highway). California Code of Regulations, Title 14, Division 6, Chapter 3, Article 20 Appendix G Environmental Checklist Form, I. Aesthetics c. amended 12-28-2018, states “Public views are those that are experienced from publicly accessible vantage point.” The California Courts of Appeal, Fourth District wrote "Under CEQA, the question is whether a project will affect the environment of persons in general, not whether a project will affect particular persons." (*Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App. 4th 477.)

20 “Based on the curve of the Earth: Standing on a flat surface with your eyes about 5 feet off the ground, the farthest edge that you can see is about 3 miles away.” (Roland 2019)

Visual Character or Quality of Public View of Site and its Surroundings

c. Would the project "[i]n non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?"

Based on the definition of "urbanized area" under Public Resources Code section 21071,[21] staff determined the proposed project to be in a non-urbanized area.

An adverse effect exists if the project in a non-urbanized area significantly degrades the existing visual character or quality of public views of the site and its surroundings, or if in an urbanized area conflicts with zoning and other regulations governing scenic quality.

Key Observation Point Evaluation

"Visual landscape assessments involve the inventory and evaluation of diverse visible attributes of the landscape for purposes of planning, design and management. ... As currently practiced, visual assessments are firmly grounded in a tradition of knowing that requires the collection of empirical (often quantitative) data for analysis through systematic means. That is ... the landscape has a physical reality independent of people that can be characterized through various measurements. The landscape also has a reality that depends on our individual perceptions. These perceptions can be characterized or measured by various means."[22]

Staff evaluates a proposed project in the landscape using an adapted descriptive inventory methodology, formal aesthetic model.[23] See the evaluation flowchart below.

"Because it is difficult to describe visual appearance in words, visual assessments of the existing environment and the consequences of project alternatives should be based on 'illustrations of actual views'.... Because resources and time are always limited, it is also

21 An "urbanized area" means either "(a) An incorporated city that meets either of the following criteria: (1) Has a population of at least 100,000 persons. (2) Has a population of less than 100,000 persons if the population of that city and not more than two contiguous incorporated cities combined equals at least 100,000 persons." (Public Resources Code section 21071[a]) An urbanized area also includes unincorporated area that satisfies the criteria in Public Resources Code section 21071(b).
22 Palmer and Robin 2001, p. 149.
23 A visual landscape assessment is a process that evaluates the quality and characteristics of a landscape. Numerous techniques of landscape evaluation have been devised. The techniques can generally be divided into broad categories; descriptive inventories, public preference models, and quantitative holistic methods, subdivided further into non-quantitative and quantitative approaches that include ecological, formal aesthetic, phenomenological, psychological, psychophysical models, and direct/indirect, quantitative, quantitative/non-quantitative, and subjective/objective methods. It should be noted not all landscape evaluation techniques comport with CEQA and/or the CEQA Guidelines.

necessary to limit the number of views analyzed: it is essential that these be 'representative views,' neither understating nor overstating the visual effects of the project." (Smardon 1986, p. 255)

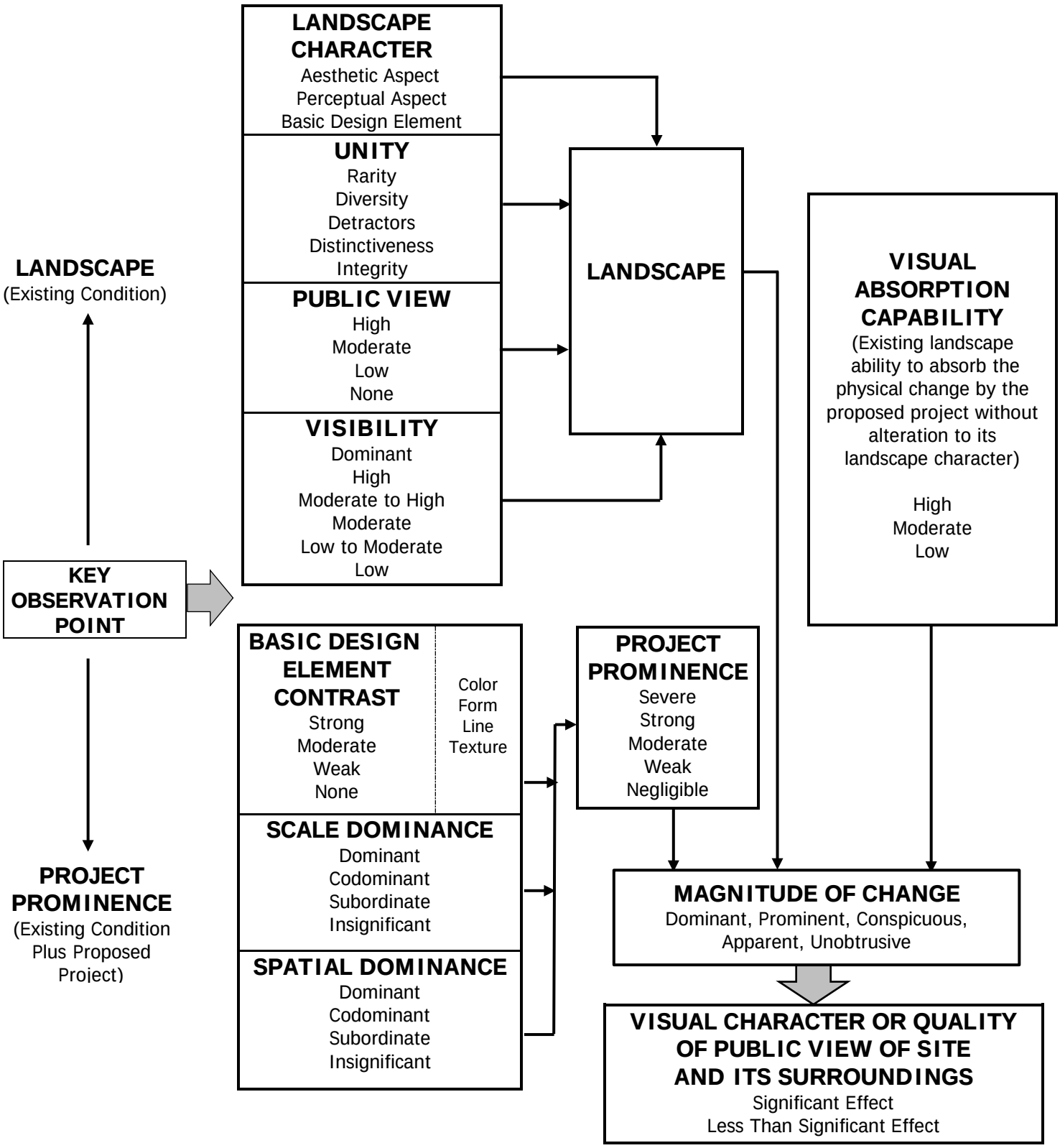
The primary purpose of a visual simulation is to accurately portray in a realistic manner and context a proposed activity (e.g., project) that modifies or changes the existing physical landscape. It is a photographic image that has been computer-modified to show a not-yet existing feature. A visual simulation is not a "real life view." It illustrates a two-dimensional view of a proposed activity from a particular viewpoint as depicted in a photograph and not as it would appear as a three-dimensional image as seen in the field with the human eye. With that being said, a visual simulation is a useful tool to assist in the assessment and decision-making process whereby better informed and more transparent judgements on visual related effects can be made.

In this analysis a key observation point, or KOP is used. A KOP is a fixed position in a publicly accessible location where a public view of the project is analyzed and evaluated in the landscape.

The applicant provided six photographs showing the existing physical landscape including the project site prior to alteration from a KOP (existing condition), and six visual simulations of the proposed project in the existing physical landscape from the same KOP (existing condition plus proposed project). See **Figures 5.15-5** through **18** (except **Figure 13**) attached to this section.

Staff completed a Key Observation Point Evaluation Worksheet (worksheet) for each KOP. The completed worksheets have been attached to this section. See **Key Observation Point Evaluation Worksheets 1 through 6**. A synopsis of each worksheet is presented below.

Evaluation Flowchart



Permanent Facility

Significant and Unavoidable Impact. The 2,855-acre project site has been devoted to and used for the commercial growing and harvesting of timber that meet the requirements of the California Timberland Productivity Act of 1982 and for uses compatible with the growing and harvesting of timber.

As previously indicated, the project requires the removal of forestland to permit the construction/installation of 48 wind turbines, other structures, and roadway. Turbines are to have a maximum blade tip height of 610 feet and be white in color. Each wind turbine is to have a 2.5-acre tree clearing surrounding it. The project also includes three 394-foot-tall METs; one 150-foot-tall microwave relay tower; a 15-foot-tall operations and maintenance facility; an eight-acre switching station, and a five-acre substation connecting a network of overhead transmission lines using 90-foot-tall wood poles, 19 miles of new roadway and 19 miles of widening existing roads.

Staff concludes given the existing physical landscape the project would substantially degrade the existing visual character or quality of public views of the site and its surroundings from KOP 4 and KOP 5.

KOP 1 (Figure 5.15-6). The KOP is along SR-299 at the driveway entrance to the United States Post Office Round Mountain. The nearest wind turbines would be approximately five miles to the east.

Potentially from this KOP a small number of the upper portion of the wind turbines including the nacelles[24] would be visible in the landscape beyond the ridge and in a backdrop of sky. Turbine blades would be noticeable when spinning. See **Figure 5.15-7**.

From the KOP given the existing physical landscape (existing physical environment), the project prominence (basic design element contrast, scale dominance, spatial dominance) in the landscape rated moderate. The visual absorption capability of the landscape rated moderate. The magnitude of change (dominant, prominent, conspicuous, apparent, unobtrusive) in the landscape rated conspicuous, meaning the project is clearly visible and noticeable in the view in the landscape. See **Key Observation Point Evaluation Worksheet** - **Key Observation Point No. 1**.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 in the worksheet this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

KOP 2 (Figure 5.15-8). The KOP is along SR-299 at the driveway entrance to the United States Post Office Round Mountain. KOP 2 is at the same location as KOP 1

24 The streamlined enclosure that houses key turbine components including the gears, rotor, and generator which sits atop the turbine tower.

except the field of view is rotated slightly to the east-southeast (an additional view). The nearest wind turbines and the two most visible ones in the landscape would be about 3.7 and 4.1 miles away.

Potentially from this KOP the upper portion of two wind turbines and the blades of six others from the L turbine string and M turbine string would be visible above the ridge. The blades would rotate in and out of the view above the ridge in a backdrop of sky. The turbine blades would be noticeable when spinning. See **Figure 5.15-9**.

From the KOP given the existing physical landscape, the project prominence in the landscape rated moderate. The visual absorption capability of the landscape rated moderate. The magnitude of change in the landscape rated conspicuous, meaning the project would be clearly visible and noticeable in the view in the landscape. See **Key Observation Point Evaluation Worksheet** - **Key Observation Point No. 2**.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 in the worksheet this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

KOP 3 (Figure 5.15-10). The KOP is along SR-299 at the driveway entrance to Montgomery Creek Elementary School. The nearest wind turbine is approximately three miles to the east.

Potentially from this KOP a small number of wind turbines would be visible in the landscape along the ridge in a backdrop of sky. Turbine blades would be noticeable when spinning. Turbines from the E and F strings would be most visible. Blade tips from the H and K strings would be detectable below the ridge. See **Figure 5.15-11**.

From the KOP given the existing physical landscape, the project prominence in the existing landscape rated moderate. The visual absorption capability of the landscape rated moderate. The magnitude of change in the landscape rated conspicuous, meaning the project would be clearly visible and noticeable in the view in the landscape. See **Key Observation Point Evaluation Worksheet** - **Key Observation Point No. 3**.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 in the worksheet this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

KOP 4 (Figure 5.15-12). The KOP is along SR-299 west of Bunch Grass Lookout Road. Bunch Grass Lookout Road is a restricted access road on the north side of SR-

299. It serves Hatchet Ridge Wind[25] (see **Figure 5.15-13**). The nearest and most visible project wind turbine in the landscape would be about 0.8-mile.

Potentially from this KOP the upper portion of seven wind turbines would be visible in the landscape with a small part of an eighth turbine visible above the ridge. The turbines, color, form, texture, scale, and motion would contrast in the existing physical environment. Turbines of the B, C, and F strings would have a dominant visibility (see "dominant" in Table 6 in the worksheet) in the landscape. During turbine operation the blades would rotate in and out of the view above the ridge in a backdrop of sky. See **Figure 5.15-14**.

From the KOP given the existing physical landscape, the project prominence in the existing landscape rated severe. The visual absorption capability of the landscape rated low. The magnitude of change in the landscape rated dominant, meaning the project would command or control the view in the landscape. See **Key Observation Point Evaluation Worksheet** - **Key Observation Point No. 4**.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 in the worksheet this combination of ratings yields a conclusion that the project would have a *significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

KOP 5 (Figure 5.15-15). The KOP is along SR-299 at the approximate location for the proposed east access road entrance to the project site. The road will have restricted access. The view shows a portion of the project site that includes a meadow and forestland. The nearest wind turbine would be approximately 1,500 feet from the KOP.

Potentially from this KOP wind turbines in B and C strings would have a high visibility (see "high" in Table 6 in the worksheet) in the landscape. The blades of the two nearest wind turbines would extend above the ridge rotating in and out in a backdrop of sky. Also, a proposed 40-foot-wide access road with a 20-foot drivable surface and 10-foot buffer on each side would ascend the slope beyond the meadow to serve a construction laydown area on the back side. See **Figure 5.15-16**.

From the KOP given the existing physical landscape, the project prominence in the existing landscape rated strong, and would be severe when viewing the additional turbines beyond the ridge. The visual absorption capability of the landscape rated low. The magnitude of change in the landscape rated prominent, meaning the proposed project would stand out or appear striking in the view in the landscape. See **Key Observation Point Evaluation Worksheet** - **Key Observation Point No. 5**.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 in the worksheet this combination of ratings yields a conclusion that the project would have a *significant*

25 Hatchet Ridge Wind has 44 wind turbines generating approximately 101 megawatts. The wind turbines have an approximate 416 feet blade tip height. The facility began commercial operation in 2010.

effect on the environment in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

KOP 6 (Figure 5.15-17). The KOP is at the junction of Main Street (SR-299) and Mountain View Road in the town of Burney. The proposed project wind turbines would be between seven and eight and a half miles away. Existing Hatchet Ridge Wind turbines are a little over five miles away.

Potentially from this KOP a few wind turbines along the ridge would have a high visibility (see "high" in Table 6 in the worksheet) in the existing physical environment, specifically the rotating blades. The proposed project turbines though larger in size than the existing Hatchet Ridge Wind turbines would appear at a similar scale due to their greater distance from the KOP. Also, the new wind turbines would appear as an extension of the existing string of turbines along Hatchet Ridge. See **Figure 5.15-18**.

From the KOP given the existing physical landscape, the project prominence in the existing landscape rated weak. The visual absorption capability of the landscape is rated high. The magnitude of change in the landscape rated unobtrusive, meaning the proposed project would appear indistinct, or not obvious in the view in the landscape. See **Key Observation Point Evaluation Worksheet** - **Key Observation Point No. 6**.

For the purpose of the CEQA Guidelines, and as set forth in Table 15 in the worksheet this combination of ratings yields a conclusion that the project would have a *less than significant effect on the environment* in the degrading of the existing visual character or quality of the public view of the site and its surroundings.

Light and Glare

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

The 2,855-acre project site has been devoted to and used for the commercial growing and harvesting of timber that meet the requirements of the California Timberland Productivity Act of 1982 and for uses compatible with the growing and harvesting of timber.

The project requires outdoor luminaires to illuminate driveways, entrances, walkways; operation, parking and loading areas, and for safety and security. Reflectance will occur from exterior surfaces of buildings, structures, and equipment. All surfaces reflect light.

Light, glare, and reflectance emitted from a project are analyzed to determine if each would create an adverse effect to the existing physical environment offsite and skyward (light pollution and reflectance).

Light Pollution

"Light pollution is the human-made alteration of outdoor light levels from those occurring naturally." (DarkSky 2024) Light pollution "occurs when outdoor lighting is misdirected, misplaced, unshielded, excessive or unnecessary. As a result, light spills unnecessarily upward and outward, causing glare, light trespass, and a nighttime urban 'sky glow' overhead, indicating wasted energy and obscuring the stars overhead" (Dark Sky Society 2024), and clutter.[26]

DarkSky International (formerly the International Dark-Sky Association) is a recognized worldwide authority combating light pollution. DarkSky International recognizes to minimize the harmful effects of light pollution, lighting should: only be on when needed; only light the area that needs it; be no brighter than necessary; minimize blue light emissions;[27] and be fully shielded.[28]

The DarkSky International "DarkSky Approved" program offers luminaires that significantly reduce light pollution and nocturnal habitat disruption. The DarkSky Approved program provides an objective, third-party certification for lighting related products that minimize glare, reduce light trespass, and do not pollute the night sky. These outdoor luminaires include among other design features and functions, shielding, no uplight allowance (BUG Rating U0[29]), luminaires that have dimming capability to one percent of full rating and no more than seven percent of visible emissions in 380-520 nanometers.[30]

Artificial Light and Nocturnal Creatures. "Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures, including amphibians, birds, mammals, insects, and plants. ... Predators use light to hunt, and prey species use darkness as cover."[31]

"Keeping the light **LOW** (mounting the fixture as low as possible) and **SHIELDED** (fully shielding the light so bulbs and/or glowing lenses are not visible) cuts down on the

26 Clutter is the bright, confusing and excessive grouping of light sources.
27 Studies show exposure to blue light can cause eye strain, fatigue, headaches, and sleeplessness.
28 "Fully shielded**"** means a luminaire constructed in a manner that all light emitted from the fixture, either directly from the lamp or a defusing element, or indirectly by reflection or refraction from any part of the luminaire is projected below the horizontal plane, as determined by photometric test or certified by the manufacturer.
29 "A BUG Rating stands for backlight, uplight, and glare. Backlight (B) is the light directed behind the fixture, uplight (U) is any light directed upward above the horizontal plane of the luminaire, and glare (G) is the amount of light emitted from the luminaire at high angles. The backlight, uplight, and glare ratings are assigned a value between 0 and 5 (with lower of the scale being more desirable) depending on the maximum amount of light in these zones based on thresholds defined by the Illuminating Engineering Society (IES) and enforced by the International Dark-Sky Association (IDA)" [now named DarkSky International]. (FirstLight 2024) A BUG rating is typically included in the product specifications.
30 The human eye can view the segment of the electromagnetic radiation spectrum wavelengths between 380 to 700 nanometers. This is the portion called "visible light."
31 DarkSky International keeps the Artificial Light at Night (ALAN) Database. It provides the latest scientific literature on how light pollution affects wildlife. (DarkSky 2024)

amount of glare and light visible to the animals, so that there is less opportunity for them to get trapped, repelled, or have their day/night patterns altered. Keeping it **LONG** wavelength (ambers and reds) actually makes the light that is visible seem dimmer to nocturnal animals that primarily use rod vision. The rod system's peak sensitivity is at 496 nm [nanometers], so a low pressure sodium light, with its emitted light at 589 nm, should seem 1/10th as bright to an animal using purely rod vision vs. an animal that uses rods and cones to see." (FFWCC 2024)

"Some Institutes and even cities have adopted a "Lights Out" program in which exterior lighting as well as interior lights in tall buildings are dimmed or turned off during periods of bird migration. Bare bulbs or upward pointing lights are replaced with hooded fixtures that only shine downward. If lights can't be turned off, then use flat lens, and reduce the number of lights and intensity. Both the height of the pole and the intensity of the lamp should be adjusted to only direct light where needed. ..." (NIEHS 2015)

Safety and Security Lighting. "Each organization should ensure a minimum level of light for their respective property areas that complies with all applicable regulations and industry guidelines. Security lighting requirements should be specified by a lighting engineer. Ideally, lighting requirements will be identified as part of a security survey. The lighting program should take account the following:

- Lighting should not illuminate security/protection officers or patrols. Where security patrols cannot be kept out of the zones of illumination, a judgment must be made between the advantages of the lighting and the reduction in patrol effectiveness.
- Lighting must be combined with surveillance. The deterrent effect of lighting depends on the fear of detection. This may also require video surveillance or security/protection officers on static posts and mobile patrols.
- Lighting must not cause nuisances or hazards to neighbors, such as light pollution or light trespass. Lighting may adversely affect adjoining or adjacent properties such as residential properties, roadways, airports, harbors, neighboring commercial buildings, or properties.
- Lighting must be cost-effective and compatible with site conditions. It may not be economical to illuminate very large areas. Take into account both the existing lighting outside the perimeter and the lighting installed within the site for operational or safety purposes." (Fenelly and Perry 2017)

Federal Aviation Administration Obstruction Marking and Lighting. Federal Aviation Administration (FAA) Advisory Circular No. 70/7460-1M Obstruction Marking and Lighting provides standards for marking (e.g., distinguishing color) and lighting structures to promote aviation safety. The advisory circular states the following:

> "Any temporary or permanent structure, including all appurtenances, that exceeds any obstruction standard contained in 14 CFR Part 77 or an overall height of 200 feet (60.96m) above ground level (AGL) should be marked and/or lighted. However,

> an FAA aeronautical study may reveal that the absence of marking and/or lighting will not impair aviation safety. Conversely, the object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure aviation safety. Recommendations for marking and/or lighting structures can vary, depending on terrain features, weather patterns, geographic location, number of structures, and overall design layout. The FAA may also recommend marking and/or lighting a structure that does not exceed 200 feet (60.96 m) AGL or 14 CFR Part 77 standards because of its particular location." (FAA 2020, p. 4)

The project has structures 200 feet above ground level and more. Specifically, the project has 48 wind turbine generators that have a maximum blade tip height of 610 feet, three meteorological evaluation towers each 394 feet tall, and a microwave relay tower 150 feet in height.

Reflectance

Reflectance is the proportion of perpendicular incident light reflected from the surface or body of a material. All surfaces reflect light. Light reflects off the surface in a very predictable manner.

"Reflectivity is defined as the property of a material to reflect the light or radiation. It is a measurement of reflectance irrespective of the thickness of a material." (Electrical4U 2020)

Exterior surface coatings and materials that diffuse illumination or collection, reflectance and scattering are of utmost importance. "An ideal coating is non-specular (to decrease geometrical effects) durable, high in reflectance and spectrally flat over a wide wavelength range to give a flat spectral response in input or output." (Labsphere, Inc. 2020) Materials with a non-shiny, textured or matt/powder finish are preferable to glossy or shiny finishes. A few examples of materials and surface treatments that should be avoided if possible: any material with a reflectance greater than 35 percent; any shiny, highly reflective materials even for small surfaces; large smooth surfaces; and large expanses of glass.

The Master Painters Institute (MPI) provides guidelines and standards for the architectural paint and coatings sector in the United States and Canada. "In order to provide Coatings Specifiers with a common language to describe Paint Finishes, MPI includes GLOSS and SHEEN measurements as part of the criteria for many of its MPI category specifications. MPI specifies 7 GLOSS levels, each of which are described below, along with their GLOSS measurement range (as seen at an 85º viewing angle)

and SHEEN measurement range (as seen at a 60º viewing angle[32]).” (Rodda Paint Company 2024).

Gloss Level 1 – Flat (traditional matte finish)

Gloss Level 2 – Satin/Pearl (high side sheen Flat, “Velvet-like” finish)

Gloss Level 3 – Eggshell (traditional “Eggshell-like” finish)

Gloss Level 4 – Low Gloss (“Satin-like” finish)

Gloss Level 5 – Semi Gloss (traditional Semi-Gloss)

Gloss Level 6 – Gloss (traditional Gloss)

Gloss Level 7 – High Gloss (High Gloss)

Permanent Facility

Significant and Unavoidable Impact. The 2,855-acre project site has been devoted to and used for the commercial growing and harvesting of timber and for uses compatible with the growing and harvesting of timber. Given the existing physical environment it is expected during night time there would be very little emission of artificial light, and during day time very little reflectance.

Staff reviewed the “World Atlas Night Sky Brightness” interactive map relevant to the location of the project. The map delineates physical radiance (brightness) homogeneously over an area from a relative location by color levels (a light pollution map).[33] See **Visual Resource Figure 19**.

Light Pollution and Reflectance. The applicant’s application states the following about onsite lighting during nighttime:

> “Project operations would require night lighting for safety and security. Exterior lighting affixed to the O&M building and other facilities interior to the site would be downward-facing and hooded to reduce potential effects for spillover light or glare outside of the developed area. The exterior lighting is not expected to be observable from any publicly accessible location. … Security lighting at gates at access points along SR-299 would be similarly shielded and downward-facing to the extent practicable. Gates would be set back from the highway, near the existing gates along these access roads (250 feet from the edge of the highway at the western access point and 50 feet from the edge of the highway at the eastern access point).

32 “A 60º viewing angle looking at a PAINT FINISH – The most common viewing angle used by the Coatings industry to describe the various levels, from Flat to High Gloss. The GLOSS of a surface is described by a number based on the reflection of light from the surface that is independent of color. The higher the number, the ‘Glossier’ the Paint Finish.” (Rodda Paint Company 2024)

33 The Dark Sky Map: Best Locations for Stargazing website, its “Dark Sky Map” is a community-powered platform that helps an individual discover and share the best places to observe the night sky. The site also maintains the “World Atlas Night Sky Brightness” an interactive map which delineates physical radiance homogeneously over an area from a relative location by color levels, <https://www.darkskymap.com/nightSkyBrightness>. (Dark Sky Map 2024)

> While any access gate lighting would be visible in brief perpendicular views at the western access point, vegetation clearing near the eastern project access point necessary to accommodate transport of turbine components would remove vegetation that would otherwise obscure the access gate for a roadway length of up to 300 feet. With vehicles traveling at highway speeds, the duration of time within which lighting at the gate would be visible would be relatively brief and would appear similar to other residential, commercial, and institutional lighting along other highway segments over Hatchet Pass." (Stantec 2023a, p. 2)

The applicant stated the following regarding the installation of FAA approved obstruction lighting and marking on project structures and equipment:

> "New sources of night light from the project would be associated with turbine hazard safety lighting required by the Federal Aviation Administration (FAA) and lighting installed on new project facilities.
>
> Designated turbines and METs would have flashing red lights installed to improve nighttime visibility for aviation and that comply with FAA standards and Advisory Circular 70/7460-1L. In accordance with these standards, the Applicant would prepare a lighting plan for the project and obtain FAA approval that would specify the installation of flashing red lights on designated turbines and METs to improve nighttime visibility for aviation. Because the height of the proposed turbines would be greater than 500 feet, it is expected that each would need to be lit with two flashing lights." (Stantec 2023a, p. 2)

The applicant has proposed the following project (facility) design measures pertaining to light and reflectance for consideration by the California Energy Commission and the Federal Aviation Administration:

- "Shielding and hooding lighting fixtures, except those required by the FAA for aviation safety purposes and orienting them toward the ground so that direct rays of light do not shine onto neighboring properties or otherwise become a source of light pollution.
- Use of sensors and switches to keep proposed project facility lights off when not required.
- Use of nonreflective paint finishes for turbine towers and blades, to the extent practicable, and subject to industry standards and requirements, to comply with the FAA's lighting and marking standards.
- Limiting or minimizing the visual effects of lighting to the maximum extent practicable in compliance with FAA requirements. Project lights typically used to comply with FAA requirements will, to some extent, be shielded from ground-level views due to a constrained (3 to 5 degree) vertical beam." (Stantec 2021, p. 21)

United States National Park Services. The United States National Park Services (NPS) has docketed a letter with the California Energy Commission expressing concerns

about protecting the nighttime sky (dark sky) above Lassen Volcanic National Park and the Whiskeytown National Recreation Area. The NPS letter states the following:

> "Both Lassen and Whiskeytown are great places to learn about and enjoy the dark night sky. Stargazing events are the most popular ranger-led activity at Lassen, and the significance of preserving the night sky is further demonstrated in the park's annual Dark Skies Festival that attracts thousands of visitors, scientists, and partners. An NPS viewshed analysis indicates that this project will be visible from Lassen Peak. The current Hatchet Ridge Wind project is directly visible from Lassen Peak and from several locations within Whiskeytown. Previously measured night sky conditions ranked Lassen Peak as one of the darkest locations in the national park service.
>
> The biggest threat to dark night skies is artificial lighting from nearby developments. Flashing red lights at the Hatchet Ridge Wind Project have caused some impacts to the night sky viewing experience at both Lassen and Whiskeytown, and we are concerned that the proposed Fountain Wind Project could introduce more impacts with the addition of artificial lights. We understand the requirement for safety lights to be included as required by the Federal Aviation Administration and look forward to working with you to explore mutually satisfactory measures that can help reduce impacts.
>
> Recommendations: The NPS recommends the use of an Aircraft Detection Lighting system (ADLS) as allowed by current FAA guidelines which will be important for reducing artificial light impacts to the night sky and nocturnal wildlife. To fully anticipate potential changes to the nighttime scene the NPS requests a lighting management plan be developed. Furthermore, given that the permanent turbine lighting, temporary construction lighting and associated facility lighting would have night sky effects, the NPS requests that the lighting management plan follow the NPS Sustainable Lighting Guidelines to minimize impacts. For prescriptive design of facility lighting we recommend the use of IES RP-43-22 Lighting Zone 1 Low. Lighting Zone 1 Low recommendations are in keeping with NPS guidance and are appropriate given natural levels of ambient light of the project area." (NPS 2023h)

According to the NPS, the "National Park Service Sustainable Outdoor Lighting Principles" are sustainable outdoor lighting basic principles primarily focus on the following: ensuring the lighting is necessary, directing light only where needed, utilizing fully shielded fixtures, light only when needed, using the minimum light level necessary, and opting for warm-colored LED lights to minimize light pollution and protect dark night skies.

The Federal Aviation Administration Advisory Circular No. 70/7460-1M Obstruction Marking and Lighting describes an Aircraft Detection Lighting System (ADLS) as follows:

> "Aircraft Detection Lighting System. Lights are controlled by sensor-based systems designed to detect aircraft approaching a single obstacle or group of obstacles and automatically activate the appropriate obstruction lights until the aircraft has

> departed the area and the lights are no longer needed. This technology reduces the impact of nighttime lighting on nearby communities and migratory birds, as well as extends the life expectancy of obstruction lights." (U.S. Department of Transportation Federal Aviation Administration Advisory Circular No. 70/7460-1M Obstruction Marking and Lighting, effective November 16, 2020, p. 15)

In brief, an ADLS is like a light switch used to turn a light on and off when the sensor-based system detects an approaching aircraft. Typically, the system has a horizontal radar detection of three to four miles and a vertical radar detection 1,000 feet above the tallest onsite structure.

The FAA Airport Technology Research & Development branch oversees evaluating the ADLS for safety and making sure it is in accordance with Chapter 14 of Advisory Circular No. 70/7460-1M.

The benefits of an ADLS are that it provides compliance with laws, ordinances, or conditions requiring light pollution mitigation, reduction of nighttime lighting on nearby communities, it reduces effects to migratory birds, and it extends the life expectancy of obstruction lights. Problems that come with an ADLS include additional cost, it requires continuous monitoring, creates lighting complaints, and the system is not depicted on aeronautical charts. Concerns include a pilot may become disoriented by its operation, and the system is not tracked in the Digital Obstacle File, a file that describes all known obstacles of interest to aviation users in the United States.

Air Navigation and Obstruction Lighting Evaluation From KOPs. Staff evaluated from the KOPs potential new artificial light in the existing physical environment due to the installation of FAA approved air navigation and obstruction lighting on the project site. It is anticipated the FAA would require at least two flashing red lights operating during nighttime on structures having a height of 200 feet above ground level. The FAA may require aviation safety related marking(s) including a color treatment on structures.

KOPs 1 and 2 – Round Mountain U.S. Post Office. Given the existing landscape, the nacelles of half of the wind turbines would be visible above the ridge. Flashing red lights on the turbines during nighttime would have a high visibility (see "high" in Table 6 in the worksheet) in the landscape.

KOP 3 – Montgomery Creek Elementary School. Given the existing landscape, six of the nacelles would be visible above the ridge. Flashing red lights on the turbines during nighttime would have a high visibility in the landscape.

KOP 4 – SR-299 west of Bunch Grass Lookout Road. Given the existing landscape, the flashing red lights on the wind turbines during nighttime would have a high visibility in the landscape.

KOP 5 – Fountain Wind Project proposed east access road entrance on SR-299. Given the existing landscape, flashing red lights on the wind turbines during nighttime would have a high visibility in the landscape.

KOP 6 – Burney (Central Area). At night there is emission of artificial light from a number of sources, and the flashing of air navigation and obstruction red lights from Hatchet Ridge Wind in the distance. The Hatchet Ridge Wind turbines flashing lights appear in a row along a ridge. The flashing red lights on the proposed turbines during nighttime would appear on top of the existing row of turbines. The combined lights of both projects would appear to extend farther across the ridge and wider along it.

Conclusions

The 2,855-acre project site has been devoted to and used for the commercial growing and harvesting of timber and for uses compatible with the growing and harvesting of timber. Because of this existing physical environment, it is believed at night the project site maintains significant dark sky above it and darkness on it.

Staff did not find in the application submittal and therefore was not able to review a conceptual light pollution control plan nor a list of luminaires and/or vendor brochures for the proposed project.

The applicant does not have knowledge of the specific design of the FAA approved obstruction lighting and marking on project structures and equipment until the FAA completion of an aeronautical study for the approved project by the California Energy Commission.

The applicant's application contains statements demonstrating the intent to implement shielding, directional light, non-reflectance materials, and other light pollution and reflectance project design measures.

Shielding is a key element in night-sky-friendly lighting. Fully shielded fixtures, also known as "full-cutoff" fixtures, are the gold standard. No light escapes upward or outward and a passerby is not blinded by the glare from an exposed bulb.

Staff concludes the level of new light, glare, and reflectance by the project on the project site below the mature tree canopy height given the existing physical landscape as described and explain in this analysis, and with the effective implementation of the applicant proposed written project design measures, as revised by the staff, and shown under "5.15.5 Proposed Conditions of Certification" (see **VIS-1** and **VIS-2**) would have a *less than significant effect on the environment*.

The reflectance from the exterior surfaces of structures and equipment above the height of the mature tree canopy during day time light given the existing physical environment presents a potential significant effect.

An FAA approved air navigation and obstruction lighting system including one that may involve an ADLS is designed to emit new artificial light beyond a project site (offsite) several miles to alert a pilot of an air navigation safety obstruction(s) on the property. Staff concludes new artificial light emitted from an installed FAA air navigation and obstruction lighting system(s) on the project site would introduce light in the existing physical environment not currently there that will not be contained on the project site thereby creating light trespass. The light trespass in the existing physical environment would have a *significant effect on the environment*. This is especially so given concerns expressed by the United States National Park Services regarding the new artificial light to the existing night sky darkness at the nearby national park and national recreation area where popular dark sky viewing activities (stargazing) are conducted.

It is noted Shasta County Ordinances, Title 17, Chapter 17.84 – General Development Standards regarding lighting states, "All lighting, exterior and interior, shall be designed and located so as to confine direct lighting to the premises. A light source shall not shine upon or illuminate directly on any surface other than the area required to be lighted."

5.15.2.3 Cumulative Impacts

Cumulative impacts of the project must be discussed if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable" (14 CCR § 15130[a]).

In accordance with CEQA Guidelines, section 15130(b), "... the discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact." (14 CCR § 15130[b])

"Where a lead agency is examining a project with an incremental effect that is not 'cumulatively considerable,' a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable." (14 CCR § 15130[a])

As previously identified under the Cumulative subsection in "Environmental Setting", six projects are located within a five-mile radius of the proposed project. Four of the projects are activities either occurring or foreseeable along and near SR-299 by Caltrans District 2, one existing project Hatchet Ridge Wind, and a foreseeable project Crossroads 2. Impacts pertaining to aesthetics/visual resources from these projects

could potentially combine with impacts by the proposed Fountain Wind Project causing a significant cumulative impact under "Aesthetics."

The incremental effect by the proposed project pertaining to construction activities potentially could become cumulatively considerable if construction activities at any or all six project sites were to occur at the same time, or just before or after the construction of the proposed project. Construction activities including the use, storage, and movement of equipment, and night lighting on or from these sites may combine with activities, equipment, and lighting on the proposed project site. The construction activities may lead to a continued presence of construction activity and light emission in the existing physical environment for several years. For the purpose of the CEQA Guidelines, staff concludes for "Aesthetics" with the implementation of **VIS-2** the incremental effect by the project would not be cumulatively considerable and have a *less than significant impact on the environment.*

The incremental effect by the Fountain Wind Project operation of an FAA approved air navigation and obstruction lighting system(s) in addition to the operating Hatchet Ridge Wind FAA approved air navigation and obstruction lighting system(s) in the existing physical environment would become cumulatively considerable and have a *significant and unmitigable impact* on the environment.

5.15.3 Project Conformance with Applicable LORS

In accordance with Public Resources Code, Division 15, Chapter 6.2, section 25545.8 (aka "opt-in certification program"), staff reviewed the proposed project for conformance with applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) relating to aesthetics/visual resources: scenic quality, scenic resources, scenic vista, lighting, glare, architectural design and site development, exterior surface coatings, colors, finishes, and materials, landscaping, and signage. Applicable LORS reviewed are shown in **Table 5.15-1** below.

Table 5.15-1 provides staff's determination of conformance with applicable LORS, including any proposed condition of certification, where applicable, to ensure the project would comply with LORS.

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Federal Aviation Administration (FAA) Advisory Circular No. 70/7460-1M Obstruction Marking and Lighting. FAA Advisory Circular (AC) No. 70/7460-1M Obstruction Marking and Lighting provides standards for marking and lighting structures to promote aviation safety.	**Yes**. The FAA would require the applicant to install air navigation and obstruction lighting and/or marked structures pending their completion of an aeronautical study for the approved project by the California Energy Commission. Recommendations for lighting structures can vary, depending on terrain features, weather patterns, geographic location, and number of structures.
"A Sponsor proposing any type of construction or alteration of a structure that may affect the	The applicant states in their application, "New sources of night light from the project would be

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
National Airspace System (NAS) as required under the provisions of Code of Federal Regulations (CFR), Title 14, Aeronautics and Space, Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (14 CFR, Part 77), is to FAA by completing the FAA Form 7460-1, Notice of Proposed Construction or Alteration." (FAA 2020, p. 1) "Any temporary or permanent structure, including all appurtenances, that exceeds any obstruction standard contained in 14 CFR Part 77 or an overall height of 200 feet (60.96m) above ground level (AGL) should be marked and/or lighted. However, an FAA aeronautical study may reveal that the absence of marking and/or lighting will not impair aviation safety. Conversely, the object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure aviation safety. Recommendations for marking and/or lighting structures can vary, depending on terrain features, weather patterns, geographic location, number of structures, and overall design layout. The FAA may also recommend marking and/or lighting a structure that does not exceed 200 feet (60.96 m) AGL or 14 CFR Part 77 standards because of its particular location. The marking and lighting configurations are illustrated in Appendix A." (FAA 2020, p. 4)	associated with turbine hazard safety lighting required by the Federal Aviation Administration (FAA) and lighting installed on new project facilities. Designated turbines and METs would have flashing red lights installed to improve nighttime visibility for aviation and that comply with FAA standards and Advisory Circular 70/7460-1L. In accordance with these standards, the Applicant would prepare a lighting plan for the project and obtain FAA approval that would specify the installation of flashing red lights on designated turbines and METs to improve nighttime visibility for aviation. Because the height of the proposed turbines would be greater than 500 feet, it is expected that each would need to be lit with two flashing lights." (Stantec 2023a, p. 2)
State	
California Scenic Highway Program. Section 263 of the Streets and Highways Code, the "State Scenic Highway System List" provides a list of highways that have been either officially designated or are eligible for designation as a State scenic highway.	**Yes**. The "State Scenic Highway System List" shows the project site is not along a designated State scenic highway.
Local	
Shasta County General Plan. The Shasta County General Plan indicates the project site spans the "Big Bend" and "North East Shasta County" planning area boundaries. General Plan Figure Pre-3 Planning Area Boundaries shows the project site land use designation "Timberland."	**No.** See Timberlands Element and Scenic Highways Element discussions below.
Timberlands Element. "The Shasta County Timberlands Element is a combination of planning requirements from the mandated Land Use, Conservation, and Open Space Elements.	**No**. The General Plan land use designation on the project site is Timberland. The proposed project is a use that would not be in conformance with the Timberland land use designation.

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
Portions of these mandatory elements relevant to timberlands are cited below. The diagram for the land use element shall designate those parcels of real property for timberland production which have been so zoned pursuant to the California Timberland Productivity Act of 1982, Chapter 6.7 (commencing with Section 51100) of Part 1 of Division 1 of Title 5 (Government Code Section 65302(a). A conservation element for the conservation, development and utilization of natural resources including...forests...the conservation element may also cover...protection of watersheds.... (Government Code Section 64302(d). Open space for the managed production of resources, including...forest lands.... (Government Code Section 65560(b)(2). Parcels zoned as timberland preserve shall be zoned so as to restrict their use to growing and harvesting and to compatible uses and shall be entered as a timber preserve element of the County General Plan. (Government Code Section 51115). Forest management is the application of business methods and forestry principles to the operation of a forest property for the purpose of maintaining forest resources and producing a continuous supply of forest products. Forest management is based on sound silviculture practices. **6.2.4 Policies** T-a Preservation of timberland shall be achieved by the use of the Timberlands land use designation. This designation shall be applied to lands as follows: • Lands now within a Timber Production Zone (TPZ) in accordance with the Forest Taxation Reform Act (hereinafter Act). • Lands which may be eligible to enter into a TPZ in accordance with the Act. • Lands not contained within either of the above categories which are suitable for	

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
timber production as shown on the adopted land use maps. • Timber producing lands which are sold or traded to a private landowner by a federal or state agency. T-b Timberlands within a TPZ shall be regulated as to use and subdivision as set forth in the Act. In addition to the permitted uses listed in the Act, other related and compatible uses may be conditionally permitted under applicable provisions of the Zoning Plan. T-c Timberlands submitted for entrance into a TPZ in accordance with the Act shall be comprised of single or contiguous parcels whose resource value(s) and size(s) comply with Table T-3." (Shasta County General Plan, Timberlands Element, pp. 6.2.05 to 6.2.06)	
Scenic Highways Element. The Scenic Highways Element of the Shasta County General Plan is intended to establish and protect State or county roads with scenic value. Figure SH-1 Scenic Highways map in the Scenic Highways element identifies scenic highways and special features. The summit of Hatchet Ridge on SR-299 is designated a "Gateway." SR-299 from Bella Vista to the summit of Hatchet Ridge is shown as a "Corridor In Which Natural Environment Is Dominant." SR-299 from the summit of Hatchet Ridge to Burney is shown as a "Corridor In Which Natural And Man-Made Environment Contrast." Policies "SH-a To protect the value of the natural and scenic character of the official scenic highway corridors and the County gateways dominated by the natural environment, the following provisions, along with the County development standards, shall govern new development: • setback requirements • regulations of building form, material, and color • landscaping with native vegetation, where possible • minimizing grading and cut and fill activities	**No**. The project includes 48 wind turbine generators with a maximum blade tip height of 610 feet, three 394-foot-tall meteorological evaluation towers, one 150-foot-tall microwave relay tower, an eight-acre switching station, and a five-acre substation connecting a network of overhead transmission lines using 90-foot-tall wood poles. The wind turbine generators would require a 2.5 acre clearing of forestland surrounding each turbine. The color, form, texture, scale, and motion by the project would not be in conformance with the Figure SH-1 Scenic Highways map designations and identifications.

TABLE 5.15-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
• requiring use of adequate erosion and sediment control programs • siting of new structures to minimize visual impacts from highway • regulation of the type, size, and location of advertising signs • utility lines shall be underground wherever possible; where undergrounding is not practical, lines should be sited in a manner which minimizes their visual intrusion." (Shasta County General Plan, Scenic Highways Element, pp. 6.8.01-6.8.06.)	
Shasta County Ordinances	
Shasta County Ordinances, Title 17, Chapter 17.08 - TP (Timber Production) Zone. The purpose and application of this zone district is as follows: "The purpose of the timber production (TP) district is to preserve lands devoted to and used for the growing and harvesting of timber, that meet the requirements of the California Timberland Productivity Act of 1982, and to provide for uses compatible with the growing and harvesting of timber. The TP district is equivalent to the timberland production zone referred to in the act. Land within a TP district is subject to all conditions and restrictions applicable to a timberland production zone. This district is consistent with the timberland (T) general plan designation, and may also be applied to other areas which meet the criteria of this district, provided there are no conflicts with other general plan policies." (Shasta County Ordinances, Title 17, Chapter 17.08, section 17.08.010)	**No**. The Shasta County zoning map shows the project site in the Timber Production (TP) zone district. The proposed project as described is not a permitted use under section 17.08.020, or a use granted by a conditional use permit under section 17.08.030.
Shasta County Ordinances, Title 17, Chapter 17.84 – General Development Standards regarding Lighting. It states the following: "All lighting, exterior and interior, shall be designed and located so as to confine direct lighting to the premises. A light source shall not shine upon or illuminate directly on any surface other than the area required to be lighted. No lighting shall be of the type or in a location such that constitutes a hazard to vehicular traffic, either on private property or on abutting streets." (Shasta County Ordinances, Title 17, Chapter 17.84, section 17.84.050)	**Yes**. Staff concludes new light and glare emitted from outdoor luminaries to illuminate driveways, entrances, walkways; parking and loading areas, illuminating an area below the existing mature tree canopy height with the effective implementation of the condition of certification **VIS-2** would be in conformance with Chapter 17.84.

5.15.4 Conclusions and Recommendations

As discussed, and explained in this section, the proposed project would have a *significant effect on the environment* under "Aesthetics" in accordance with the CEQA Guidelines and would be in *nonconformance* with identified LORS relating to aesthetics/visual resources in accordance with Public Resources Code, Chapter 6.2, section 25545.8.

The project would be constructed on 2,855 acres of forestland managed for timber production. The project requires removal of forestland to permit 48 wind turbine generators with a maximum blade tip height of 610 feet. Three 394-foot-tall meteorological evaluation towers, one 150-foot-tall microwave relay tower, a 15-foot-tall operations and maintenance facility, an eight-acre switching station, and a five-acre substation connecting a network of overhead transmission lines using 90-foot-tall wood poles. The project also includes 19 miles of new road and 19 miles of widening existing roads.

Staff reviewed the Shasta County General Plan. It shows the land use designation on the project site "Timberland." Objectives of this land use designation include the following:

> "T-1 Preservation of timberlands suitable for forest management and production to allow for the continuation of such uses or to provide opportunities for the future establishment of such uses.
>
> T-2 Protection of timberlands from incompatible adjacent land uses which adversely impact forest management activities." (Shasta County General Plan, Timberlands Element, pp. 6.2.05 to 6.2.06)

The proposed project involves a use that would be in nonconformance with the Timberland designation.

The Shasta County zoning map shows the project site in the TP (Timber Production) zone district. The project is not shown as a permitted use under section 17.08.020, or a use granted by a conditional use permit under section 17.08.030.

In addition, the Shasta County General Plan Scenic Highways Element (Figure SH-1) identifies the segment of SR-299 from Bella Vista to the summit of Hatchet Ridge as a "Corridor In Which Natural Environment Is Dominant." The segment of SR-299 from the summit of Hatchet Ridge to Burney is shown as a "Corridor In Which Natural And Man-Made Environment Contrast." The color, form, texture, scale, and motion by the wind turbines, other structures, equipment for the project would not be in conformance with the designations and identifications in the Scenic Highways Element and Figure SH-1.

Staff reviewed current aerial and street view imagery (Google Earth, Google Maps), USGS map information, other area maps, and photographs showing the project site and

vicinity. Staff also reviewed project site development plans, elevations, drawings, simulations, etc.

A portion of the project site is within a "saddle" in the southern Shasta Cascade in Shasta County. The color, form, texture, scale, motion, new artificial light, and reflectance by the project in the existing physical environment would have a *significant effect on the environment* to a scenic vista as defined that cannot be mitigated.

Staff evaluated six KOPs and concluded from KOP 4 and KOP 5 given the existing physical environment, the color, form, texture, scale, and motion by the wind turbines, other tall structures, and equipment on the project site cannot be camouflaged, disguised, screened, or exterior surface coated, colored or finished, nor can setbacks be employed that would mitigate the degrading of the existing visual character or quality of the public view of the site and its surroundings. At KOP 4 and KOP 5 the project would create a *significant effect on the environment*.

The project would require the installation of FAA approved air navigation and obstruction marking and lighting on project structures and equipment exceeding 200 feet height above ground. An air navigation and obstruction lighting system is designed to emanate artificial light from the project site several miles to alert a pilot of an air navigation safety obstruction on the property. The artificial light emitted from the project site offsite onto surrounding properties, light trespass, would create a *significant effect on the environment* that cannot be mitigated.

5.15.5 Proposed Conditions of Certification

If the California Energy Commission decides to certify the proposed project, the staff recommends the following conditions of certification:

VIS-1 The project owner shall use exterior surface coatings, colors, finishes, materials, and a gloss level that diffuse illumination or collection, reflectance and scattering offsite and skyward from the exterior surfaces of the project buildings, equipment, and structures, and specifically include:

a. An exterior surface coating, color, finish, material, and gloss level that minimize contrast and do not introduce specular reflection in the existing physical landscape.

b. An exterior surface coating, color, finish, material, and gloss level that is in conformance with applicable adopted architectural design and site development related policies and ordinances of the County of Shasta.

The project owner shall submit to the CPM for approval an exterior surface coatings, colors, finishes, and materials plan for the project buildings, equipment, and structures that satisfy the above requirements and include the following:

1. A list of the large/major buildings, equipment, structures; perimeter wall and/or fence; transmission line towers and/or poles; above ground pipelines

serving the facility onsite and offsite in public view, and a list of their proposed exterior surface coatings, colors, finishes, and materials identified by vendor, name and number, and according to the RAL color matching system or similar universal designation system.

2. Supply one set of brochures showing coating/color chips, and/or samples of the coatings/colors or finish, materials to be applied/installed to buildings, equipment, and structures.
3. A time schedule for the completion of the application/installation of the coating, color, finish, and materials.
4. A maintenance plan that includes procedures for the upkeep of the coatings, colors, finishes, and materials for the life of the project.

The project owner shall not purchase product or service from a vendor for the project exterior surface coatings, colors, finishes, materials prior to the Compliance Project Manager (CPM) approval of the exterior surface coating, color, finish, and materials plan.

Verification:

a. The project owner shall submit an exterior surface coating, color, finish and materials plan to the CPM for approval and simultaneously to the Director of the Shasta County Department of Resource Management for review and comment 90 days prior to executing a contract to purchase coating, color, finish and materials with a vendor. The CPM shall provide the Director of the Shasta County Department of Resource Management at least 30 days to review the plan and provide comments to the applicant and the CPM.

b. If the CPM determines that the exterior surface coating, color, finish and materials plan requires a revision, the project owner shall provide to the CPM a plan with the specified revision(s) for approval by the CPM before any action or activity with the vendor is executed. Any revision to the plan must be approved by the CPM.

c. The project owner shall notify the CPM that exterior surface coatings, colors, and finishes of all listed buildings, equipment, and structures has been completed are ready for inspection. With this notification, the applicant shall supply to the CPM one set of color photographs showing the project from the key observation points evaluated for the project certification, and onsite color photographs showing the completed exterior surface coatings, colors, finishes, and materials for the following: the wind turbine generators, overhead collector line, the MET, switching station, substation, O&M Facility, and any other building, structure, and equipment as requested by the CPM. Color photographs may be electronically filed or manually filed on electronic media.

d. Exterior surface coatings, colors, finishes, and materials shall be installed/applied (completed) on the exterior surfaces of the large/major buildings, equipment, and structures prior to the start of commercial operation.

e. The project owner shall supply a description of the condition (status) of the exterior surface coatings, colors, finishes, and materials for the large/major buildings, equipment, structures, and others as needed for the reporting year in the Annual Compliance Report. The report shall include:

   1. The condition of the exterior surfaces of buildings, equipment, and structures at the end of the reporting year.

   2. A listing of maintenance activities performed during the reporting year.

   3. A tentative time schedule for maintenance activities for the upcoming year.

VIS-2 New outdoor light and glare from the project site shall not result in light being a pollutant offsite and skyward, "light pollution." The project owner shall include use of luminaires that:

a. Only be on when needed.

b. Only light the area that needs it.

c. Illuminate no brighter than necessary.

d. Minimize blue light emissions.

e. Are fully shielded (BUG Rating U0).

f. Are DarkSky International "DarkSky Approved" program products.

g. Comply with the applicable adopted outdoor lighting regulations of the County of Shasta.

h. Comply with the United States "National Park Service Sustainable Outdoor Lighting Principles."

The project owner shall submit to the CPM for approval and simultaneously to the Director of the Shasta County Department of Resource Management, the Superintendent of Lassen Volcanic National Park, and the Superintendent of Whiskeytown National Recreation Area for review and comment a light pollution control plan or equivalent plan that satisfy the above requirements and include the following:

1. Supply one set of product brochures and/or printouts (e.g., diagram, drawing) showing and describing the types of outdoor luminaires to be applied/installed to buildings, equipment, structures, and other locations on the project site (lighting schedule).

2. A diagram(s) or drawing(s) of the project site showing the approximate location of the installation/placement of the luminaire and its direction and angle (luminaire location).

Verification:

a. The project owner shall submit a light pollution control plan to the CPM for approval and simultaneously to the Director of the Shasta County Department of Resource Management, the Superintendent of Lassen Volcanic National Park, and the Superintendent of Whiskeytown National Recreation Area for review and comment 90 days prior to executing a contract to purchase permanent outdoor luminaires for the project. The CPM shall provide the Director of the Shasta County Department of Resource Management, the Superintendent of Lassen Volcanic National Park, and the Superintendent of Whiskeytown National Recreation Area at least 30 days to review the plan and provide comments to the applicant and the CPM.

b. If the CPM determines the light pollution control plan requires a revision, the project owner shall provide to the CPM a plan with the specified revision(s) for approval by the CPM before any action or activity with the vendor is executed. Any revision to the plan must be approved by the CPM.

c. The project owner shall notify the CPM when the installation of the luminaires have been completed and are ready for inspection. After inspection if the CPM requires a modification to a luminaire(s) (e.g., design, installation, location), the project owner shall have 30 days after receiving the notification to complete the modification and request a follow-up inspection.

d. If a light and glare complaint is filed with the project owner within 48 hours of receiving the complaint, the project owner shall supply the CPM with a completed complaint resolution form report as specified in the Compliance Conditions, a proposal to resolve the complaint and time schedule for resolution. The project owner shall notify the CPM within 48 hours after completing/resolving the complaint.

5.15.6 References

Amir and Gidalizon 1990 – S. Amir and E. Gidalizon. “Expert-based method for the evaluation of visual absorption capacity of the landscape.” Journal of Environmental Management, Vol. 30, No. 3, April 1990, cited by The James Hutton Institute, August 12, 2014.

Amir, S., E. Gidalizon, “Expert-based method for the evaluation of visual absorption capacity of the landscape*,” Journal of Environmental Management, Vol. 30, April 1990.

California Code of Regulations, Title 14 section 15000 et sequentes.

California Code of Regulations, Title 14, Division 6, Chapter 3, Appendix G Environmental Checklist Form, I. Aesthetics as amended December 28, 2018.

Caltrans 2024 – California Department of Transportation (Caltrans). California State Scenic Highway System Map and Scenic Highway System Lists. Accessed on: January 26, 2024. Accessed online at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways

California Public Resources Code section 21000 et sequentes.

Daniel and Vining 1983 – Terry C. Daniel and Joanne Vining, "Methodological Issues in the Assessment of Landscape Quality," Behaviour and the Natural Environment, Plenum Press, New York, 1983, cited by The James Hutton Institute, August 12, 2014. Accessed on: February 5, 2024. Accessed online at: https://macaulay.webarchive.hutton.ac.uk/ccw/task-two/evaluate.html

DarkSky 2024 – DarkSky International (DarkSky). Accessed on February 5, 2024. Accessed online at: https://darksky.org/

Dark Sky Map 2024 -The Dark Sky Map: Best Locations for Stargazing, "World Atlas Night Sky Brightness," Accessed on October 15, 20204. Accessed online at: https://www.darkskymap.com/nightSkyBrightness

Dark Sky Society 2024 – Dark Sky Society. What is Light Pollution? Accessed on February 5, 2024. Accessed online at: https://www.darkskysociety.org/handouts/whatislp.pdf

Electrical4U 2020 – Electrical4U, "What is Reflectance?" October 11, 2020. Accessed on January 9, 2024. Accessed online at: https://www.electrical4u.com/what-is-reflectance/

FAA 2020 – Federal Aviation Administration (FAA) 2020 – FAA Advisory Circular 70/7460-1M Obstruction Marking and Lighting. Effective November 16, 2020. Accessed on: January 26, 2024. Accessed online at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/Advisory_Circular_70_7460_1M.pdf

Fenelly and Perry 2017 – Fennelly, Lawrence J. CPOI, CSSI, CHL-III, CSSP-1, Marianna A. Perry M.S., CPP, CSSP-1, Physical Security: 150 Things You Should Know, Second Edition, Butterworth-Heinemann, ISBN 978-0-12-809487-7, 2017. Accessed on May 30, 2024. Accessed online at: https://www.sciencedirect.com/topics/computer-science/security-lighting

FirstLight 2024 – FirstLight Technologies Ltd., "Lighting Fundamentals - BUG Ratings." Accessed on February 5, 2024. Accessed online at: https://www.firstlighttechnologies.com/solar-light-blog/lighting-fundamentals-bug-ratings/

FFWCC 2024 – Florida Fish and Wildlife Conservation Commission (FFWCC), "About Lighting Pollution," n.d., Accessed on January 29, 2024. Accessed online at: https://myfwc.com/conservation/you-conserve/lighting/pollution/

FWPA – Fountain Wind Project Application (TN 248288-1 through TN 248288-18) Shasta County DEIR. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Governor's Office of Planning and Research. "2018 CEQA Guidelines Update." Accessed on January 9, 2024. Accessed online at: https://opr.ca.gov/ceqa/guidelines/updates.html

Hull and Revell 1989 – R. Bruce Hull and Grant R.B. Revell (Hull and Revell). "Issues in sampling landscapes for visual quality assessments," Landscape and Urban Planning, Vol. 17, No. 4, August 1989, pgs. 323-330 cited by The James Hutton Institute, August 12, 2014. Accessed on: February 5, 2024. Accessed online at: https://macaulay.webarchive.hutton.ac.uk/ccw/task-two/evaluate.html

Labsphere, Inc. 2020 – Labsphere, Inc., "Technical Guide Reflectance Coatings and Materials," n.d., Accessed on May 13, 2024. Accessed online at: https://www.labsphere.com/resource/page/2/?r_type%5B0%5D=146

Mira Mar Mobile Community v. City of Oceanside (2004) 119 Cal. App. 4th 477.

NIEHS 2015 – National Institute of Environmental Health Sciences, "The Impact of Artificial Lighting on Nocturnal Wildlife," April 20, 2015. Accessed on May 30, 2024. Accessed online at: https://kids.niehs.nih.gov/topics/natural-world/wildlife/ecology/lighting

NPS 2023h – National Park Service (TN 253663). National Park Service Comments - Night Sky Impacts to Two Nearby National Park Sites and Communities, dated December 18, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

NRCS 2024 – U.S. Department of Agriculture Natural Resources Conservation Service, Cultural Resources (NRCS). Accessed on May 23, 2024. Accessed online at: https://www.nrcs.usda.gov/cultural-resources

Palmer and Robin 2001 – J. Palmer and R. Hoffman, "Rating reliability and representation validity in scenic landscape assessments," Landscape and Urban Planning, Vol. 54, 2001.

Panagopoulos and Ramos 2006 – T. Panagopoulos and B. Ramos (Panagopoulos and Ramos) "Methods to assess aesthetic value for forest planning and design," University of Algarve, Portugal, 2006. Accessed on February 5, 2024. https://homedocbox.com/Landscaping/109446326-Methods-to-assess-aesthetic-value-for-forest-planning-and-design.html

Rodda Paint Company 2024 – Rodda Paint Company, "Selecting Gloss Level," n.d. Accessed on January 23, 2024. Accessed online at: https://www.roddapaint.com/how-to/selecting-gloss-level/

Roland 2019 – James Roland, "How Far Can We See and Why?" May 23, 2019, Accessed on December 1, 2023. Accessed online at: https://www.healthline.com/health/how-far-can-the-human-eye-see,

Shasta County General Plan, Scenic Highways Element, as amended September 2004. Accessed on: January 26, 2024. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan orhttps://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3048/68scenic.pdf

Shasta County General Plan, Timberlands Element, as amended September 2004. Accessed on: March 19, 2024. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan

Shasta County Ordinances, version July 1, 2024. Accessed on September 20, 2024. Accessed online at: https://library.municode.com/ca/shasta_county/codes/code?nodeId=CD_ORD_TIT17ZO

Sheppard, Stephen R.J., Visual Simulation A User's Guide For Architects, Engineers, And Planners, Van Nostrand Reinhold, New York, 1989.

Smardon 1986 – Smardon, R.C., J.F. Palmer, J.P. Felleman, (Smardon). Foundations for Visual Project Analysis, Wiley, New York, 1986. Stantec 2021 – Stantec (TN 248320). Fountain Wind Project, Visual Resources Technical Report, dated March 5, 2021. Accessed on: February 2, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023a – Stantec (TN 251199). Fountain Wind Visual Resources Technical Report Addendum, dated July 26, 2023. Accessed on: February 1, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023b – Stantec (TN 251663). Fountain Wind Project, Project Description, dated July 10, 2023. Accessed on: January 28, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023c – Stantec (TN 254794). Fountain Wind Project, Project Description, dated March 1, 2024. Accessed on: November 14, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

3M – 3M Traffic Safety Systems Division (3M). "Reflectivity," 2004. Accessed on: February 5, 2024. Accessed online at: https://multimedia.3m.com/mws/media/295767O/reflectivity-flyer.pdf

Figure 5.15-1

View from the Caltrans maintained Hatchet Mountain Vista Point (a pullout) on State Route 299 (3,300 feet elevation) looking southwest at Ward Butte and to the west at Carberry Mountain. The proposed 2,855-acre project site is to the west about one and a half miles. The view shows a scenic vista as defined, the "saddle" or gap in the topography. Photo credit: Darayush Mistry, "Hatchet Mountain Vista Point – looking towards Burney," Google Maps, April 2021, accessed on October 12, 2024.

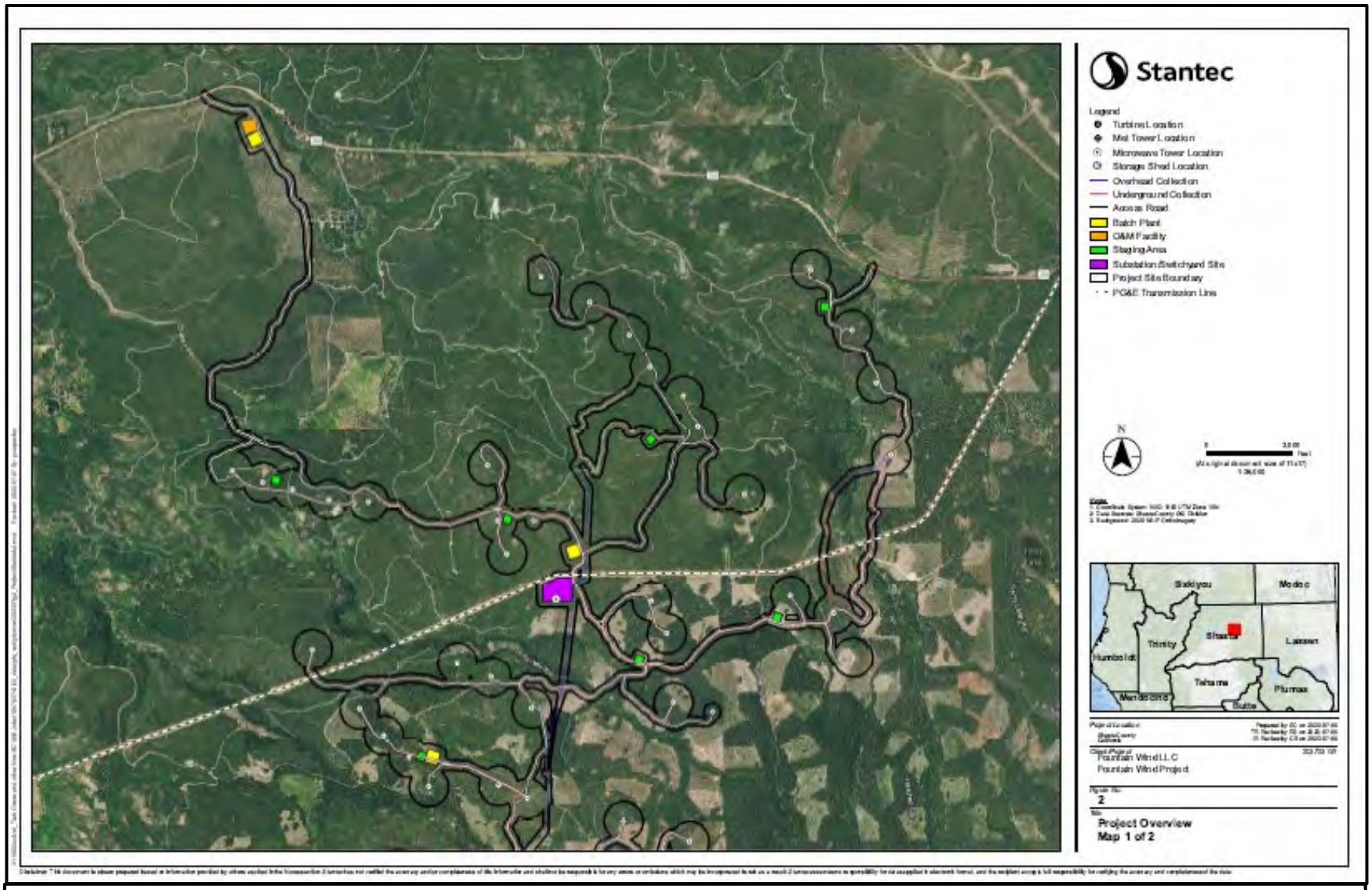


Figure 5.15-2

Project site aerial overview northern portion of the 2,855 acres. Source: Stantec Consulting Services, Inc., docketed March 4, 2024, as TN #254794.

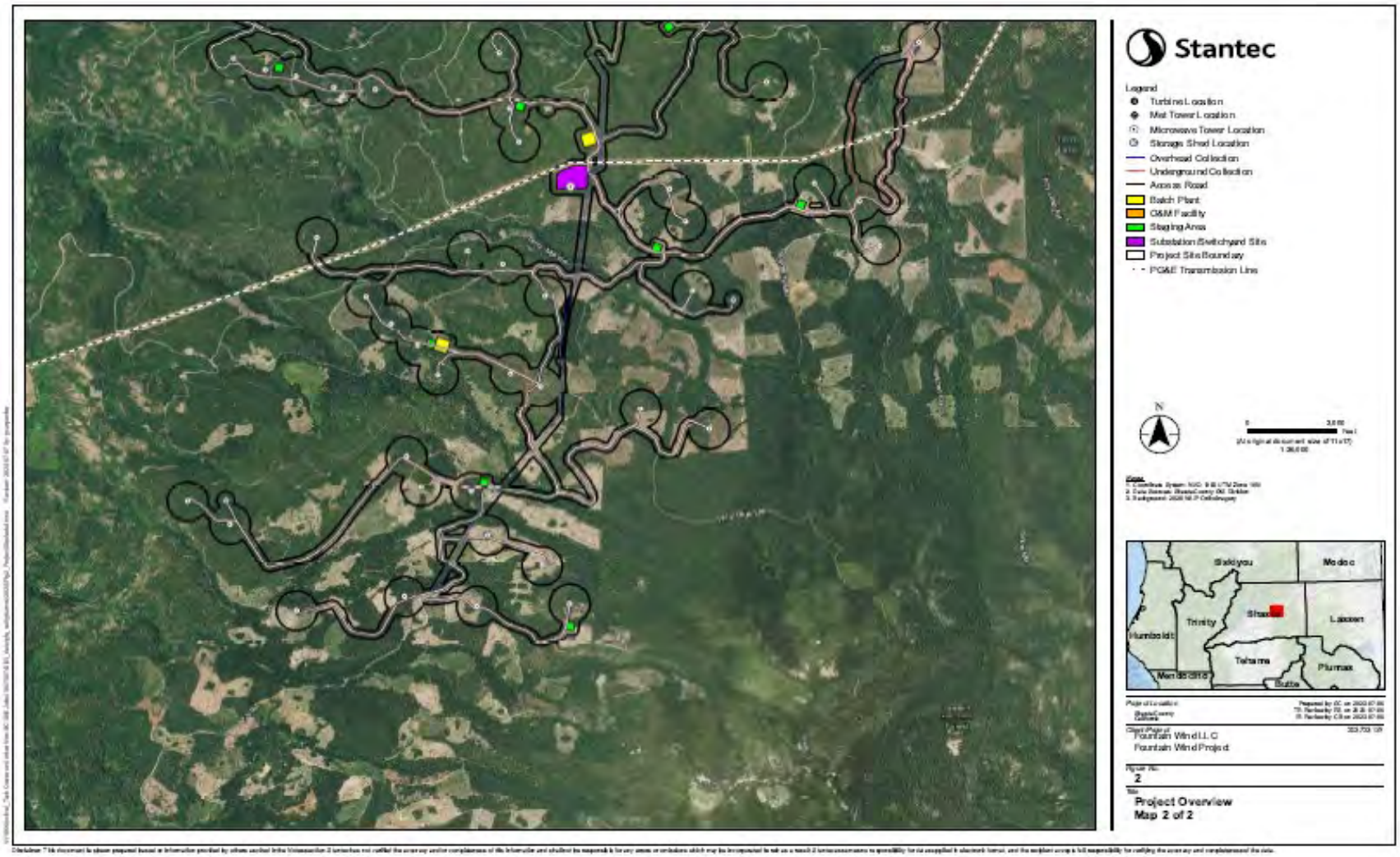


Figure 5.15-3

Project site aerial overview southern portion of the 2,855 acres. Source: Stantec Consulting Services, Inc., docketed March 4, 2024, as TN #254794.

Figure 5.15-4

An image showing existing wind turbine generators on forestland (top photo) and a simulated image showing wind turbine generators above a mature tree canopy on forestland (bottom photo). Photo credit: ConnectGen, "Fountain Wind Project," 2023, ConnectGen website: https://www.fountainwind.com/ and https://www.connectgenllc.com/-project/fountain-wind-project/, accessed on November 10, 2024.

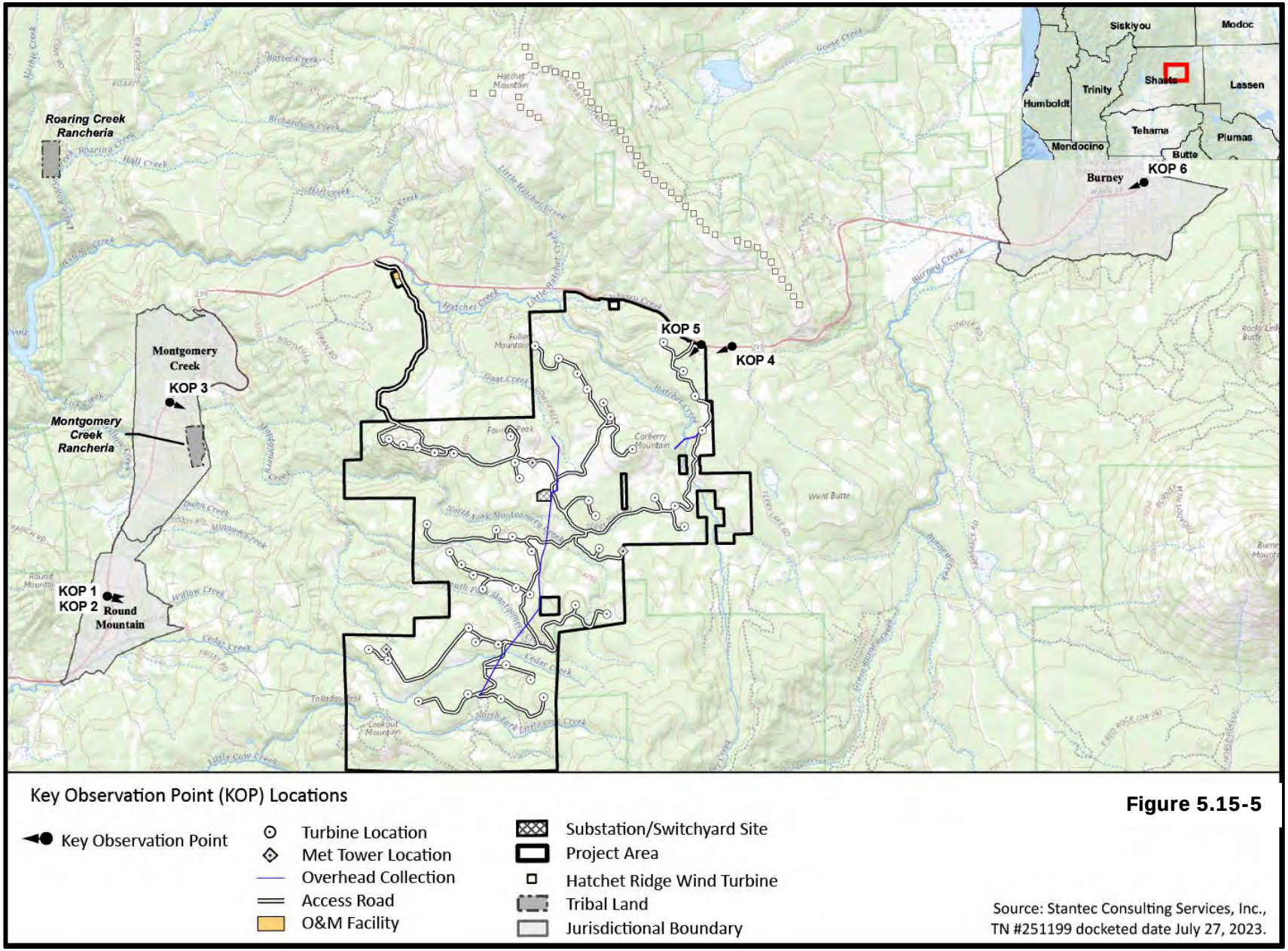


Figure 5.15-5

Source: Stantec Consulting Services, Inc., TN #251199 docketed date July 27, 2023.

Figure 5.15-6

Existing view from KOP 1 - United States Post Office Round Mountain driveway entrance on SR-299. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-7

Existing view from KOP 1 plus simulated project components. Source: Stantec Consulting Services Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-8

Existing view from KOP 2 - United States Post Office Round Mountain driveway entrance on SR-299 looking east-southeast.
Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-9

Existing view from KOP 2 plus simulated project components. Source: Stantec Consulting Services Inc., docketed June 9, 2023, as TN #250566.

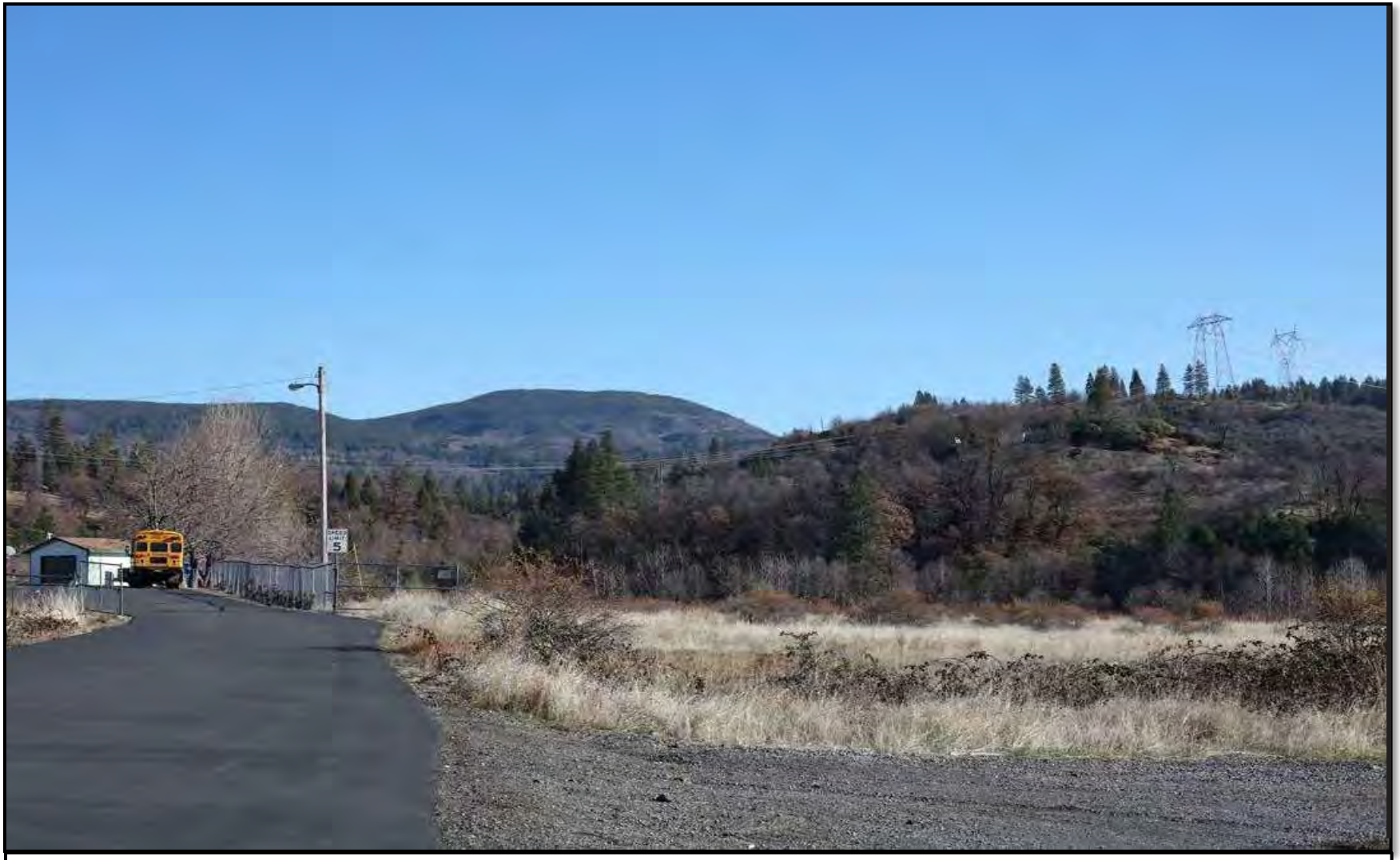


Figure 5.15-10

Existing view from KOP 3 - Montgomery Creek Elementary School driveway entrance on SR-299. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-11

Existing view plus simulated project components from KOP 3. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-12

Existing view from KOP 4 - west of Bunch Grass Lookout Road on SR-299. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-13

View showing existing wind generator turbines at Hatchet Ridge Wind on the northside of SR-299 approximately one-mile east of the proposed Fountain Wind Project site in Shasta County, California. Photo credit: Carlos Avila Gonzales, “An epic battle is brewing between California and deep-red Shasta County. Here are the details,” San Francisco Chronicle, December 10, 2023.

Figure 5.15-14

Existing view from KOP 4 plus simulated project components. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-15

Existing view from KOP 5 – the location for the proposed east access road entrance to the project site on SR-299.
Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-16

Existing view from KOP 5 plus simulated project components. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-17

Existing view from KOP 6 – junction of Main Street (SR-299) and Mountain View Road in the town of Burney. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

Figure 5.15-18

Existing view from KOP 6 plus simulated project components. Source: Stantec Consulting Services, Inc., docketed June 9, 2023, as TN #250566.

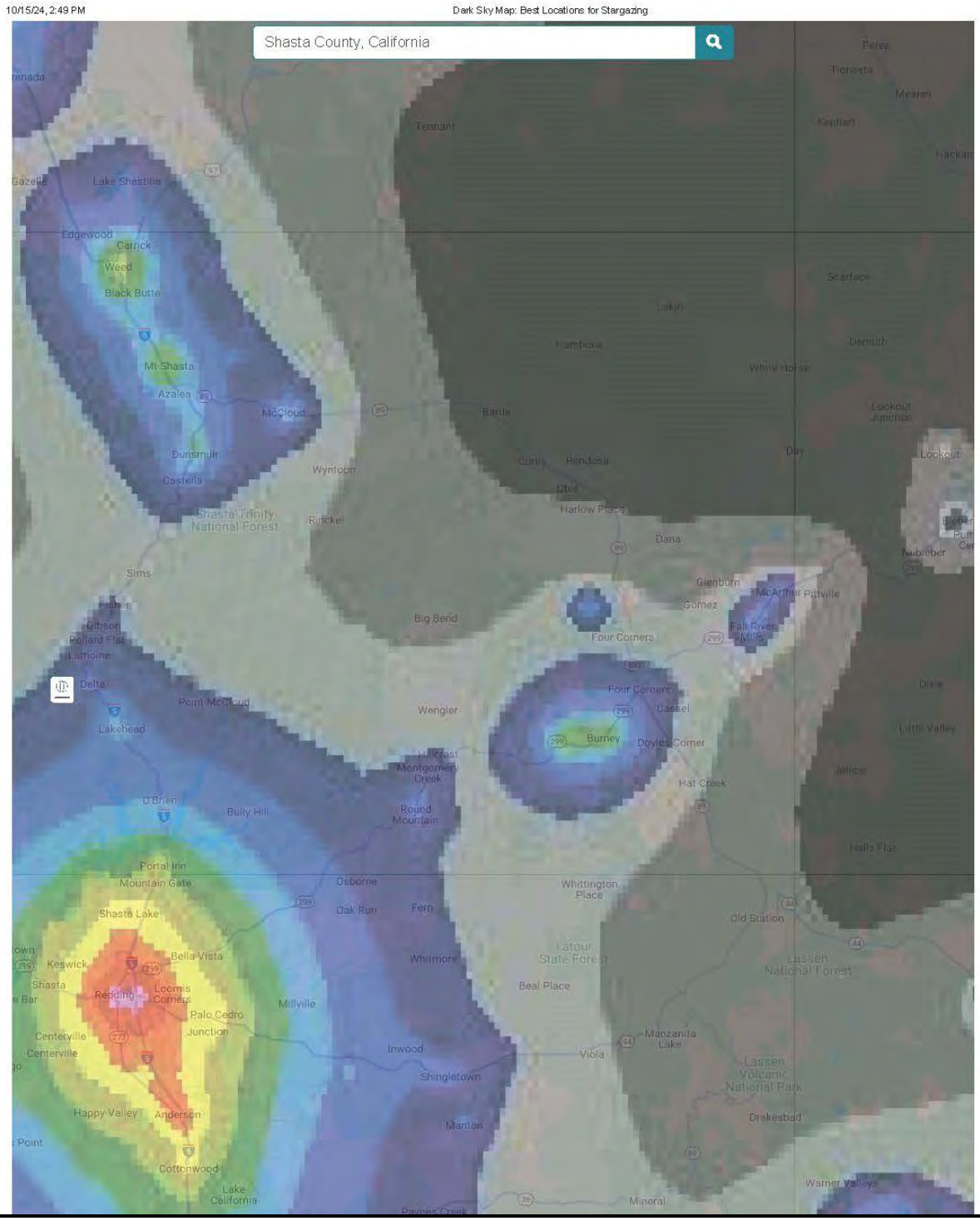


Figure 5.15-19

Map showing night sky brightness from Redding, Montgomery Creek, Burney and surrounding area in Shasta County, California. The greater the dullness of the color the less the amount of emitted illumination (artificial light) in the area. The proposed project site is east of Montgomery Creek. Source "World Atlas Night Sky Brightness," Dark Sky Map: Best Locations for Stargazing, https://www.darkskymap.com/nightSkyBrightness, accessed on October 15, 2024.

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 1 – U.S. Post Office Round Mountain Driveway Entrance

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Moderate to High	
	Distinctiveness	Low to Moderate	
	Diversity	Low to Moderate	
	Integrity	Low to Moderate	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High		
	Moderate	√	
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	6
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	10

Table 8 SCALE DOMINANCE

Rating		Points
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.	12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.	8
Subordinate	The project is of significant size but occupies a minor part of the landscape.	4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.	0
	Single highest points / Maximum 12 points	4

Table 9 SPATIAL DOMINANCE

Category	Rating	Single Highest Rating	Points
Spatial composition of the landscape.	prominent **significant** inconspicuous	Dominant 2-3 categories rated prominent.	6
Spatial position of the project.	prominent **significant** inconspicuous	**Codominant** 1 category rated prominent, or 2 categories rated significant.	4
Backdrop to the project.	**prominent** inconspicuous	Subordinate 1 category rated significant.	2
		Insignificant All categories rated inconspicuous.	0
		Single highest points / Maximum 6 points	4

Table 10 PROJECT PROMINENCE RATING

Total Points	Rating
32-39	Severe
24-31	Strong
16-23	**Moderate**
8-15	Weak
0-7	Negligible
	Rating ≡ Moderate

VISUAL ABSORPTION CAPABILITY

Table 11 CAPABIITY
Table 12 ABSORPTION

Rating	Checkbox	
High		The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
Moderate	√	
Low		

Table 13 MAGNITUDE OF CHANGE

		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	√
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS

CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	√

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 1

Table 3 LANDSCAPE CHARACTER

Aesthetic	**Description**										
Balance	harmonious		balanced		discordant	√	chaotic		Check (√) the description that best identifies the aspect of the landscape.		
Complexity	uniform		simple		diverse		complex	√			
Dynamic	sweeping		spreading		disperse	√	channeled				
Enclosure	expansive		open	√	enclosed		constrained				
Pattern	formal		organized		regular	√	random				
Perceptual											
Pleasure	beautiful		attractive		pleasant		unpleasant	√	nasty		
Security	intimate		comfortable		safe	√	unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote		vacant		peaceful		busy	√	
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements in a landscape are what create the aesthetic appeal that an individual responds to when viewing a space.		
Form	angular		curvilinear		horizontal		rounded	√			
Line	straight		curved	√	vertical		horizontal				
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small	√	large		vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36, and Christine Tudor, "An Approach to Landscape Character Assessment, Natural England, October 2014, pp. 42-43.

Table 4 UNITY

Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many	√			few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly			√	muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole			√	remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.
Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.	

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High √ Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Design Element	Rating[1]	Weight	Points	
Color	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 3	6	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 2	2	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 1	2	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+	
	Maximum 21 points		11	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE			
Rating			**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.		12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.		8
Subordinate	The project is of significant size but occupies a minor part of the landscape.		4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.		0
	Single highest points	Maximum 12 points	4
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.			

Table 9 SPATIAL DOMINANCE

Category				Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition .... Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]			**Dominant** 2-3 categories rated prominent = 6 points **Codominant √** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**		
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.		
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.		
	inconspicuous	Canopied,[2] indistinct or obscured landscape.		
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]			
	Rating	**Description**		
	prominent	High Level,[4] High Slope,[4] Interfluve[4]		
	significant	Low Level,[4] Lowslope,[4] Midslope[4]		
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]		
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]			
	Rating	**Description**		
	prominent	All or a significant part of the project will be seen against sky or water.		
	inconspicuous	All or a significant part of the project will be seen against land.		
		Single highest points	Maximum 6 points	4

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY							
Category	For each category check (√) the rating that best describes the existing landscape.						
		Rating					
		High		Moderate		Low	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.	√	Low amount of topographic diversity and variety.	
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.	√	Natural areas of local significance. Man-made structures widespread but not dominant in the view.		Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.	√	Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	**(H)** **M** **L**
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	**(H)** **M** **L**
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	**H** **(M)** **L**
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	**(H)** **M** **L**
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	**H** **M** **(L)**
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	**H** **(M)** **L**
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., an urban fringe, a woodland edge, an alpine tree line, coastline).	**H** **M** **(L)**
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	**H** **M** **(L)**
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	**H** **M** **(L)**
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	**(H)** **M** **L**
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	**Moderate**	√	Moderate	**Conspicuous**	√	
Visibility	**Moderate**	Weak			Apparent		Less Than Significant Effect
		Negligible		Low	Unobtrusive		

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency…." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "… but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, … compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 2 – U.S. Post Office Round Mountain Driveway, Additional View

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Moderate to High	
	Distinctiveness	Low to Moderate	
	Diversity	Low to Moderate	
	Integrity	Low to Moderate	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High		
	Moderate	√	
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	6
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	10

Table 8 SCALE DOMINANCE

Rating		Points
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.	12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.	8
Subordinate	The project is of significant size but occupies a minor part of the landscape.	4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.	0
	Single highest points / Maximum 12 points	4

Table 9 SPATIAL DOMINANCE

Category	Rating	Single Highest Rating	Points
Spatial composition of the landscape.	prominent **significant** inconspicuous	Dominant 2-3 categories rated prominent.	6
Spatial position of the project.	prominent **significant** inconspicuous	**Codominant** 1 category rated prominent, or 2 categories rated significant.	4
Backdrop to the project.	**prominent** inconspicuous	Subordinate 1 category rated significant.	2
		Insignificant All categories rated inconspicuous.	0
		Single highest points / Maximum 6 points	4

Table 10 PROJECT PROMINENCE RATING

Total Points	Rating
32-39	Severe
24-31	Strong
16-23	**Moderate**
8-15	Weak
0-7	Negligible
	Rating ≡ Moderate

VISUAL ABSORPTION CAPABILITY

Table 11 CAPABIITY
Table 12 ABSORPTION

Rating	Checkbox	
High		The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
Moderate	√	
Low		

Table 13 MAGNITUDE OF CHANGE

		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	√
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS

CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	√

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 2

Table 3 LANDSCAPE CHARACTER

Aesthetic	Description										Check (√) the description that best identifies the aspect of the landscape.
Balance	harmonious		balanced		discordant	√	chaotic				
Complexity	uniform		simple		diverse		complex	√			
Dynamic	sweeping		spreading		disperse	√	channeled				
Enclosure	expansive		open	√	enclosed		constrained				
Pattern	formal		organized		regular	√	random				
Perceptual											
Pleasure	beautiful		attractive		pleasant		unpleasant	√	nasty		
Security	intimate		comfortable		safe	√	unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote		vacant		peaceful		busy	√	
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements in a landscape are what create the aesthetic appeal that an individual responds to when viewing a space.		
Form	angular		curvilinear		horizontal		rounded	√			
Line	straight		curved	√	vertical		horizontal				
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small	√	large		vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36, and Christine Tudor, "An Approach to Landscape Character Assessment, Natural England, October 2014, pp. 42-43.

Table 4 UNITY

Landscape	Rating					Guidance
	High	Moderate to High	Moderate	Low to Moderate	Low	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many	√			few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly			√	muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole			√	remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.

Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate √ Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Design Element	Rating[1]	Weight	Points	
Color	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 3	6	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 2	2	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+	
	Maximum 21 points		10	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE			
Rating			**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.		12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.		8
Subordinate	The project is of significant size but occupies a minor part of the landscape.		4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.		0
	Single highest points	Maximum 12 points	4
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.			

Table 9 SPATIAL DOMINANCE

Category			Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition …. Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]		**Dominant** 2-3 categories rated prominent = 6 points **Codominant √** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**	
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.	
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.	
	inconspicuous	Canopied,[2] indistinct or obscured landscape.	
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]		
	Rating	**Description**	
	prominent	High Level,[4] High Slope,[4] Interfluve,[4]	
	significant	Low Level,[4] Lowslope,[4] Midslope[4]	
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]	
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]		
	Rating	**Description**	
	prominent	All or a significant part of the project will be seen against sky or water.	
	inconspicuous	All or a significant part of the project will be seen against land.	
		Single highest points / Maximum 6 points	4

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY							
Category	For each category check (√) the rating that best describes the existing landscape.						
		Rating					
		High		**Moderate**		**Low**	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.	√	Low amount of topographic diversity and variety.	
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.	√	Natural areas of local significance. Man-made structures widespread but not dominant in the view.		Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.	√	Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	H M (L)
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	H (M) L
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	H (M) L
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	H M (L)
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	H M (L)
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	H (M) L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., an urban fringe, a woodland edge, an alpine tree line, coastline).	H M (L)
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	H M (L)
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	H M (L)
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	(H) M L
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	**Moderate**	√	Moderate	**Conspicuous**	√	
Visibility	**Moderate**	Weak			Apparent		Less Than Significant Effect
		Negligible		Low	Unobtrusive		

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 3 – Montgomery Creek Elementary School Driveway Entrance

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Moderate to High	
	Distinctiveness	Low to Moderate	
	Diversity	Moderate	
	Integrity	Low to Moderate	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High	√	
	Moderate		
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	6
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	4
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	13

Table 8 SCALE DOMINANCE

Rating		Points
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.	12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.	8
Subordinate	The project is of significant size but occupies a minor part of the landscape.	4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.	0
	Single highest points / Maximum 12 points	4

Table 9 SPATIAL DOMINANCE

Category	Rating	Single Highest Rating	Points
Spatial composition of the landscape.	prominent	Dominant 2-3 categories rated prominent.	6
	significant		
	inconspicuous	**Codominant** 1 category rated prominent, or 2 categories rated significant.	4
Spatial position of the project.	prominent		
	significant		
	inconspicuous	Subordinate 1 category rated significant.	2
Backdrop to the project.	**prominent**		
	inconspicuous	Insignificant All categories rated inconspicuous.	0
		Single highest points / Maximum 6 points	4

Table 10 PROJECT PROMINENCE RATING

Total Points	Rating
32-39	Severe
24-31	Strong
16-23	**Moderate**
8-15	Weak
0-7	Negligible
	Rating ≡ Moderate

VISUAL ABSORPTION CAPABILITY

Table 11 CAPABIITY
Table 12 ABSORPTION

Rating	Checkbox	
High		The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
Moderate	√	
Low		

Table 13 MAGNITUDE OF CHANGE

		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	√
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS

CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	√

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 3

Table 3 LANDSCAPE CHARACTER											
Aesthetic	**Description**										Check (√) the description that best identifies the aspect of the landscape.
Balance	harmonious		balanced		discordant	√	chaotic				
Complexity	uniform		simple		diverse	√	complex				
Dynamic	sweeping		spreading		disperse		channeled	√			
Enclosure	expansive		open	√	enclosed		constrained				
Pattern	formal		organized		regular	√	random				
Perceptual											
Pleasure	beautiful		attractive		pleasant		unpleasant	√	nasty		
Security	intimate		comfortable		safe	√	unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote		vacant		peaceful		busy	√	
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements in a landscape are what create the aesthetic appeal that an individual responds to when viewing a space.		
Form	angular		curvilinear		horizontal		rounded	√			
Line	straight		curved	√	vertical		horizontal				
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small		large	√	vast				
Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36, and Christine Tudor, "An Approach to Landscape Character Assessment, Natural England, October 2014, pp. 42-43.											

Table 4 UNITY						
Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many	√			few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly		√		muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole			√	remnant	What patterns in the landscape are evident? Are sections missing and to what extent?
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.						

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.
Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.	

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High √ Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Design Element	Rating[1]	Weight	Points	
Color	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 3	6	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 2	4	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 1	2	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+	
	Maximum 21 points		13	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE			
Rating			**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.		12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.		8
Subordinate	The project is of significant size but occupies a minor part of the landscape.		4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.		0
	Single highest points	Maximum 12 points	4
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.			

Table 9 SPATIAL DOMINANCE

Category				Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition …. Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]			**Dominant** 2-3 categories rated prominent = 6 points **Codominant √** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**		
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.		
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.		
	inconspicuous	Canopied,[2] indistinct or obscured landscape.		
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]			
	Rating	**Description**		
	prominent	High Level,[4] High Slope,[4] Interfluve[4]		
	significant	Low Level,[4] Lowslope,[4] Midslope[4]		
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]		
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]			
	Rating	**Description**		
	prominent	All or a significant part of the project will be seen against sky or water.		
	inconspicuous	All or a significant part of the project will be seen against land.		
		Single highest points	Maximum 6 points	4

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY							
Category	For each category check (√) the rating that best describes the existing landscape.						
		Rating					
		High		**Moderate**		**Low**	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.	√	Low amount of topographic diversity and variety.	
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.	√	Natural areas of local significance. Man-made structures widespread but not dominant in the view.		Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.	√	Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	H **(M)** L
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	H **(M)** L
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	H **(M)** L
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	**(H)** M L
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	H M **(L)**
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	H **(M)** L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., an urban fringe, a woodland edge, an alpine tree line, coastline).	H M **(L)**
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	H M **(L)**
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	H M **(L)**
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	**(H)** M L
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	**Moderate**	√	Moderate	**Conspicuous**	√	
Visibility	**Moderate**	Weak			Apparent		Less Than Significant Effect
		Negligible		Low	Unobtrusive		

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 4 – SR-299 west of Bunch Grass Lookout Road

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Low to Moderate	
	Distinctiveness	Moderate	
	Diversity	Moderate	
	Integrity	Moderate to High	
	Rating	**Checkbox**	Check (**√**) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate	**√**	
	Low		
	None		
Table 6 VISIBILITY	**Dominant**	**√**	
	High		
	Moderate to High		
	Moderate		
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	**Strong = 3**	x 3	9
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	**Strong = 3**	x 2	6
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	**Strong = 3**	x 1	3
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	2
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	20

Table 8 SCALE DOMINANCE

Rating		Points
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.	12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.	8
Subordinate	The project is of significant size but occupies a minor part of the landscape.	4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.	0
	Single highest points / Maximum 12 points	8

Table 9 SPATIAL DOMINANCE

Category	Rating	Single Highest Rating	Points
Spatial composition of the landscape.	prominent	**Dominant**	
	significant	2-3 categories rated prominent.	6
	inconspicuous	Codominant	
Spatial position of the project.	**prominent**	1 category rated prominent, or	
	significant	2 categories rated significant.	4
	inconspicuous	Subordinate	
Backdrop to the project.	**prominent**	1 category rated significant.	2
		Insignificant	
	inconspicuous	All categories rated inconspicuous.	0
		Single highest points / Maximum 6 points	6

Table 10 PROJECT PROMINENCE RATING

Total Points	Rating
32-39	**Severe**
24-31	Strong
16-23	Moderate
8-15	Weak
0-7	Negligible
	Rating ≡ Severe

VISUAL ABSORPTION CAPABILITY

Table 11 CAPABIITY
Table 12 ABSORPTION

Rating	Checkbox	
High		The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
Moderate		
Low	√	

Table 13 MAGNITUDE OF CHANGE

		Checkbox
Dominant	Project commands or controls the view in the landscape.	√
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS

CEQA Guidelines Level of Effect on the Environment		
	Significant Effect	√
	Less Than Significant Effect	

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 4

Table 3 LANDSCAPE CHARACTER

Aesthetic	Description										Check (√) the description that best identifies the aspect of the landscape.
Balance	harmonious	√	balanced		discordant		chaotic				
Complexity	uniform		simple	√	diverse		Complex				
Dynamic	sweeping		spreading	√	disperse		channeled				
Enclosure	expansive		open	√	enclosed		constrained				
Pattern	formal		organized		regular	√	random				
Perceptual											
Pleasure	beautiful		attractive	√	pleasant		unpleasant		nasty		
Security	intimate		comfortable	√	safe		unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote		vacant		peaceful	√	busy		
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements in a landscape are what create the aesthetic appeal that an individual responds to when viewing a space.		
Form	angular		curvilinear		horizontal	√	rounded				
Line	straight		curved		vertical		horizontal	√			
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small		large	√	vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36, and Christine Tudor, "An Approach to Landscape Character Assessment, Natural England, October 2014, pp. 42-43.

Table 4 UNITY

Landscape	Rating					Guidance
	High	Moderate to High	Moderate	Low to Moderate	Low	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many			√	few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct		√		indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly		√		muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole	√			remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
√	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.
Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.	

Table 6 VISIBILITY	
Rating	
Dominant √ Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Design Element	Rating[1]	Weight	Points	
Color	**Strong = 3**	x 3	9	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
	Moderate = 2			
	Weak = 1			
	None = 0			
Form	**Strong = 3**	x 2	6	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
	Moderate = 2			
	Weak = 1			
	None = 0			
Line	**Strong = 3**	x 1	3	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
	Moderate = 2			
	Weak = 1			
	None = 0			
Texture	Strong = 3	x 1	2	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Moderate = 2			
	Weak = 1			
	None = 0			
	Overall Rating[9]		+	
	Maximum 21 points		20	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE			
Rating			**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.		12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.		8
Subordinate	The project is of significant size but occupies a minor part of the landscape.		4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.		0
	Single highest points	Maximum 12 points	8
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.			

Table 9 SPATIAL DOMINANCE

Category			Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition .... Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]		**Dominant √** 2-3 categories rated prominent = 6 points **Codominant** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**	
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.	
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.	
	inconspicuous	Canopied,[2] indistinct or obscured landscape.	
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]		
	Rating	**Description**	
	prominent	High Level,[4] High Slope,[4] Interfluve[4]	
	significant	Low Level,[4] Lowslope,[4] Midslope[4]	
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]	
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]		
	Rating	**Description**	
	prominent	All or a significant part of the project will be seen against sky or water.	
	inconspicuous	All or a significant part of the project will be seen against land.	
		Single highest points / Maximum 6 points	6

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY

Category		For each category check (√) the rating that best describes the existing landscape.					
		Rating					
		High		Moderate		Low	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.		Low amount of topographic diversity and variety.	√
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.		Natural areas of local significance. Man-made structures widespread but not dominant in the view.	√	Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.		Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	√
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.		Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.	√	Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	H M (L)
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	H M (L)
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	H M (L)
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	H M (L)
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	H M (L)
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	H (M) L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., an urban fringe, a woodland edge, an alpine tree line, coastline).	H M (L)
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	H M (L)
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	H M (L)
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	(H) M L
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	**Severe**	√	High	**Dominant**	√	Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Moderate**	Moderate		Moderate	Conspicuous		
Visibility	**Dominant**	Weak			Apparent		
		Negligible		Low	Unobtrusive		Less Than Significant Effect

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 5 – Proposed east access road entrance on SR-299

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Moderate	
	Detractors	Low to Moderate	
	Distinctiveness	Moderate	
	Diversity	Moderate	
	Integrity	Moderate to High	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate	√	
	Low		
	None		
Table 6 VISIBILITY	Dominant		
	High	√	
	Moderate to High		
	Moderate		
	Low to Moderate		
	Low		

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	6
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	4
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	2
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	14

Table 8 SCALE DOMINANCE

Rating		Points
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.	12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.	8
Subordinate	The project is of significant size but occupies a minor part of the landscape.	4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.	0
	Single highest points / Maximum 12 points	8

Table 9 SPATIAL DOMINANCE

Category	Rating	Single Highest Rating	Points
Spatial composition of the landscape.	prominent	**Dominant**	
	significant	2-3 categories rated prominent.	6
	inconspicuous	Codominant	
Spatial position of the project.	**prominent**	1 category rated prominent, or	
	significant	2 categories rated significant.	4
	inconspicuous	Subordinate	
Backdrop to the project.	**prominent**	1 category rated significant.	2
		Insignificant	
	inconspicuous	All categories rated inconspicuous.	0
		Single highest points / Maximum 6 points	6

Table 10 PROJECT PROMINENCE RATING

Total Points	Rating
32-39	Severe
24-31	**Strong**
16-23	Moderate
8-15	Weak
0-7	Negligible
	Rating ≡ Severe

VISUAL ABSORPTION CAPABILITY

	Rating	Checkbox	
Table 11 CAPABILITY **Table 12 ABSORPTION**	High		The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
	Moderate		
	Low	√	

Table 13 MAGNITUDE OF CHANGE

		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	√
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS

CEQA Guidelines Level of Effect on the Environment	**Significant Effect**	√
	Less Than Significant Effect	

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 5

Table 3 LANDSCAPE CHARACTER

Aesthetic	**Description**										Check (√) the description that best identifies the aspect of the landscape.
Balance	harmonious	√	balanced		discordant		chaotic				
Complexity	uniform		simple		diverse	√	Complex				
Dynamic	sweeping		spreading	√	disperse		channeled				
Enclosure	expansive		open		enclosed	√	constrained				
Pattern	formal		organized	√	regular		random				
Perceptual											
Pleasure	beautiful		attractive	√	pleasant		unpleasant		nasty		
Security	intimate		comfortable	√	safe		unsettling		threatening		
Stimulus	inspiring		challenging		interesting	√	bland		monotonous		
Tranquility	inaccessible		remote		vacant		peaceful	√	busy		
Basic Design Element											
Color	monochrome		muted	√	colorful		garish		The basic design elements in a landscape are what create the aesthetic appeal that an individual responds to when viewing a space.		
Form	angular		curvilinear		horizontal	√	rounded				
Line	straight		curved		vertical		horizontal	√			
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small		large	√	vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36, and Christine Tudor, "An Approach to Landscape Character Assessment, Natural England, October 2014, pp. 42-43.

Table 4 UNITY

Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare		√		common	Is this landscape unique or familiar in the region or state?
Detractors	many			√	few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct		√		indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly		√		muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole	√			remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
√	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.
Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.	

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High √ Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Design Element	Rating[1]	Weight	Points	
Color	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 3	6	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 2	4	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 1	2	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 **Moderate = 2** Weak = 1 None = 0	x 1	2	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+	
	Maximum 21 points		14	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE			
Rating			**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.		12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.		8
Subordinate	The project is of significant size but occupies a minor part of the landscape.		4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.		0
	Single highest points	Maximum 12 points	8
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.			

Table 9 SPATIAL DOMINANCE

Category				Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition …. Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]			**Dominant √** 2-3 categories rated prominent = 6 points **Codominant** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**		
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.		
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.		
	inconspicuous	Canopied,[2] indistinct or obscured landscape.		
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]			
	Rating	**Description**		
	prominent	High Level,[4] High Slope,[4] Interfluve[4]		
	significant	Low Level,[4] Lowslope,[4] Midslope[4]		
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]		
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]			
	Rating	**Description**		
	prominent	All or a significant part of the project will be seen against sky or water.		
	inconspicuous	All or a significant part of the project will be seen against land.		
		Single highest points	Maximum 6 points	6

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY

Category		For each category check (√) the rating that best describes the existing landscape.					
		Rating					
		High		**Moderate**		**Low**	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.		Low amount of topographic diversity and variety.	√
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.		Natural areas of local significance. Man-made structures widespread but not dominant in the view.	√	Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.		Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.		Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.		Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	√
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.		Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.	√	Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	H M (L)
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	H (M) L
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	H M (L)
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	H M (L)
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	H M (L)
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	H (M) L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., an urban fringe, a woodland edge, an alpine tree line, coastline).	H M (L)
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	H M (L)
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	H M (L)
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	H M (L)
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect / Less Than Significant Effect
Unity	See Table 4	**Strong**	√		**Prominent**	√	
Public View	**Moderate**	Moderate		Moderate	Conspicuous		
Visibility	**High**	Weak		Low	Apparent		
		Negligible			Unobtrusive		

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency...." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "... but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, ... compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

Key Observation Point Evaluation Worksheet
Summary Sheet for Worksheet Tables

Key Observation Point No. 6 – Junction of Main Street and Mountain View Road in Burney

LANDSCAPE			
Table 3 LANDSCAPE CHARACTER	Aesthetic Aspect		See attached Table 3.
	Perceptual Aspect		
	Basic Design Element		
	Landscape	**Rating**	Write the rating selected in the attached Table 4.
Table 4 UNITY	Rarity	Low to Moderate	
	Detractors	Moderate to High	
	Distinctiveness	Moderate	
	Diversity	Low to Moderate	
	Integrity	Low to Moderate	
	Rating	**Checkbox**	Check (√) the rating selected in the attached Tables 5 and 6.
Table 5 PUBLIC VIEW	High		
	Moderate		
	Low	√	
	None		
Table 6 VISIBILITY	Dominant		
	High		
	Moderate to High		
	Moderate		
	Low to Moderate		
	Low	√	

PROJECT PROMINENCE			
Table 7 Basic Design Element Contrast			
Basic Design Element	**Rating**	**Weight**	**Points**
Color	Strong = 3	x 3	3
	Moderate = 2		
	Weak = 1		
	None = 0		
Form	Strong = 3	x 2	2
	Moderate = 2		
	Weak = 1		
	None = 0		
Line	Strong = 3	x 1	1
	Moderate = 2		
	Weak = 1		
	None = 0		
Texture	Strong = 3	x 1	0
	Moderate = 2		
	Weak = 1		
	None = 0		
		Maximum 21 points	6

Table 8 SCALE DOMINANCE

Rating		Points
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.	12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.	8
Subordinate	The project is of significant size but occupies a minor part of the landscape.	4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.	0
	Single highest points / Maximum 12 points	0

Table 9 SPATIAL DOMINANCE

Category	Rating	Single Highest Rating	Points
Spatial composition of the landscape.	prominent	**Dominant**	
	significant	2-3 categories rated prominent.	6
	inconspicuous	Codominant	
Spatial position of the project.	prominent	1 category rated prominent, or	
	significant	2 categories rated significant.	4
	inconspicuous	Subordinate	
Backdrop to the project.	prominent	1 category rated significant.	2
		Insignificant	
	inconspicuous	All categories rated inconspicuous.	0
		Single highest points / Maximum 6 points	2

Table 10 PROJECT PROMINENCE RATING

Total Points	Rating
32-39	Severe
24-31	Strong
16-23	Moderate
8-15	**Weak**
0-7	Negligible
	Rating ≡ Weak

VISUAL ABSORPTION CAPABILITY

Table 11 CAPABILITY
Table 12 ABSORPTION

Rating	Checkbox	
High	√	The existing landscape capability to absorb the physical change by the proposed project without an alteration to its landscape character.
Moderate		
Low		

Table 13 MAGNITUDE OF CHANGE

		Checkbox
Dominant	Project commands or controls the view in the landscape.	
Prominent	Project stands out or is striking in the view in the landscape.	
Conspicuous	Project is clearly visible and noticeable in the view in the landscape.	
Apparent	Project visible or evident in the view in the landscape.	
Unobtrusive	Project indistinct or not obvious in the view in the landscape.	√

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS

CEQA Guidelines Level of Effect on the Environment	Significant Effect	
	Less Than Significant Effect	√

Key Observation Point Evaluation Tables
Full Evaluation Worksheet Tables Displayed

Key Observation Point No. 6

Table 3 LANDSCAPE CHARACTER											
Aesthetic	**Description**								Check (√) the description that best identifies the aspect of the landscape.		
Balance	harmonious		balanced		discordant		chaotic	√			
Complexity	uniform		simple		diverse		complex	√			
Dynamic	sweeping		spreading		disperse	√	channeled				
Enclosure	expansive		open		enclosed		constrained	√			
Pattern	formal		organized		regular	√	random				
Perceptual											
Pleasure	beautiful		attractive		pleasant		unpleasant	√	nasty		
Security	intimate		comfortable		safe	√	unsettling		threatening		
Stimulus	inspiring		challenging		interesting		bland	√	monotonous		
Tranquility	inaccessible		remote		vacant		peaceful		busy	√	
Basic Design Element											
Color	monochrome		muted		colorful	√	garish		The basic design elements in a landscape are what create the aesthetic appeal that an individual responds to when viewing a space.		
Form	angular	√	curvilinear		horizontal		rounded				
Line	straight		curved		vertical	√	horizontal				
Texture	smooth		textured	√	rough		very rough				
Scale	intimate		small	√	large		vast				

Adapted from Carys Swanwick, "Landscape Character Assessment Guidance for England and Scotland," prepared for The Countryside Agency and Scottish Natural Heritage, 2002, pp. 30-36, and Christine Tudor, "An Approach to Landscape Character Assessment, Natural England, October 2014, pp. 42-43.

Table 4 UNITY						
Landscape	**Rating**					**Guidance**
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**	
Rarity	rare			√	common	Is this landscape unique or familiar in the region or state?
Detractors	many	√			few	Are there man-made and/or natural landscape features out of place?
Distinctiveness	distinct			√	indistinct	Is it easy to remember this landscape? Are patterns dramatic or take detecting?
Diversity	orderly			√	muddled	Is there a recognizable order to the landscape features or are too many patterns overlapping?
Integrity	whole			√	remnant	What patterns in the landscape are evident? Are sections missing and to what extent?

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 36.

Table 5 PUBLIC VIEW	
Rating	
High	
	Public view includes areas where the aesthetic value is protected by federal, state, county or city, law, ordinance, regulation, or standard. Public view includes federal, state, county, city designated areas of aesthetic, cultural, and recreational claim, such as: a park, outdoor recreation area, etc.; coastal or forest reserve, open space preserve, urban green space, etc.; scenic overlook, scenic river, scenic trail, etc.; historic building, district, or site; a site having a cultural resource. Public view includes a federal or state designated scenic byway, highway, or road; designated scenic highway or road of regional importance; a segment of travel route, such as a road, rail line, pedestrian and equestrian trail, bicycle path near a designated area of aesthetic claim and leading directly to it. View approaching an area of aesthetic, cultural, and recreational claim that may be closely related to the appreciation of the aesthetic, cultural, and recreational significance at that designation. Public view includes an urban residential use area and segment of road that serves as the primary access route to it.
Moderate	
	Public view includes undesignated but popularly used or appreciated area of aesthetic, cultural, and recreational claim of significance in the region. Public view includes a highway or road locally designated as a scenic route and of importance only to the local population, or informally designated as such in road atlases, road maps, and tour book guides. Public view includes segments of travel routes, such as roads, pedestrian and equestrian trails, bicycle paths that are near and are the primary access to a popularly used undesignated area important for their aesthetic, cultural, or recreational claim. Public view includes a segment of travel route near a designated area of aesthetic claim serving as a secondary access route to the area. Public view includes a rural residential use area and segment of road that serves as the primary access route to it within one mile. Public view includes a maintained religious facility or cemetery.
Low	
√	Public view includes an agricultural, commercial, industrial, manufacturing, research and development intensive land use area. Public view includes a small aggregation of dwellings.
None	
	No public view.

Adapted from Aspen Environmental Group, "Final Environmental Impact Report Tranquillon Ridge Oil and Gas Development Project" prepared for County of Santa Barbara Planning and Development. Santa Barbara, CA, April 2008, Vol. 1, pp. 5.13-5-6, and "Final Environmental Impact Report Southern California International Gateway Project," Appendix B Aesthetics Visual Resource Methodology, Los Angeles Harbor Department, Los Angeles, CA, March 2013.

Table 6 VISIBILITY	
Rating	
Dominant Dominates view because project would fill most of visual field for views in its general direction. Stark contrast in form, line, color, texture, luminance, or motion may contribute to view dominance.	An object with strong visual contrast that is of such enormous size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head greater than 45 degrees from a direct view of the object. The object is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of the project detracts noticeably from views of other landscape components.
High Strongly attracts visual attention of views in general direction of project. Attention may be drawn by stark contrast in form, line, color, or texture, luminance, or motion.	An object that is not of enormous size, but contrasts with the surrounding landscape components so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to stark contrast in form, line, color, and texture, bright light sources, and moving objects associated with the project may contribute substantially to drawing viewer attention. The visual prominence of project interferes noticeably with views of nearby landscape components.
Moderate to High Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of project.	An object that is obvious and with enough size or contrast to compete with other landscape components, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
Moderate Visible after brief glance in general direction of project and unlikely to be missed by casual observer.	An object that can be easily detected after a brief look and would be visible to most casual observers, but without enough size or contrast to compete with major landscape components.
Low to Moderate Visible when scanning in general direction of project; otherwise, likely to be missed by casual observer.	An object that is exceedingly small and/or faint, but when the observer is scanning the horizon or looking more closely at an area can be detected without extended viewing. A casual observer could sometimes notice it; however, most people would not notice it without some active looking.
Low √ Visible only after extended, close viewing; otherwise, invisible.	An object that is near the extreme limit of visibility. A person who was not aware of it in advance and looking for it could not see it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period.
Adapted from R.G. Sullivan, L.B. Kirchler, T. Lahti, S. Roche, K. Beckman, B. Cantwell, P. Richmond, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes," University of Chicago Argonne, LLC submitted to the National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012, p. 17.	

Table 7 BASIC DESIGN ELEMENT CONTRAST

Design Element	Rating[1]	Weight	Points	
Color	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 3	3	Color is "the light-reflecting qualities of a project's surface (for example, dark or light, blue or gray) in relation to background colors."[2] "Colors that harmonize well seem to belong together and produce pleasing visual effects. Colors that do not harmonize are disturbing to the viewer."[3] Contrast in color depends on the exterior surface degree of lightness or darkness, gradation or variety of a color, the degree of saturation or brilliance of a color in the project to those that continue to exist in the landscape.
Form	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 2	2	Form is "the configuration and outline of the project in terms of masses, patterns, and linear elements. For example, a structure may have a bulky, vertical, geometric silhouette which contrasts with an irregular horizontal landscape of rolling hills."[4] Forms exist in three dimensions (height, length, width). For instance, the shape is a square its form is a cube. Forms that are bold, regular, solid, or vertical tend to prevail in the landscape. Contrast in form depends on how alike the form(s) of the project is to those that continue to exist in the landscape.
Line	Strong = 3 Moderate = 2 **Weak = 1** None = 0	x 1	1	"Line is the path, real or imagined that the eye follows when perceiving abrupt differences when objects are aligned in a one-dimensional sequence."[5] "Line in the landscape is created by the edge between two materials, the outline or silhouette of a form, or a long linear feature."[6] Properties of lines include: straight, diagonal, curve, vertical, horizontal. Contrast in line depends on edge types and interruption, or introduction of edges, bands, and silhouette lines in the project to those that continue to exist in the landscape.
Texture	Strong = 3 Moderate = 2 Weak = 1 **None = 0**	x 1	0	Texture is "the aggregation of small forms or color mixtures into a continuous surface pattern; the aggregated parts are enough that they do not appear as discrete objects in the composition of the scene."[7] "Details of the surface pattern, as in smooth polished metal surfaces versus the rough, uneven textures of the foliage of trees and bushes"[8] Contrast in texture depends on the relative dimensions of the surface variations from large to small, spacing of surface variations, and the degree of uniform recurrence and symmetrical arrangement of the surface variation in the project to those that continue to exist in the landscape.
	Overall Rating[9]		+	
	Maximum 21 points		6	

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, CA, 1979.

[1] **Strong** — the project contrast demands attention will not be overlooked and is dominant in the landscape. **Moderate** — the project contrast begins to attract attention and begins to dominate the characteristic landscape. **Weak** — the project contrast can be seen but does not attract attention. **None** — the project contrast is not visible or perceived. (U.S. Department of Interior Bureau of Land Management Manual 8431-Visual Resources Contrast Rating, January 17, 1986.)

[2] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[3] U.S. Department of Transportation Federal Highway Administration, "A Guide to Visual Quality in Noise Barrier Design," Chapter 3. Visual Design Principles, n.d.

[4] Sheppard, p. 46.

[5] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[6] Gail Hansen, "Basic Principles of Landscape Design." Florida Cooperative Extension Service Institute of Food and Agricultural Science, University of Florida, Gainesville, Florida, July 2010.

[7] U.S. Department of Interior Bureau of Land Management Manual 8431-1 Visual Resources Contrast Rating, January 17, 1986.

[8] Sheppard, p. 47.

[9] Overall Rating is for descriptive purpose: Strong — 1-3 ratings Strong or 3 ratings Moderate; Moderate — 1-2 ratings Moderate with no higher ratings; Weak — 1-3 ratings Weak with no higher ratings; None — all ratings None.

Table 8 SCALE DOMINANCE			
Rating			**Points**
Dominant	The project is the major object in the landscape and occupies a large part of the landscape.		12
Codominant	The project is one of the major objects in the landscape or is the major object or area in a panoramic landscape.		8
Subordinate	The project is of significant size but occupies a minor part of the landscape.		4
Insignificant	The project is a small object occupying an exceedingly small area in the landscape.		0
	Single highest points	Maximum 12 points	8
Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.			

Table 9 SPATIAL DOMINANCE

Category			Single Highest Rating
Spatial composition of the landscape	"[T]he arrangement of objects and voids in the landscape can be categorized by their spatial composition .... Some compositions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifications than others, depending upon how strongly the spatial configuration draws the eye to certain locations."[1]		**Dominant √** 2-3 categories rated prominent = 6 points **Codominant** 1 category rated prominent, or 2 categories rated significant = 4 points **Subordinate** 1 category rated significant = 2 points **Insignificant** All categories rated inconspicuous = 0 points
	Rating	**Description**	
	prominent	Feature[2], Focal[2], or Enclosed[2] landscape.	
	significant	Panoramic,[2] or weak focal, feature or enclosed landscape.	
	inconspicuous	Canopied,[2] indistinct or obscured landscape.	
Spatial position of the project	"Spatial position of the project in relation to the three-dimensional arrangement of objects and voids in the landscape. Important spatial aspects of the project include relationship to the skyline, location in topographic spaces such as focal valleys or broad plains, and position with regard to streetscapes and architectural arrangements."[3]		
	Rating	**Description**	
	prominent	High Level,[4] High Slope,[4] Interfluve[4]	
	significant	Low Level,[4] Lowslope,[4] Midslope[4]	
	inconspicuous	Basin Floor,[4] Footslope,[4] Toeslope[4]	
Backdrop to the project	"[T]he backdrop against which an object is seen affects its visual contrast. Modifications seen against the sky or water are usually more prominent than against a land backdrop."[5]		
	Rating	**Description**	
	prominent	All or a significant part of the project will be seen against sky or water.	
	inconspicuous	All or a significant part of the project will be seen against land.	
	Single highest points	Maximum 6 points	2

Adapted from R.C. Smardon, Donald Appleyard, "Prototype Visual Impact Assessment Manual," Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 1979.

[1] U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.

[2] **Canopied** — landscape where features overhead (above eye level) create a canopy or ceiling. **Enclosed** — a space, large or small surrounded by continuous grouping of objects creating walls and floor. It may have a large vertical dimension, but typically a restricted horizontal one. **Feature** — landscape dominated by a feature or a group of objects in the distance to which the eye is drawn. **Focal** — converging lines in the landscape or progressions of aligned objects lead the eye to a focal point in the landscape. **Panoramic** — a broad horizontal composition. Little or no sense of boundary restriction; no apparent limit to the view. Foreground or middle ground objects do not substantially block viewing of background objects. (U.S. Department of Interior Bureau of Land Management Manual H-8431-1 Visual Resources Contrast Rating, January 17, 1986.)

[3] Stephen R.J. Sheppard, *Visual Simulation A User's Guide For Architects, Engineers, And Planners*, Van Nostrand Reinhold, New York, 1989, p. 46.

[4] **Basin Floor** — nearly level to gently sloping, bottom surface of an intermontane basin. **Footslope** — the gently inclined hillslope at the foot of a hill. **High Level** — level top of plateau. **High Slope** — geomorphic part that forms the uppermost inclined surface at the top of a slope (e.g., shoulder slope, upper slope). **Interfluve** — linear top of ridge, hill or mountain. **Low Level** — valley floor, or shoreline being the former position of an alluvial plain, lake, or shore. **Lowslope** — inner gently inclined surface at the base of a slope. Surface profile is generally concave and a transition between midslope or backslope, and toeslope. **Midslope** — intermediate slope position between high and low (e.g., middle slope). (Adapted from T. Liang [1951]; J.B. Dalrymple, R.J. Blong, and A. Conacher. [1968]) **Toeslope** — the gently inclined surface at the base of a hillslope. Toeslope in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors. (USDA Soil Survey Manual Handbook No. 18, issued March 2017 as amended February 2018).

[5] U.S. Department of Interior Bureau of Land Management Manual H-8431-1.

Table 11 CAPABILITY

Category		For each category check (√) the rating that best describes the existing landscape.					
		Rating					
		High		Moderate		Low	
Topography		High amount of topographic diversity and variety.		Moderate amount of topographic diversity and variety.		Low amount of topographic diversity and variety.	√
Land Use Pattern	If project in rural landscape	Small natural or vegetated areas. Man-made structures dominant in the view.		Natural areas of local significance. Man-made structures widespread but not dominant in the view.		Remote natural areas of regional significance. Man-made structures and features limited and scattered.	
	If project in urban landscape	Developed areas including commercial development. Large-scale infrastructure or structures may be common and more dominant.	√	Suburban or mostly developed areas with components of local importance. Large-scale infrastructure or structures may be visible but not dominant.		Clustered development surrounded by rural scattered development. Large-scale infrastructure or structures limited and scattered.	
Visual Variety		Landscape exhibits a high degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit high degree of variety in landforms and vegetation.	√	Landscape exhibits a moderate degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit moderate variety in landforms and vegetation.		Landscape exhibits a low degree of visual variety in terms of the landscape basic elements of form, line, color and texture may also exhibit minimal variety in landforms and vegetation.	
Major Focal Points or Features		Focal points or features in the viewshed that are either natural or man-made, commonly found, minimal local importance/value, or contribute little to the character of the landscape or are indistinct.	√	Focal points or features in the viewshed that are either natural or man-made, somewhat commonly found, local importance/value, or make a minor contribution to the character of the landscape.		Focal points or features in the viewshed that are either natural or man-made and are unusual or rare, regional importance/value, or make a major contribution to the character of the landscape or are somewhat distinctive.	

Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 17, and L. Blocker, T. Slider, J. Ruchman, J. Mosier, L. Kok, J. Silbemagle, J. Beard, D. Wagner, G. Brogan, D. Jones, N. Laughlinn, L. Anderson, "Landscape Aesthetic (AH 701-i) - Visual Absorption Capability (Appendix C)," United States Department of Agriculture Forest Service, 1995, pp. C-1-C-8.

Table 12 ABSORPTION	
Circle the applicable rating for the proposed project in the existing landscape; High = H, Moderate = M, Low = L.	
Exposure	**Rating**
What is the level of exposure of the project in the landscape? The higher the level of exposure the lower the absorption.	(H) M L
What is the intensity of the observation of the project? The more the project is observed from certain intensive land uses the lower its absorption (e.g., view from a densely populated residential area versus a heavy manufacturing area).	(H) M L
What is the view distance to the project? The farther the viewing distance to the project from the vantage point the lower its exposure the higher its absorption. Is the project more than three miles away?	(H) M L
What is the project distance from an urban skyline or a natural skyline (e.g., high-rise buildings or a mountain range against a backdrop of sky)? The closer the project is to an urban or natural skyline the lower its absorption.	(H) M L
What is the project topographic position in the landscape? As the project position increases its absorption decreases (e.g., toeslope to summit).	H (M) L
Focal Point	
Is the project near a focal point in the landscape? A focal point is a converging of lines in the landscape or progressions of aligned objects that lead the eye to a point. A focal point gives the viewer something interesting to look at in the view. The closer the project is to a focal point, the greater viewer scrutiny, the lower the absorption.	(H) M L
Does the edge(s) in the landscape have a diverse background but have the propensity to become a focal point? An edge is a transitional linear place where one space or landscape becomes part of another. An edge has a high absorption due to a diverse background, a low absorption due to the propensity to become a focal point (e.g., an urban fringe, a woodland edge, an alpine tree line, coastline).	H (M) L
Trees & Vegetation	
Are trees and vegetation in the landscape missing, deficient, or uniform? The greater the density of trees and vegetation, the greater the coverage, the greater the capacity of an area to absorb physical change.	(H) M L
What is the type(s) of tree(s) and vegetation in the landscape? Tree and vegetation types vary the absorption of the physical change. A uniformly tall, dense stand of trees has screening ability. Vegetation types such as evergreen shrubs and similar have greater absorption than dwarf shrubs, ornamental grasses, and grass-like plants. Trees and vegetation can provide high absorption in the foreground but lower absorption in the background.	(H) M L
Disturbed Surface Area	
What is the period of time to restore the project disturbed surface area to its pre-construction activity condition? The longer the time to restore the disturbed area to its undisturbed original condition, the lower the absorption; 1 year = high, 2 to 3 years = moderate, 3 years or more = low.	(H) M L
Adapted from S. Amir, E. Gidalizon, "Expert-based method for the evaluation of visual absorption capacity of the landscape*," Journal of Environmental Management, 1990, Vol. 30, pp. 251-263, and W.C. Yeomans, "A Proposed Biophysical Approach to Visual Absorption Capability (VAC),[1]" Pacific Southwest Forest and Range Experimental Station, Berkeley, California, 1979 submitted to the National Conference on Applied Techniques for Analysis and Management of Visual Resource, Incline Village, Nevada, April 23-25, 1979, pp. 172-181.	

Table 13 MAGNITUDE OF CHANGE				
Dominant	**Prominent**	**Conspicuous**	**Apparent**	**Unobtrusive**
Project commands or controls the view in the landscape. Project causes a very large alteration to the landscape or features within the landscape such that there is a fundamental change from the existing physical environment.	Project stands out or is striking in the view in the landscape. Project causes a large alteration to the landscape or features within the landscape such that there is an unmistakable change from the existing physical environment.	Project is clearly visible and noticeable in the view in the landscape. Project causes a moderate alteration to the landscape or features within the landscape such that there is a distinct change from the existing physical environment.	Project visible or evident in the view in the landscape. Project causes a small alteration to the landscape or features within the landscape such that there is a perceptible change from the existing physical environment.	Project indistinct or not obvious in the view in the landscape. Project causes a very small alteration to the landscape, or features within the landscape such that there is a de minimis change from the existing physical environment.
Adapted from Cape Cod Commission Technical Bulletin #12-001: Visual Impact Assessment Methodology for Offshore Development, Cape Cod Commission, Barnstable, Massachusetts, May 10, 2012, p. 20.				

Table 14 VISUAL CHARACTER OR QUALITY OF PUBLIC VIEW OF SITE AND ITS SURROUNDINGS							
Landscape		**Project Prominence**		**Visual Absorption Capability**	**Magnitude Of Change**		**CEQA Guidelines Level Of Effect On The Environment** (See Table 15)
Table	**Rating**	**Rating**		**Rating**			
Landscape Character	See Table 3	Severe		High	Dominant		Significant Effect
Unity	See Table 4	Strong			Prominent		
Public View	**Low**	Moderate		Moderate	Conspicuous		
Visibility	**Low**	**Weak**	√		Apparent		
		Negligible		Low	**Unobtrusive**	√	Less Than Significant Effect

Table 15 CEQA GUIDELINES LEVEL OF EFFECT ON THE ENVIRONMENT

Significant Effect on the Environment "means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance." (14 CCR § 15382) (Pub. Res. Code § 21060.5, 14 CCR § 15360) The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the [lead] agency…." (14 CCR § 15064.7[a])

Less Than Significant Effect with Mitigation Incorporated. The physical change by the proposed project to the existing physical environment reaches the threshold of significance, "… but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed [CEQA environmental document (e.g., Negative Declaration) is] released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Pub. Res. Code § 21064.5, 14 CCR § 15369.5) (Pub. Res. Code § 21002)

Less Than Significant Effect. The physical change by the proposed project to the existing physical environment does not reach the threshold of significance "an identifiable, quantitative, qualitative or performance level of a particular environmental effect, … compliance with which means the effect normally will be determined to be less than significant." (14 CCR § 15064.7[a])

5.16 Water Resources

5.16.1 Environmental Setting

The project would be located in a rural portion of Shasta County, approximately 30 miles northeast of Redding, California, and 7 miles west of Burney California. The project as currently revised would consist of up to 48 wind turbines, support facilities covering approximately 475 acres, and would disturb approximately 868 acres during construction (Stantec 2021). State Route 299 (SR 299) passes along the northeast portion of the project area. According to the Shasta County map viewer website, the majority of the project area is zoned as timber production with the remainder designated as unclassified (Shasta County 2023).

Stormwater Drainage and Water Quality

Stormwater from the proposed project area would drain into the following level 12 Hydrologic Unit Code (HUC) watersheds (DWR 2023d):

- Hatchet Creek (HUC 180200031102)
- Montgomery Creek (HUC 180200031103)
- Cedar Creek (HUC 180201510301)
- Upper Little Cow Creek (HUC 180201510302)

These tributaries ultimately drain into the Sacramento River, approximately 30 miles southwest of the project area. According to the United States Environmental Protection Agency (USEPA) *How's My Waterway* website, only one of the four HUC 12 watersheds, Upper Little Cow Creek, is listed as impaired. The water quality of the Upper Little Cow Creek watershed is affected by metals (USEPA 2023a).

Based on the application Streams and Waterbodies Maps 1 through 3, the project includes (12) existing and (3) new stream crossings, as well as roadways passing near (5) steam headwater areas (Stantec 2023b).

The project area would intersect SR-299 at two project entrances (Mileposts SHA-62.3 and SHA-67.3) and would border SR-299 adjacent to the south side of the roadway along a 2.4-mile segment between mileposts SHA-65.1 and SHA-67.5 (CalTrans 2023).

Since the 1870s, the general project area has been used for logging and is currently zoned almost entirely as timberland production (Shasta County 2023). Logging practices can affect surface water quality due to increased sediment from erosion. This is also true of wildfires which occur occasionally in the region. The Fountain Fire of 1992 which burned 63,960 acres, was the last wildfire that affected the project area. This fire consumed all but the very southeastern portion of the project area (CAL FIRE, 2023a). Currently, the project area is located within a very high fire severity zone under California State jurisdiction (CAL FIRE, 2023b).

Due to the layout of the project area primarily consisting of access roads and utility trenches, the project would be considered a linear underground project (LUP) under California's National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) administered by the State Water Resources Control Board (SWRCB). According to the United States Department of Agricultural (USDA) Web Soil Survey, the soil cover within the project area ranges from clay loam to very sandy cobbly loam, with less than 5 percent exposed rock outcrop (USDA 2023).

Using the Revised Universal Soil Loss Equation (RUSLE), a site-specific undisturbed average annual soil loss value in tons/acre/year has been estimated based on the following parameters:

- Rainfall Erosivity Factor (R-Factor) from the Rainfall Erosivity Factor Calculator for Small Construction Sites website (USEPA 2023b).
- Soil Erodibility Factor (K-Factor) from the Natural Resource Conservation Service (NRCS) Web Soil Survey (USDA 2023).
- Slope Length/Steepness Factor (LS-Factor) from Google Earth profiles.
- Cover Management Factor (C-Factor), which includes native vegetation from the Draft User's Guide, Revised Universal Soil Loss Equation Version 2 form (USDA 2008).

The estimated average annual soil loss is 14.4 tons/acre/year for an undisturbed site and would be considered a low soil loss risk. The RUSLE2 computer application developed by the USDA was also used to predict the average annual soil loss during construction at 21 tons/acre/year (USDA 2022). This would represent an annual soil loss of 9,975 tons per year given the active proposed project area of 475 acres (Stantec 2021) and would be considered a medium soil loss risk.

Groundwater

Groundwater in the project area is contained within the fractures, tuff beds, rubble zones, lava flow tops, volcanic pipes, and interbedded sand layers of Tertiary and Quaternary volcanic rock (Shelton et al. 2013). The nearest recognized groundwater basins are Goose Valley (7 miles to the northeast), Burney Creek Valley (9 miles to the east) and Dry Burney Creek Valley (4 miles to the southeast) (DWR 2023b).

Fluctuations in rainfall, changing drainage patterns, and other hydrologic factors can influence groundwater levels. Depth to groundwater varies greatly within the project area. A review of well completion reports for 15 domestic water wells installed between 1966 and 2014 indicates that first encountered groundwater ranged from 20 to 210 feet below ground surface (bgs) and averaged 108 feet bgs, while static groundwater levels ranged from 10 to 239 feet bgs and averaged 95 feet bgs (DWR 2023e).

Flooding

The proposed project area is located within Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) panel 06089C1025G, which is noted as within the Shasta County Unincorporated Areas Zone X. Zone X is defined as areas determined to be outside the 0.2 percent annual chance (or 500-year recurrence interval) floodplain (FEMA 2011, FEMA 2021)

The project area is also not within an area mapped as vulnerable to sea level rise in the National Oceanic and Atmospheric Administration's (NOAA) *Digital Coast, Sea Level Rise Viewer* (NOAA 2023).

According to the *Dam Breach Inundation Map Web Publisher* sponsored by the California Department of Water Resources (DWR), there are no dams in the region that could cause inundation of the project area. The nearest reservoir to the project area is Haynes Reservoir (approximately 2.5 miles east); however, in the event of dam failure, inundation would occur to the east away from the project area (DWR 2023a).

Since the project area is not located near the coast or a large body of water, there is no danger of a tsunami or seiche.

Regulatory

Federal

Clean Water Act and California's Porter-Cologne Water Quality Control Act. The SWRCB and its nine Regional Water Quality Control Boards (RWQCBs) are responsible for the regulation and enforcement of the water quality protection requirements of the federal Clean Water Act (CWA) and the state's Porter-Cologne Water Quality Control Act (Porter-Cologne). The NPDES is the permitting program that allows point source dischargers to comply with the CWA and Porter-Cologne laws. This regulatory framework protects the beneficial uses of the state's surface and groundwater resources for public benefit and environmental protection. Protection of water quality could be achieved by ensuring the proposed project complies with applicable NPDES permits from the SWRCB or the Central Valley RWQCB (CVRWQCB).

Section 404(a) of the CWA identifies the U.S. Army Corp of Engineers (USACE) as the authority to issue permits for the discharge of fill and dredging material into navigable waters, defined as waters of the United States (CWA Section 502 [7]). According to Figure 2 of the Project Refinement Memo, there are an estimated 84 locations (Stantec 2021) that might be under USACE jurisdiction. Under Section 401(a) of the CWA, any applicant of a permit under the CWA must provide a State certification to the Federal permitting agency. In California, the CVRWQCB is the Section 401 certifying agency.

Under Section 303(d) of the CWA, states are required to identify impaired surface water bodies and develop total maximum daily loads (TMDLs) for contaminants of concern. The TMDL is the quantity of pollutant that can be assimilated by a water body without

violating water quality standards. Only one of the four HUC 12 watersheds in the project area, the Upper Little Cow Creek watershed is listed by the EPA as Impaired Waters for California according to Section 303(d) List of the Clean Water Act. The water quality of the Upper Little Cow Creek watershed is impaired with metals only (USEPA 2023a). Listing of a water body as impaired does not necessarily suggest that the water body cannot support the beneficial uses; rather, the intent is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for future water quality degradation.

Processing and Bottling of Drinking Water (21 CFR Part 129). This Federal regulation pertains to the bottling of drinking water. 21 CFR 129.3 defines an approved source of drinking water. 21 CFR 129.40 establishes requirements for equipment that comes in contact with drinking water such as tanks.

Federal Emergency Management Agency Flood Insurance Program. The magnitude of flood used nationwide as the standard for floodplain management is a flood having a probability of occurrence of one percent in any given year, also known as the 100-year flood, or base flood. FIRM, the official map created and distributed by FEMA for the National Flood Insurance Program that shows areas subject to inundation by the base flood for participating communities. FIRMs contain flood risk information based on historic, meteorologic, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development. As stated above, the proposed project area is located in Zone X and therefore is outside the 0.2 percent annual chance floodplain.

State

Sustainable Groundwater Management Act (AB 1739, SB 1168 & SB 1319). The 2014 Sustainable Groundwater Management Act (SGMA) requires local public agencies and Groundwater Sustainability Agencies (GSAs) in high and medium priority basins to develop and implement Groundwater Sustainability Plans (GSPs) or Alternatives to GSPs. GSPs are detailed road maps for how groundwater basins will be managed to reach long-term sustainability.

The project area is underlain by a bedrock aquifer and is not within a groundwater basin; therefore, no GSA exists. The closest groundwater basin is Goose Valley. The Goose Valley groundwater basin is very low priority and is also not under the jurisdiction of a GSA (DWR 2023c).

California Health and Safety Code, Section 111120. Per this section of the California Health and Safety Code a program to license private water source operators and water haulers was established and administered by the California Department of Public Health (CDPH).

Local Agency Management Program for Onsite Wastewater Treatment Systems. The Federal CWA, the California Water Code, and the Porter-Cologne Act

authorizes SWRCB and associated regional boards to regulate discharges that could impact surface and groundwater. SWRCB in turn delegates this authority to local agencies with respect to onsite wastewater treatment systems (OWTS) through the Local Agency Management Program (LAMP). The Shasta County Environmental Health Division (SCEHD) is the local agency responsible for OWTS such as septic systems (Shasta County 2019). A septic system to serve the operations and maintenance (O&M) building is proposed as part of the project.

Local

Shasta County General Plan. The following objectives and policies apply to hydrology and water quality (Shasta County 2004):

- 5.1 Seismic and Geologic Hazards
  - ***SG-4 -*** Protection of waterways from adverse water quality impacts caused by the development on highly erodible soils.
  - ***SG-d -*** Develop and maintain standards for erosion and sediment control plans.
- 5.2 Flood Protection
  - ***FL-1 -*** Regulate land use and construction design for development within a floodplain to protect public health and safety.
- 6.6 Water Resources
  - ***W-9 -*** Institute effective measures to protect groundwater quality from potential adverse effects of increased pumping or potential sources of contamination.
  - ***W-a -*** Minimize sedimentation and erosion from proposed developments through grading and hillside development County ordinances and safeguards.
  - ***W-b -*** Prevent contamination of streams, creeks, rivers, reservoirs, or groundwater basins by designing septic systems, waste disposal sites, and other sources of hazardous or polluting materials in accordance with County standards and water resource management plans.
  - ***W-c -*** All proposed land divisions and developments in Shasta County shall have an adequate water supply of sufficient quantity and quality for the planned uses.

Shasta County Code 8.52.110. As part of Shasta County's ordinances regarding temporary housing, squatting, and unlawful camping, this County Code requires that a well for potable water supply should be covered to prevent "dipping" and properly banked to prevent contamination from surface runoff.

Shasta County Code 12.12.070. This County Code establishes the following Stormwater related requirements for grading permits:

- A grading permit requires an erosion control plan during and after the completion of the project.

- A wet weather operation and erosion plan if winter season work (October 15th to May 1st) is allowed by permit.
- A wet weather closure plan if a project is not completed by October 15 and winter season work is not allowed by permit.

Cumulative

The proposed project may have a cumulative impact when the incremental effect of the project is considerable when viewed in connection with other past, present, and reasonably foreseeable future projects. (Public Resource Code [PRC] Section 21083; California Code of Regulations [CCR] Title 14, Sections 15064[h], 15065[c], 15130, and 15355).

With respect to water resources, the proposed project could cause cumulative impacts due to erosion and groundwater extraction. The areas adjacent to the project are zoned for timber production. If logging activities are occurring at the time of project construction, the project could result in a cumulative impact from erosion resulting from stormwater runoff in addition to stormwater erosion resulting from timber harvesting.

5.16.2 Environmental Impacts

WATER RESOURCES Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?[1]	☐	☐	☐	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces in a manner which would:				
i. result in substantial erosion or siltation, on- or offsite;	☐	☒	☐	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. create or contribute runoff water	☐	☐	☒	☐

1 Note: Impact Unknown

WATER RESOURCES Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or				
iv. impede or redirect flood flows?	☐	☐	☒	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐
f. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☒	☐	☐
g. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☒	☐	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, hydrology and water quality and utilities and service systems.

5.16.2.1 Methodology and Thresholds of Significance

The California Environmental Quality Act (CEQA) guidelines, Appendix G, provide a checklist of questions that lead agencies typically address when assessing impacts related to water resources (or hydrology and water quality in CEQA). To assess potential impacts concerning water resources, staff has reviewed online sources of maps, literature and information of the surrounding area, as well as site-specific information provided by the project applicant. Specific quantitative thresholds of significance are not applicable to this evaluation.

5.16.2.2 Direct and Indirect Impacts

a. Would the project violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction

Less Than Significant with Mitigation Incorporated. The proposed project would disturb approximately 868 acres of land during construction and be subject to construction-

related stormwater requirements of the Construction General Permit. Prior to any ground-disturbing construction activity, the applicant would prepare a construction Stormwater Pollution Prevention Plan (SWPPP) to comply with the Construction General Permit. With the implementation of the SWPPP, development of the site would not cause substantial degradation in the quality, or an increase in the rate or volume, of stormwater runoff from the site during construction.

According to the application project description, soil would be excavated to a maximum depth of 15 feet below grade while installing turbine foundations (Stantec 2020b). It is therefore possible that groundwater could be encountered during excavation activities and dewatering would be necessary. If dewatering is necessary, and the discharge is found to be uncontaminated, the project owner would be allowed to discharge dewatering water to waters of the US under the Construction General Permit. If the discharge is found to be contaminated, a special permit through the CVRWQCB would be necessary depending on the nature of the contamination, requiring the applicant to treat the water before discharging or hauling away the untreated water by a permitted service provider.

The applicant proposes two mitigation measures that would address water quality degradation:

- MM 3.12-1 would incorporate best management practices (BMPs) to mitigate the impact of stormwater runoff resulting from construction activities within 50 feet of a waterway.
- MM 3.12-2 would follow blasting BMPs if necessary to assist with trenching and excavation activities during project construction, to mitigate the impact of blasting chemical agents to surface water and groundwater.

Staff concurs with these mitigation measures which would be incorporated into the condition of certification (COC) **WATER-1**.

Thus, the project would not be expected to violate water quality standards or waste discharge requirements during construction, and impacts would be less than significant with mitigation.

Operation

Less Than Significant with Mitigation Incorporated. During project operation, applicable erosion controls that were installed during construction would be maintained throughout the project area. A project operations SWPPP should be prepared to monitor stormwater events and associated BMPs. The project would include an on-site septic system to serve the O&M building. Under Public Resources Code section 25545.1(b)(2) the CVRWQCB retains its authority to regulate septic systems under its jurisdiction. In this case authority to regulate septic systems is delegated to the Shasta County Environmental Health Department (SCEHD) through the Local Agency Management Program (LAMP).

Because of the project's remote location, the project cannot connect to a public wastewater treatment system. The project proposes to use an onsite septic system. A properly designed septic system would ensure that impacts to the environment would be less than significant with mitigation. However, the soil type identified by the USDA's Web Soil Survey website for the O&M building site (Windy and McCarthy stony sandy loams) is noted as having a very limited rating with respect to wastewater disposal by infiltration (USDA 2023) and may not support a typical leach field type septic system

The project owner would perform percolation tests to assess the leachability of the proposed leach field area and then consult the SCEHD to determine if the project's septic system design and site conditions would conform with OWTS requirements. COC **WATER-7** would ensure that the project's septic system conforms with the requirements set forth by SWRCB and SCEHD. The project would not be expected to violate water quality standards or waste discharge requirements during operation, and impacts would be less than significant with mitigation.

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The original water supply assessment (WSA) prepared for the project identified two alternatives for water supply: 1) On-site groundwater extraction, and 2) imported water from the Burney Water District (BWD) (Stantec 2020a). On September 21, 2023, the BWD Board of Directors voted unanimously to deny the applicant's request to purchase water for project construction (BWD 2023). A revised water supply report (WSR) was prepared due to the loss of BWD water supply and was submitted to the docket on March 18, 2024 (TN 255154). The WSR proposed the following sources for water supply: 1) Groundwater trucked in from an off-site source, and 2) On-site groundwater extraction (Stantec 2024b). In response to CEC staff queries regarding the specific groundwater source, the applicant submitted a second revision to the WSR on May 15, 2024 (TN 256386). The latest WSR identified Hat Creek Construction & Materials, Inc. (HCC) as the supplier of water during construction and possibly during operation. Included in the WSR is a letter from HCC dated May 8, 2024, confirming that HCC has sufficient water supply to serve the project's construction and operational needs. In response to a comment letter regarding the application (Shasta County 2024), the applicant stated that water from HCC wells would not be used as potable water during project operations (Stantec 2024c).

Construction

Less Than Significant Impact. In the revised WSR submitted on May 15, 2024 (TN 256386), the applicant identified HCC, a private company, as the off-site water purveyor (Stantec 2024b) located close to the community of Burney Falls, approximately 21.6 miles from the project site by roadway. HCC submitted a Letter of Intent to provide non-potable water during project construction, and potable water for

project operations if needed (HCC 2024). Water provided by HCC would be transported to the project site by truck.

Staff reviewed Department of Water Resources (DWR) well completion reports of the three HCC water supply wells, and two other domestic wells that are within half a mile of the HCC facility (DWR 2023e). HCC wells No. 1, No. 2, and No. 3 have initial yields of 4,300 gallons per minute (GPM) with a drawdown of 3 feet, 1,400 GPM with a 0.75-foot drawdown, and 800 GPM with a drawdown of 12.5 feet, respectively. Although these wells were installed during 1955 and 1956, there is no basis to conclude that groundwater conditions have substantially changed in light of the lack of development in the area and the consistent amount of annual precipitation. The two offsite domestic wells installed in 1968 were not pump tested, however, a comparable yield to HCC well No. 3 is expected because these wells were completed in a similar formation and at similar depths.

It is expected that the proposed construction water demand of 310 acre-feet (AF) over the 28-month construction period, or about 120,410 gallons per day, would have minimal impact on HCC water supply. Also, trucking water to the site would eliminate the impact to site groundwater during construction.

Therefore, the impact during project construction to water resources would be less than significant.

Operation

Impact Unknown. As stated in the “Environmental Setting” subsection, groundwater at the project area is within fractured volcanic rock instead of an alluvial aquifer and groundwater storage conditions are unknown (Stantec 2020a). While preparing the original WSR, Stantec reviewed the DWR completion reports for (9) wells within a 2-mile radius of the proposed extraction well, noting that the yield of these wells varied from 6 to 60 GPM (Stantec 2024a). Staff reviewed the available water well completion records from DWR (DWR 2023e). These wells were installed between 1967 and 2014 and were completed at depths between 64 and 220 feet below ground surface. Under the worst water yield (6 GPM), it would take an estimated 211 days of pumping continuously without running the well dry to produce the 5.6 acre-feet per year (AFY) for operations. As noted, the local groundwater resource has not been assessed, thus staff cannot determine whether the proposed onsite well would be able to provide adequate supply for operations or impact nearby existing wells. Therefore, the impacts from the proposed well are unknown.

As a potable water alternative to onsite groundwater extraction, HCC indicated it could supply the necessary 5.6 AFY needed during project operations (HCC 2024). However, as stated above, HCC would not be providing potable water during project operations. Moreover, HCC is not currently licensed as a private water source per California Health and Safety Code section 111120. In order for a water supplier to be able to provide potable water to the project during operations it would need to be licensed as a private

water source operator through the program administered by CDPH per California Health and Safety Code Section 111120.

For the purpose of this analysis, staff assumes that only local groundwater would be used as water supply during project operations. Staff also notes that the applicant has not identified an alternative source of water even though it is not known if local groundwater is available in sufficient amounts to meet operational project demand. Therefore, because of the lack of necessary information to assess the impacts of using onsite wells, as described in subsection 5.16.4 "Conclusions and Recommendations", staff is not able to determine the environmental impacts of operational water use.

c. 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 through the addition of impervious surfaces in a manner which would:

i. Result in substantial erosion or siltation, on- or offsite;

Construction and Operation

Less Than Significant with Mitigation Incorporated. The project would be designed to maintain onsite drainage patterns as a priority. Soil disturbance activities such as vegetation clearing, tree removal and grading would be necessary to construct access roads, project facilities, wind turbine foundations and create 2-acre buffers surrounding turbine sites. Project access roads would be designed to follow contours and minimize roadcuts. Culverts at stream crossings would be sized to allow for conveyance during a 100-year storm event. A SWPPP prepared in compliance with Construction General Permit requirements would ensure impacts from erosion and siltation associated with soil disturbance activities are minimized by the implementation of appropriate BMPs, which would continue to be maintained during operation. The RUSLE2 computer application predicts only a medium soil loss risk during project construction. In addition, COCs **WATER-4** and **WATER-5** would address any impacts to local waterways.

Thus, impacts would be less than significant with mitigation.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

Construction and Operation

Less Than Significant Impact. Surface runoff from the proposed project would be controlled as described in criterion "a" and "c(i)" above. Therefore, impacts would be less than significant.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

Construction and Operation

Less Than Significant Impact. As the project area is located within a rural setting, there are no existing storm drainage systems. The Construction General Permit SWPPP requirements would ensure impacts from erosion and siltation associated with soil disturbance activities are minimized by the implementation of appropriate BMPs, which would continue to be maintained during operation. In addition, culverts at stream crossings would be sized to allow for conveyance during a 100-year storm event. Therefore, impacts would be less than significant.

iv. Impede or redirect flood flows?

Construction and Operation

Less Than Significant Impact. According to the FEMA FIRM 06089C1025G (effective March 17, 2011) the project area is located entirely within Zone X (FEMA 2011). Zone X is defined as areas determined to be outside the 0.2 percent (or 500-year) annual chance floodplain (FEMA 2021). The project area also is not within an area mapped as vulnerable to sea level rise in the NOAA's Digital Coast, Sea Level Rise Viewer (NOAA 2023). As described in criterion "c(i)" above, culverts at stream crossings would be sized to allow for conveyance during a 100-year storm event. The proposed project would not be expected to add significantly to the existing potential to impede or redirect flood flows because project design accommodates for increased stream water flow following existing drainage patterns.

Therefore, significant obstruction or redirection of flood water is not expected from the proposed project and the impacts would be less than significant.

d. Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Construction and Operation

No Impact. As described in criterion "c (i)", the project area is located entirely within Zone X and is not within an area mapped as vulnerable to sea level rise in the NOAA's *Digital Coast Sea Level Rise Viewer*. In addition, according to DWR's *Dam Breach Inundation Map Web Publisher,* there are no dams in the region that could cause inundation of the project area. Since the project area is not located near the coast or a large body of water, there is no danger of a tsunami or seiche.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Construction and Operation

Less Than Significant Impact. Due to the remote location of the project area, the Basin Plan administered by the CVRWQCB is the only applicable water quality control plan. With the implementation of the construction SWPPP required in COC **WATER-1**, the objectives of the Basin Plan would be fulfilled. Since the project area is underlain by a bedrock aquifer and not a recognized groundwater basin, no GSAs exist and no GSP has been prepared. In addition, the aquifer that HCC would extract groundwater from is also not a recognized groundwater basin, with no GSAs or GSPs.

Therefore, there would be no conflicts with water quality control plans and groundwater management plans from the proposed project and the impacts would be less than significant.

f. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Construction

Less Than Significant Impact. As discussed in criterion "b", water for project construction would be trucked in from HCC groundwater extraction wells. It is expected that the proposed construction water demand of 310.4 acre-feet (AF) over the 28-month construction period, or about 120,410 gallons per day, would have minimal impact on the HCC water supply.

Therefore, the impact during project construction is less than significant.

Operation

Less Than Significant with Mitigation Incorporated. Given the remote rural environment of the project area, future development is not anticipated.

As discussed in criterion "b", the selected option for project water supply would be groundwater extraction. The storage capacity and resiliency of the volcanic rock aquifer is unknown and therefore the ability for groundwater extraction to supply water during drought conditions cannot be estimated. Likewise, the impact of project groundwater extraction on other local water users during times of drought is difficult to assess.

As discussed in criterion "b", the applicant originally included HCC as an option for supplying potable water but has since stated that HCC water would not be used as potable water during project operation (Stantec 2024c).

g. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Construction

No Impact. Due to the rural location, no wastewater treatment provider is available to serve the project. During construction, temporary sanitary facilities would be used. Therefore, project construction would not result in a wastewater impact.

Operation

Less Than Significant with Mitigation Incorporated. Due to the rural location, no wastewater treatment provider is available to serve the project. See subsection (a) for a discussion on the project's proposed septic system. The project as proposed would include a septic system to service wastewater produced by the O&M building. As discussed in criteria "a", the applicant would need to obtain a permit for a septic system through SCEHD and the feasibility of such a system would be evaluated.

The applicant would be required to comply with septic system design requirements per COC **WATER-7** and therefore project operations would not be expected to violate water quality standards or waste discharge requirements, and impacts would be less than significant with mitigation.

5.16.2.3 Cumulative Impacts

Less Than Significant with Mitigation Incorporated. The proposed project may have a cumulative impact if the incremental effect of the project is considered with other past, present, and reasonably foreseeable future projects. (PRC Section 21083; California CCR Title 14, Sections 15064[h], 15065[c], 15130, and 15355). Due to the remote and rural nature of the project location, future development in the area is not anticipated. With respect to water resources, the proposed project could produce cumulative impacts due to erosion and groundwater extraction. The project area is zoned for timber production. If logging occurs during project construction, a cumulative impact due to erosion could result from stormwater runoff through areas of both project construction and nearby timber harvesting. Condition of Certification **WATER-4** would address any possible impacts related to timber harvesting.

By incorporating aspects of Condition of Certification **WATER-4,** cumulative impacts would be less than significant.

5.16.3 Project Conformance with Applicable LORS

Table 5.16-1 presents staff's determination of conformance with applicable local, state and federal laws, ordinances, regulations, and standards (LORS), including any proposed conditions of certification, where applicable, to ensure the project would comply with LORS. As shown in the table, staff concludes that with implementation of

specific conditions of certification, the proposed project would be consistent with all applicable LORS. The subsection, "Staff Proposed Conditions of Certification" below contains the full text of the referenced conditions of certification.

TABLE 5.16-1 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis For Determination
Federal	
Clean Water Act (33 USC, §1251 et seq.)	**Yes.** With the implementation of Conditions of Certification **WATER-1** thru **WATER-5** and **WATER-7**.
Federal Emergency Management Agency Flood Insurance Program	**Yes.** The proposed project area is located in Zone X and therefore is outside 0.2 percent annual chance floodplain.
State	
Sustainable Groundwater Management Act (AB 1739, SB 1168 & SB 1319)	**N/A**. The project area and location of HCC wells are underlain by a bedrock aquifer and is not within a groundwater basin; therefore, no groundwater sustainability agencies exist.
Local Agency Management Program (LAMP) for Onsite Wastewater Treatment Systems (OWTS)	**Yes.** As the designated agency, the SCEHD would evaluate septic system. Septic system design would comply with SWCRB/SCEHD OWTS requirements per COC **WATER-7**.
Local	
Shasta County General Plan: • *SG-4* - Protect waterways from adverse water quality impacts caused by soil erosion. • *SG-d* - Develop standards for erosion and sediment control plans. • *FL-1* **-** Regulate land use and construction design within a floodplain to protect public health and safety. • *W-9* - Protect groundwater quality from adverse effects of increased pumping or sources of contamination. • *W-a* - Minimize sedimentation and erosion from proposed developments. • *W-b* - Prevent contamination of surface water or groundwater basins using septic system design standards. • *W-c* - Require all proposed land development to have an adequate water supply of sufficient quantity and quality.	**Yes.** The Construction General Permit would require the preparation of a SWPPP that would include the implementation of best practices and BMPs to minimize stormwater erosion and prevent water pollution. These practices and BMPs would continue during project operation. Project infrastructure would not be located within a floodplain. Septic system design would comply with SWCRB/SCEHD OWTS requirements per COC **WATER-7**.
Shasta County Code Chapter 8.56 Water Wells	**Yes.** Per Condition of Certification **WATER-8,** groundwater extraction wells would comply with Shasta County ordinance requiring a supply of water safe for human consumption.
Shasta County Code 12.12.070: • Grading permit requires an erosion control plan.	**Yes.** The Construction General Permit would require the preparation of a SWPPP that would include the implementation of best practices and BMPs. Precautions would be taken during the

TABLE 5.16-1 CONFORMANCE WITH APPLICABLE LORS	
Applicable LORS	**Conformance and Basis For Determination**
• A wet weather operation/erosion plan is required if permitted during the winter season. • A wet weather closure plan is required if the project is not completed by the winter season and is not permitted to work through the season.	winter season per the requirements of the Shasta Count grading permit.

5.16.4 Conclusions and Recommendations

Staff has identified two components of the project related to water resources that may not be viable due to the lack of additional information or action that would be needed for a determination to be made. These two components include the use of an onsite septic system to process wastewater during project operation, and whether an onsite groundwater well would be able to satisfy the operational water demand of 5.6 AFY.

The soil at the O&M building site where the septic system would be constructed was identified as Windy and McCarthy stony sandy loams. This soil type is noted as having a very limited rating with respect to wastewater disposal by infiltration (USDA 2023). Therefore, the project would not meet requirements of the local designated permitting agency for a septic system at the project site.

The project proposes to use a new onsite groundwater extraction well to supply operational potable water. The information provided by the applicant regarding an onsite well does not provide adequate analysis to characterize the groundwater resource and establish whether the well could meet operational needs or impact any neighboring wells. An aquifer characterization study would be needed to properly assess viability of the groundwater resource and the impact of the project extraction on neighboring well users.

Staff made numerous data requests for groundwater characterization data; however, the applicant never performed the needed aquifer characterization studies which would entail the following elements:

1. Identification of all possible water supply wells that could be affected by project groundwater extraction within a 1/2-mile radius area from the proposed extraction well.
2. Installation of a sufficient number of groundwater test wells in the vicinity of the proposed operations and maintenance (O&M) facility. The locations and total depths of the wells have to be determined to accomplish the following:
    a. Determine the groundwater gradient and flow velocity.
    b. Perform aquifer testing such as pump or slug tests to assess adequacy of the resource to meet project needs and to assess impact of project pumping on the nearest private groundwater supply wells.

c. Staff cannot determine the environmental impact of the project's use of onsite wells without the additional aquifer characterization.

Regarding water supply, the applicant provided a letter from HCC that indicates the ability to supply the required 5.6 AFY needed during project operations as an alternative to the onsite well. However, in response to comments from Shasta County, the applicant informed the county that HCC would not be providing potable water during project operations (Stantec 2024c). The California Health and Safety Code contains requirements for certifying a private water source used as drinking water. To the extent the applicant seeks potable water from a private water source, that entity will need to be properly licensed.

To the extent feasible, staff assessed the environmental impacts of the project as proposed assuming a septic system could be installed and the viability of onsite groundwater extraction as the operational water supply. If either of these project components changes, staff may have to revisit its analysis.

As discussed above, with the implementation of COCs, the project would have a less than significant impact related to water resources and would conform with applicable LORS. Staff recommends adopting the conditions of certifications as detailed in subsection 5.16.5, "Proposed Conditions of Certification", below.

5.16.5 Proposed Conditions of Certification

The following proposed Conditions of Certifications include measures to ensure conformance with applicable LORS.

NPDES CONSTRUCTION PERMIT REQUIREMENTS

WATER-1 The project owner shall manage stormwater pollution from project construction activities by fulfilling the requirements contained in State Water Resources Control Board's (SWRCB's) NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit) (Order No. 2022-0057-DWQ, NPDES No. CAS000002) and all subsequent revisions and amendments. Among the requirements of the General Permit, the project owner shall file permit registration documents electronically using the Stormwater Multiple Applications and Report Tracking Systems (SMARTS), submit a Notice of Intent (NOI), and develop and implement a construction Stormwater Pollution Prevention Plan (SWPPP) for the construction of the project (Construction SWPPP). The SWPPP shall include all applicable best management practices (BMPs) for the project construction activities conducted in the local environment. These should include the BMPs suggested by the project owner as mitigation measures 3.12-1 and 3.12-2. The SWPPP must be prepared by a State-Qualified SWPPP Developer (QSD). In addition, the SWPPP shall also satisfy stormwater and erosion control measures of the Shasta County General Plan and the requirements of the Shasta County grading permit.

Verification: At least thirty (30) days prior to site mobilization, the project owner shall submit to the Compliance Project Manager (CPM) proof that the construction permit was granted and that a waste discharge identification number (WDID) was issued by the SWRCB. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the SWRCB or the Central Valley Regional Water Quality Control Board (CVRWQCB) about the General Permit for discharge of stormwater associated with this activity. This information shall include the NOI, the notice of termination, and any updates to the construction SWPPP. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report. Any monitoring documentation associated with the SWPPP shall be included in the annual compliance report.

OPERATIONS STORMWATER POLLUTION PREVENTION PLAN

WATER-2 Prior to project operations, the project owner shall obtain CPM approval of an operations SWPPP following the requirements and procedures of the General Construction Permit (Operations SWPPP). Applicable stormwater BMPs used during project construction shall be retained and maintained during project operations, as well as BMPs specific to project operations.

Verification: The project owner shall submit a copy of the Operations SWPPP to the CPM for review and approval. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report. Any monitoring documentation associated with the SWPPP shall be included in the annual compliance report.

NPDES INDUSTRIAL PERMIT REQUIREMENTS

WATER-3 Due to the inclusion of temporary cement batch plants (SIC 3273) within the project, the project owner shall apply for coverage under the SWCRB's NPDES General Permit for Stormwater Discharges Associated with Industrial Activities (Industrial General Permit) (Order No. WQ 2018-0028-DWQ, NPDES No. CAS000001) prior to the start of project construction. The project owner shall develop and implement an industrial SWPPP (industrial SWPPP) for the operation of the Fountain Wind Project cement batch plants. The project owner shall provide the CPM with a copy of all permit documentation sent to the CVRWQCB.

Verification: At least 30 days prior to site mobilization, the project owner shall submit to the CPM documentation that all necessary NPDES permits were obtained from the CVRWQCB. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence with the SWRCB or CVRWQCB regarding the Industrial General Permit for the discharge of stormwater associated with cement batch plants. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report. Any monitoring documentation associated with the SWPPP shall be included in the annual compliance report.

WASTE DISCHARGE REQUIREMENTS FOR TIMBERLAND MANAGEMENT

WATER-4 The project owner shall apply for coverage under the CVRWQCB's General Order of Waste Discharge Requirements for Timberland Management on Federal and Non-Federal Lands (Timberland Management General Order) (Order No. R5-2017-0061) prior to the start of project construction. The project owner shall comply with all monitoring and reporting requirements associated with the Timberland Conversion Permit and CVRWQCB Timberland Management General Order. The project owner shall provide the CPM and CalFire with a copy of all permit documentation sent to the CVRWQCB.

Verification: At least 30 days prior to site mobilization, the project owner shall submit to the CPM a copy of the information submitted under the CVRWQCB Timberland Management General Order. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence with CalFire or the CVRWQCB regarding the Timberland Management General Order. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report. Any associated monitoring documentation shall be included in the annual compliance report.

COMPLIANCE WITH CLEAN WATER ACT SECTIONS 404 AND 404

WATER-5 The project shall require work that could impact wetlands and waterways including (12) existing and (3) new stream crossings. Therefore, the project owner shall require a Section 401 Water Quality Certification from the CVRWQCB. In addition, even though an aquatic resources survey report and a lake or streambed alteration agreement (LSAA) were provided in the original EIR application, the project owner shall request a verification of the aquatic resource delineation by the U.S. Army Corps of Engineers (USACE) to determine whether the waters of the United States would be impacted by the project.

Verification: At least 30 days prior to site mobilization, the project owner shall submit to the CPM documentation that a Section 401 Water Quality Certification was obtained from the CVRWQCB and that an aquatic resource delineation by the USACE. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence with the CVRWQCB and USACE regarding the Section 401 Water Quality Certification or the aquatic resource delineation. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report. Any documentation associated with CWA Section 401 and 404 shall be included in the annual compliance report.

COORDINATION WITH CALTRANS CONCERNING INTERFACE WITH SR 299

WATER-6 The project shall include two entrances to State Route 299 (SR 299), as well as border SR 299 for 2.4 miles along the northwest portion of the project area. Therefore, the project owner shall submit a drainage report to the California

Department of Transportation (CalTrans), District 2 that describes design elements that shall mitigate stormwater impacts to SR 299.

Verification: At least thirty (30) days prior to site mobilization, the project owner shall submit a copy of the drainage report to the CPM and proof that the drainage report has been submitted to CalTrans. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and Caltrans regarding drainage issues along SR 299. The project owner shall notify the CPM in writing of any reported non-compliance and include these in the annual compliance report, as well as a copy of the drainage report.

ONSITE SEPTIC SYSTEM PERMIT REQUIREMENTS

WATER-7 The project owner shall submit to the Shasta County Environmental Health Division (SCEHD) for review and comment, site-specific design parameters for installing a septic system at the project site. If determined to be appropriate for site conditions, the septic system design shall be submitted to the CPM for approval. The septic system design shall comply with the SWRCB's onsite wastewater treatment system (OWTS) regulations (California Code of Regulations, title 27). The project owner shall operate the septic system following an operations and maintenance manual prepared by a qualified professional per SWCRB OWTS policy (SWCRB 2023). The project owner shall monitor the septic system for detectable effects on groundwater or surface water consistent with the requirements of the approved operations and maintenance manual.

Verification: Within three days of completing percolation testing of the proposed leach field area, the project owner shall provide the analysis results to the CPM. Within three days of receipt, the project owner shall submit to the CPM a copy of the SCEHD comments on the septic system design and a copy of the SCEHD approved operations and maintenance manual. Any testing results or correspondence between the project owner and the California Department of Health Services or the SCEHD during operation shall be included in the annual compliance report. Any testing results that show a violation of the septic system OWTS requirements or regulations shall be reported to the CPM within 24 hours.

WATER USE AND REPORTING

WATER-8 Water supply for project construction shall be provided by Hat Creek Construction & Materials, Inc. (HCC). To address the lack of information regarding the onsite groundwater resource to meet operational needs, the owner shall provide verification of a viable potable water supply prior to the start of operation.

Project water use for construction shall not exceed 310 acre-feet and operational water use shall not exceed 5.6 AFY. The project owner shall record daily project water use and shall identify the water source.

Verification: At least 30 days prior to the start of project construction and water delivery, the project owner shall submit to the CPM a water agreement executed with HCC During project construction, the monthly compliance report shall include a summary of monthly water use. At least 30 days prior to the start of project operation, the owner shall provide documentation that verifies an adequate and safe source of potable water.

The project's annual compliance report shall include a monthly and annual summary of construction and operational water use identifying the water source. After the first year of operation, the annual compliance report shall include the annual water consumption for previous years.

5.16.6 References

BWD 2023 – Burney Water District (BWD). Burney Water District Board of Director's Regular Meeting Minutes. September 21, 2023. Available online https://www.burneywater.org/files/4515683c9/BWD+Minutes+092123+Regular+Mtg.pdf

CAL FIRE 2023a – California Department of Forestry and Fire Protection (CAL FIRE). CAL FIRE Wildfire Perimeters and Prescribed Burns. Accessed on January 18, 2024. Available online at: https://gis.data.ca.gov/datasets/CALFIRE-Forestry:california-fire-perimeters-all-1/explore?location=37.442493%2C-118.992700%2C6.98

CAL FIRE 2023b – California Department of Forestry and Fire Protection (CAL FIRE). Fire Hazard Severity Zone Viewer. Accessed on January 18, 2024. Available online at: https://egis.fire.ca.gov/FHSZ/

CalTrans 2023 – California Department of Transportation (CalTrans). Postmile Services map interface. Accessed on February 1, 2024. Available online at: https://postmile.dot.ca.gov/PMQT/PostmileQueryTool.html?

DWR 1981 – Department of Water Resources (DWR). Water Well Standards: State of California Bulletin 74-81. December 1981. Accessed on: February 9, 2024. Available online at: https://www.countyofglenn.net/sites/default/files/Environmental_Health/WP_DWR_Bulletin_74-81.pdf

DWR 1991 – Department of Water Resources (DWR). California Well Standards, Water Wells, Monitoring Wells, Cathodic Protection Wells, Bulletin 74-90 (Supplement to Bulleting 74-81). June 1991. Accessed on: February 9, 2024. Available online at: https://www.shastacounty.gov/sites/default/files/fileattachments/environmental_health/page/2898/california-well-standards-bulletin-74-90.pdf

DWR 2023a – Department of Water Resources (DWR). Dam Breach Inundation Map Web Publisher. Accessed on: January 18, 2024. Available online at: https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2

DWR 2023b – Department of Water Resources (DWR). Groundwater Basin Boundary Assessment Tool. Accessed on January 18, 2024. Available online at: https://gis.water.ca.gov/app/bbat/

DWR 2023c – Department of Water Resources (DWR). GSA Map Viewer. Accessed on January 18, 2024. Available online at: https://sgma.water.ca.gov/webgis/index.jsp?appid=gasmaster&rz=true

DWR 2023d – Department of Water Resources (DWR). Water Management Planning Tool. Accessed on: January 18, 2024. Available online at: https://gis.water.ca.gov/app/boundaries/

DWR 2023e – Department of Water Resources (DWR). Well Completion Report Map Application. Accessed on: January 18, 2024. Available online at: https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37

FEMA 2011 – Federal Emergency Management Agency (FEMA). Flood Insurance Rate Map (FIRM), Shasta County, California, and Incorporated Areas, Panel 1025 of 2325. Map No. 06089C1025G, effective March 17, 2011. Accessed on: January 18, 2024. Available online at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&extent=-121.9026729380225,37.39865747819159,-121.88739507547326,37.40718029041653

FEMA 2021 – Federal Emergency Management Agency (FEMA). FEMA's National Flood Hazard Layer (NFHL) Viewer. Data refreshed December 2021. Accessed on: January 18, 2024. Available online at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&extent=-121.9026729380225,37.39865747819159,-121.88739507547326,37.40718029041653

HCC 2024 – Hat Creek Construction & Materials (HCC). Letter of Intent to Provide Construction and Operational Water to the Fountain Wind Project. Dated May 8, 2024. Attached to Response to California Energy Commission Data Requests on Water Supply Report and Revised Traffic Report (TN 256385). Dated May 15, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

NOAA 2023 – National Oceanic and Atmospheric Administration (NOAA). Digital Coast, Sea Level Rise Viewer. Accessed on: January 18, 2024. Available online at: https://coast.noaa.gov/slr/#/layer/slr/10/13581756.874679431/4498150.719796521/13/satellite/none/0.8/2050/interHigh/midAccretion

Shasta County 2004 – Shasta County Planning Division (Shasta County). Shasta County General Plan, amended September 2004. Accessed on April 4, 2023. Available

online at: https://www.shastacounty.gov/planning/page/general-plan

Shasta County 2019 – Shasta County Environmental Health Division (Shasta County). Shasta County OWTS Technical Standards Manual. Adopted August 12, 2019. Accessed on January 24, 2024. Available online at: https://www.shastacounty.gov/environmental-health/page/onsite-wastewater-treatment-systems

Shasta County 2023 – Shasta County GIS Division (Shasta County). Shasta County Map Viewer. Accessed on January 18, 2024. Available online at: https://maps.shastacounty.gov/ShastaCountyMap/

Shelton et al. 2013 – Shelton, J.L., Fram, M.S., and Belitz, K., 2013, Groundwater-quality data in the Cascade Range and Modoc Plateau study unit, 2010: Results from the California GAMA Program: U.S. Geological Survey Data Series 688, 124 p. Accessed on January 18, 2024. Available at: https://pubs.usgs.gov/ds/688/

Stantec 2020a – Stantec Consulting Services, Inc. (Stantec). (TN 248320-1). Water Supply Assessment. Dated June 8, 2020. Accessed on March 30, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2020b – Stantec Consulting Services, Inc. (Stantec). (TN 248288-2). DEIR Description of Project and Alternatives. Dated July 2020. Accessed on March 30, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2021 – Stantec Consulting Services, Inc. (Stantec). (TN 248330-2). Project Refinement Memo. Dated September 21, 2021. Accessed on October 12, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023b – Stantec Consulting Services, Inc. (Stantec). (TN 250302). Figure WR-007, Streams and Waterbodies Map 1 thru 3. Dated May 5, 2023. Accessed on October 12, 2023. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024a – Stantec Consulting Services, Inc. (Stantec). (TN 255154). Water Supply Report, Fountain Wind Project. Dated March 15, 2024. Accessed on March 18, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2024b – Stantec Consulting Services, Inc. (Stantec). (TN 256386). Water Supply Report, Fountain Wind Project, Version 3. Dated May 15, 2024. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

SWRCB 2023 – State Water Resources Control Board (SWCRB). OWTS Policy, Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems. April 18, 2023. Accessed on September 24, 2024. Available online at:

https://www.waterboards.ca.gov/water_issues/programs/owts/docs/adopted_owts_policy.pdf

USDA 2008 – United States Department of Agriculture (USDA). USDA, Draft User's Guide, Revised Universal Soil Loss Equation Version 2, (RUSLE2). May 15, 2008. Accessed on January 18, 2024, Available online at: https://www.ars.usda.gov/ARSUserFiles/60600505/RUSLE/RUSLE2_User_Ref_Guide.pdf

USDA 2022 – United States Department of Agriculture (USDA). Agricultural Research Center, Revised Universal Soil Loss Equation 2 - Download RUSLE2. Accessed on March 13, 2023. Available online at: https://www.ars.usda.gov/southeast-area/oxford-ms/national-sedimentation-laboratory/watershed-physical-processes-research/research/rusle2/revised-universal-soil-loss-equation-2-download-rusle2/

USDA 2023 – United States Department of Agriculture (USDA). USDA, Natural Resource Conservation Service (NRCS) Web Soil Survey. Accessed on January 18, 2024. Available online at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

USEPA 2023a – United States Environmental Protection Agency (USEPA). How's My Waterway? EPA website. Accessed on January 18, 2024. Available online at: https://mywaterway.epa.gov/state/CA/water-quality-overview

USEPA 2023b – United States Environmental Protection Agency (USEPA). Rainfall Erosivity Factor Calculator for Small Construction Sites website. Accessed on January 18, 2024. Available online at: https://lew.epa.gov/

5.17 Forestry Resources

5.17.1 Environmental Setting

Existing Conditions

The project site consists of existing timberlands owned by Shasta Cascade Timberlands (SCT), and is surrounded by timberlands owned by SCT and by Sierra Pacific Industries (SPI). Forest resources managed by the U.S. Forest Service, Lassen National Forest, are located near the southeast corner of the project site. Both SCT and SPI utilize similar management of timberlands with even-aged silviculture resulting in a patchwork of clear cuts at various stages of development. The U.S. Forest Service lands have old growth characteristics with large trees and dense overstory and understory.

In 1992, the Fountain Fire burned approximately 700 acres of the 2,855-acre project site (including 32 of the 48 proposed sites for wind turbines) at high severity, impacting the vast majority of timber resources within the burned area. The majority of the burned trees were salvage logged or felled in place. Large decks of trees and tops resulting from this salvage operation are still present within the project area. Approximately 17 million conifer seedlings were planted including, Ponderosa pine *(Pinus ponderosa)*, white fir *(Abies concolor)*, and Douglas fir *(Pseudotsuga mensiesii)*, with incense cedar *(Calocedrus decurrens)* planted along stream buffers. Trees were planted at a very high rate of +400 trees per acre (10 ft. x 10 ft. spacing), resulting in overstocked plantations, limiting tree growth, and creating a fire hazard. These timber stands currently average 3.2 MBF/acre[1] (FWPA, TN 251438). Growth regulator herbicides have been used to control brush, such as Manzanita (*Arctostaphylos sp*.) and *Ceanothus sp*. However, brush has become established in the burned area.

Within the project site, the reforested areas of the Fountain Fire (approximately 1,775 acres) along with the current even-aged silviculture system (approximately 740 acres) have created a patchwork of primarily even-aged, dense, early seral Sierra Mixed Conifer (SMC) stands with Ponderosa pine *(Pinus ponderosa)*, Sugar pine *(P. lambertiana)*, white fir *(Abies concolor)*, Douglas fir *(Pseudotsuga mensiesii)*, incense cedar *(Calocedrus decurrens)*, and California black oak *(Quercus kelloggii),* with pockets of lodgepole pine *(Pinus contorta)* at higher elevations and along watercourses. These trees are interspersed with small patches of second growth “natural” stands of Sierran Mixed Conifer (approximately 318 acres of the project site), and smaller amounts of mixed montane chaparral, mixed montane riparian forest/scrub, and various riparian plant communities along the numerous watercourses that bisect the project area. This description of existing forest resources is based on National Agriculture Imagery Program (NAIP) imagery, information provided by staff biologists, and a site visit on

1 MBF is a forestry term that means “1,000 board feet.” M = Roman Numeral = 1,000 and BF = board feet.

April 23, 2024. For further discussion about habitats within the project site, see **Section 5.2**, **Biological Resources**.

The current landowner, SCT, acquired the project area and surrounding property in 2017 from Roseburg, an industrial timber company based in Oregon that was established in 1936. Roseburg managed timber resources in and adjacent to the project area using primarily even-aged silviculture (clear cut) with some uneven-aged silviculture (selection and shelterwood removal). Since 2017, FWS Forestry Services California, LLC (FWS Forestry) has managed forest resources within the project area for the landowner and has implemented primarily even-aged clear cut timber harvests within the project area. For further discussion of the applicant's lease agreements with the current landowner, see **Section 5.8, Land Use and Agriculture**.

Per the Z'berg-Nejedly Forest Practice Act of 1973, any timber harvest on private lands must be preceded by the preparation of a Timber Harvesting Plan (THP) by a State-Registered Professional Forester. The THP is then submitted to the State Department of Forestry and Fire Protection (CAL FIRE) for review and approval. **Table 5.17-1** provides a list of all THPs that have been approved for the project area within the past 25 years, and the permitted timber harvest activities that have occurred under those THPs.

Site Quality. Timberland is rated for productivity based upon its ability to produce wood growth on trees. Per California Public Resource Code, section 4528(d), the productive potential of timberland is graded and placed in one of five classes (i.e., I through V) by California Board of Forestry and Fire Protection regulation,[2] consistent with normally accepted forestry practices based on the capacity to grow repeated crops of industrial wood (CA BOF 2024a). The classification is based on the maximum mean annual increment (MAI), in cubic feet per acre, of natural, well-stocked, even aged stands of species suitable to the local site (USFS 2019). Site Class I denotes sites of high productivity, Site Class II and Site Class III denote sites of intermediate productivity potential, and Site Class IV and Site Class V denote sites of lowest productivity potential. Per CEC staff review of approved THPs within the project site (see **Table 5.17-1**), staff have determined that the project site is primarily Site Class I (high productivity) with some areas of Site Class II (intermediate productivity) (CAL FIRE 2024a, 2024b, and 2024c). As the applicable THPs do not specify the location and acreages of each site class, and/or include forest lands that are outside of the project site, staff is unable to calculate the precise acreages of Site Class I and Site Class II within the proposed project site.

2 Cal. Code Regs., tit. 14, section 1060 (Site Classification)

TABLE 5.17-1 APPROVED APPLICABLE TIMBER HARVESTING PLANS ON PORTIONS OF THE PROJECT SITE OVER THE LAST 25 YEARS

Timber Harvest Plan (THP) #	Year	THP Name	Landowner[1,2]	Silviculture[3,4]	Acreage in project site
2-99-288-SHA	1999	Splinters	Roseburg Resources	Clearcut Commercial Thin Shelterwood – Removal	2.98 260.46 42.31
2-02-209-SHA	2002	North Fork	Roseburg Resources	Clear Cut Commercial Thin	4.99 42.89
2-05-104-SHA	2005	Hatchet	Roseburg Resources	Clearcut Selection	35.44 1.54
2-05-176-SHA	2005	Cedar	Roseburg Resources	Clearcut Selection Shelterwood – Removal	34.40 19.68 0.36
2-05-187-SHA	2005	Monkey	Roseburg Resources	Clearcut	51.76
2-06-168-SHA	2006	Little	Roseburg Resources	Clearcut Selection Commercial Thinning Road Right of Way	1.92 0.00 0.00 0.00
2-08-100-SHA	2008	Boots	Oxbow Timber I, LLC	Clearcut Selection	190.00 3.88
2-10-066-SHA	2010	Snowey	Oxbow Timber I, LLC	Clearcut Commercial Thin Restoration of Understocked Selection Road Right-of-Way	20.12 12.23 9.11 0.00 0.00
2-13-082-SHA	2013	Mt Gomer	Oxbow Timber I, LLC	Clearcut Selection Road Right-of-Way	15.59 0.51 0.65
2-13-086-SHA	2013	Terry Cloth	Oxbow Timber I, LLC	Clearcut Selection Road Right-of-Way	35.49 0.00 0.15
2-16-077-SHA	2016	Cedar Boots	Oxbow Timber I, LLC	Clearcut	112.82

TABLE 5.17-1 APPROVED APPLICABLE TIMBER HARVESTING PLANS ON PORTIONS OF THE PROJECT SITE OVER THE LAST 25 YEARS

Timber Harvest Plan (THP) #	Year	THP Name	Landowner[1,2]	Silviculture[3,4]	Acreage in project site
				Selection Road Right of Way	3.26 0.00
2-17-077-SHA	2017	Littlefox	SCT LLC	Alt. Pres./Clear Cut Selection Road Right of Way	0.55 0.00 0.00
2-20-00137-SHA	2020	Forks	SCT LLC	Alt. Pres./Shelterwood-Re. Clearcut Commercial Thin Road Right-of-Way Selection	21.44 105.80 45.23 0.32 4.17
2-21-00170-SHA	2021	Green	SCT LLC	Alt. Pres./Clear cut	1.52
2-21-00173-SHA	2021	Rim	SCT LLC	Alt. Pres./Clear cut	24.84
				TOTAL	**1,103.10**

Sources: CAL FIRE 2024a, CAL FIRE 2024b, CAL FIRE 2024c

Notes:

1 - Oxbow Timber I, LLC is a subsidiary of Roseburg

2 - SCT LLC = Shasta Cascade Timberlands, LLC

3 - Alt Pres. = Alternative Prescription

4 - Shelterwood Re. = Shelterwood – Removal Step

Proposed Disturbance.[3] The total area of project-related disturbance is anticipated to be 1,058 acres within the 2,855-acre proposed project site, of which 510 acres would be permanently disturbed (i.e., conversion from timberlands to non-timber uses), and 548 acres would be temporarily disturbed during the 24 to 28-month construction period. Second growth "natural" stands occupying 318 acres in the project site average 17 MBF/acre. To prepare the site for project implementation, the anticipated volume of timber to be removed utilizing mechanized logging equipment is approximately 5,400 MBF. At approximately 4.5 MBF per load, there would be approximately 1,200 loads of logs removed from the project footprint. In addition, top and slash byproducts from harvesting logs in the second growth stands, along with materials removed from plantations, would be chipped and shipped to biomass plants to produce energy. It is anticipated that 8,900 bone dry tons (BDT) will be generated at an average of 15 BDT/load from second growth stands and 12 BDT/load from plantations, requiring approximately 720 haul loads. Burney Forest Power has been identified by the applicant as the most likely purchaser of biomass fuel from the project site (FWPA, TN 251438).

Regulatory

The proposed project site has been designated as "timberland" by Shasta County, which is defined in California Public Resources Code section 4526 as "land…which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products." For projects not under the jurisdiction of the CEC, the management of privately owned timberland is overseen by the State Board of Forestry and Fire Protection (State Board) and is subject to several regulations pertaining to forest resource management, including California Department of Forestry and Fire Protection's (CAL FIRE) Certified Regulatory Program. The following section includes a summary of the regulatory framework (i.e., laws, ordinances, regulations, and standards [LORS]) that guides management activities for designated "timberland," including timber harvesting activities and proposals for timber conversion, and the CEC's role in that process for jurisdictional facilities. A discussion of conformance with these LORS is presented in **Table 5.17-2**.

Federal

No federal LORS related to forestry resources are applicable to the proposed project.

State

Z'berg-Nejedly Forest Practice Act of 1973 (Public Resources Code sections 4511-4630.2). The Z'berg-Nejedly Forest Practice Act of 1973 establishes the authority of the State Board to regulate commercial timber operations on privately owned land. Per Public Resources Code sections 4581-4592.5, a THP must be prepared by a Registered Professional Forester for any proposed timber operations. Public Resources Code sections 4621-4628 also establish the State Board's authority to

3 The project-related disturbance and timber removal calculations summarized in this paragraph are from the Fountain Wind Project Timber Analysis (FWPA, TN 251438).

regulate timberland conversion. If an alternative to timber growth and production is proposed, such as an industrial scale wind energy facility, the Timberland Conversion Permit (TCP) process is triggered, which is subject to a specific regulatory review process that is described under the California Forest Practice Rules below.

Public Resources Code section 21080.5 allows a State agency's regulatory program to be used as a CEQA equivalent process if that program involves the discretionary review of a plan or other environmental documentation prior to the issuance of a permit or entitlement. CEQA Guidelines section 15251(a) identifies CAL FIRE's timber harvesting regulatory program as a certified program that satisfies the requirements of Public Resources Code section 21080.5. As such, CAL FIRE's timber harvesting regulatory program is exempt from the requirements of preparing an EIR for proposed timber harvesting operations. In lieu of an EIR, CAL FIRE evaluates THPs through its timber harvesting regulatory program and has established criteria in its Forest Practice Rules for the preparation, review, and approval of THPs. When it receives a proposed THP, CAL FIRE consults with responsible agencies that include California Department of Fish and Wildlife, the Regional Water Quality Control Board with jurisdiction over the watershed containing the site of the proposed timber harvest, and California Geological Survey (Cal. Code Regs., tit. 14, sections 898.1-898.2). These agencies determine whether the content of the proposed THP is sufficient and contains enough detail to allow for adequate review when making their respective decisions on their regulatory and discretionary permit processes.

Timberland Productivity Act of 1982 (Gov. Code sections 51100-51155). The Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976, which was later amended and replaced by the Timberland Productivity Act of 1982, allows counties or cities to create Timberland Production Zones (TPZs). TPZs are intended to preserve forest resources by restricting uses to growing and harvesting timber, and TPZ owners benefit from reduced property taxes pursuant to the Timber Yield Tax Law (CDTFA 2007). Each TPZ is zoned for an initial term of 10 years and is automatically reenrolled each subsequent year unless a notice of rezoning is given to the applicable jurisdiction (i.e., county board or city council) (Gov. Code section 51114). The local application of the TPZ designation to the proposed project site is discussed below under *Shasta County Municipal Code*.

California Forest Practice Rules (Cal. Code Regs., tit. 14, sections 895-1115.3). The provisions of the Z'berg-Nejedly Forest Practice Act of 1973 and the Timberland Productivity Act of 1982 are implemented by CAL FIRE through its Forest Practice Rules. The Forest Practice Rules guide the content of THPs, the application process for TCPs, and the procedures for CAL FIRE's discretionary review of THPs and TCPs.

Per the Forest Practice Rules, any proposed activity that is an alternative use (i.e., determined not to be compatible within a TPZ by the local jurisdiction) would require immediate rezoning of the TPZ to allow for the alternative use (Cal. Code Regs., tit. 14, section 1100). However, no immediate rezoning of the TPZ can occur until CAL FIRE

issues a TCP to the timberland owner (Cal. Code Regs., tit. 14, section 1104). The TCP approves the application for timberland conversion and authorizes the conversion to a non-timber use (Cal. Code Regs., tit. 14, section 1100(h)).

CAL FIRE's review of a TCP application differs from the THP review process, in that it begins after the local jurisdiction's CEQA process is complete. Prior to submitting a TCP application with CAL FIRE, an applicant must complete the CEQA review process with the CEQA Lead Agency that has authority over the project site. The CEQA document must address the proposed rezone and alternative use. Once the CEQA Lead Agency has certified the environmental document, approved the project, and tentatively approved the TPZ rezone, the applicant will submit a TCP application to CAL FIRE. Final approval of the TPZ rezone is subject to a discretionary review and approval by the Director of CAL FIRE pursuant to Public Resources Code section 4621.2. Rezoning of the TPZ cannot occur until the TCP has been approved and issued by CAL FIRE.

The following regulations from the Forest Practice Rules guide CAL FIRE's discretionary review of THPs and TCPs:

- Per Cal. Code Regs., tit. 14, section 1102, the Director of CAL FIRE is responsible for approval or denial of a proposed THP or an application for a TCP, respectively.
- Per Cal. Code Regs., tit. 14, section 1100(g)(2) and section 1100(j), "timberland conversion" is defined as the immediate rezoning of TPZ lands, whether timber removal operations are involved or not. "Immediate rezoning" is defined as a change in zoning for land use by the appropriate county or city having jurisdiction over an area within a TPZ. The rezoning would allow an alternative use.
- Per Cal. Code Regs., tit. 14, section 1103, any person, firm, corporation, company, partnership or government agency owning timberland for which the timberland owner proposes conversion shall apply to the Director of CAL FIRE on a form prescribed by him for issuance of a TCP.
- Per Cal. Code Regs., tit. 14, section 1103.1(b), no activities shall be conducted on timberland for which a TCP has been issued until a THP has been filed with and found in conformance by the Director of CAL FIRE.
- Per Cal. Code Regs., tit. 14, section 1106, in order to issue a TCP, the Director of CAL FIRE must make the following five findings regarding the proposed timber conversion:
    - The applicant has established a bona fide intent to carry out the conversion (i.e., a present sincere intention to conform with and successfully execute the conversion plan);
    - The Director makes written findings pursuant to Public Resources Code section 4621.2 regarding the conversion being in the public interest, and the site's suitability for the alternative use;
    - The Director makes written findings pursuant to Public Resources Code section 21081 regarding the EIR prepared for the timber conversion. These findings

document the CEQA lead agency's conclusion that specific overriding economic, legal, social, technological, or other benefits of the conversion outweigh any significant and unmitigable effects on the environment;

- The Director finds that necessary and feasible mitigation measures have been incorporated into the proposed conversion; and
- If located within a TPZ, the Director must find that other proximate and suitable land outside of a TPZ are unavailable.

State Board of Forestry and Fire Protection General Board Policies. The State Board enacts policy statements to provide further direction to itself or to CAL FIRE on forest management issues. State Board Policy section 0334 (Maintenance of Timber Supply) emphasizes the State Board's goal to maintain timber growing land in California as a permanent source of timber. According to State Board Policy 0334.3(a), it is in the public interest to oppose conversion of a TPZ unless the public values to be achieved by the conversion exceed the public values from timber growing (CA BOF 2024b).

Under Public Resources Code section 25545.1, if the CEC were to approve the proposed project, the TCP would not be issued by CAL FIRE but incorporated into the CEC's certification authorizing the construction and operation of the project. The environmental analysis supporting that issuance of the TCP normally found in the THP would be contained in the CEC's staff assessment.

Local

Central Valley Regional Water Quality Control Board (CVRWQCB) Order R5-2017-0061. Anyone working on behalf of the timberland/timber owner in the conduct of timberland management activities shall apply for and obtain a Category 5B Timber Waiver from the CVRWQCB (CVRWQCB 2017). The CVRWQCB requires the following:

- Notice of Intent (NOI) 15 days prior to operations;
- Annual notice of operations 15 days prior to start-up;
- Annual National Core BMP monitoring protocols or Implementation, Forensic, and Effectiveness Monitoring; and
- Summary of Operations.

Shasta County Municipal Code. The project site is zoned by Shasta County as Timber Production (TP). Shasta County Municipal Code section 17.08.010 states that the purpose of a TP district is to preserve lands for timber growth and harvesting in compliance with the California Timberland Productivity Act of 1982, and to ensure compatibility with uses associated with timber production. Shasta County's TP district is the zoning equivalent of a TPZ as defined in the California Timberland Productivity Act of 1982. Municipal Code section 17.08.010 also reiterates that lands within a TP district are subject to all of the conditions and restrictions applicable to a TPZ.

Cumulative

The Forestry Resources analysis considers potential impacts to timberland at the project site and within the properties surrounding the project that contain timberland. As the study area for Forestry Resources is defined broadly to encompass any potential timberland impacts from construction and operation of the proposed project, this same geographic extent would be suitable for the cumulative analysis.

5.17.2 Environmental Impacts

FORESTRY RESOURCES	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
a. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code, section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code, section 51104(g))?	☒	☐	☐	☐
b. Would the project result in the loss of forest land or conversion of forest land to non-forest use?	☒	☐	☐	☐
c. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use?	☐	☒	☐	☐

Environmental checklist established by Cal. Code Regs., tit. 14, Div. 6, Ch. 3, Appendix G, land use and planning and agriculture and forestry resources.

5.17.2.1 Methodology and Thresholds of Significance

In addition to the above environmental checklist, staff used the following methodology and thresholds of significance to evaluate the project. Significance criteria used in this

document are based on Appendix G of the CEQA Guidelines and performance standards or thresholds identified by CEC staff, as well as applicable LORS utilized by other governmental regulatory agencies. An impact may be considered significant if the proposed project results in:

- Conversion of timberland
  - Permanent and temporary conversion of timberland zoned timberland production, to non-timber use.
  - Conflict with existing zoning for timber use.
  - Involve other changes in the existing environment which, due to their location or nature, could result in conversion of timberland, to non-timber uses.
- Individual environmental effects, which, when considered with other impacts from the same project or in conjunction with impacts from other closely related past, present, and reasonably foreseeable future projects, are considerable, or would compound, or increase other environmental impacts.

5.17.2.2 Direct and Indirect Impacts

a. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code, section 12220(g)), timberland (as defined by Public Resources Code, section 4526), or timberland zoned Timberland Production (as defined by Government Code, section 51104(g))?

Significant and Unavoidable Impact. The proposed project site is zoned TP district by the County of Shasta (Municipal Code Chapter 17.08 – Timber Production District). The purpose of the TP district is to preserve lands devoted to, and used for, the growing and harvesting of timber that meet the requirements of the California Timberland Productivity Act of 1982 (Gov. Code sections 51100-51155). The TP district also allows uses that are compatible with the growing and harvesting of timber. This zoning district is equivalent to the TPZ designation referred to in the California Timberland Productivity Act, and land within a Shasta County TP district is subject to all conditions and restrictions applicable to a TPZ. A discussion of the project's conformance with adopted Forestry LORS is presented in **Table 5.17-2**. See **Section 5.8, Land Use and Agriculture**, for a full discussion of project consistency with the County's Municipal Code.

Per California Code of Regulations, title 14, section 1100(j), immediate rezoning of a Timberland Production Zone (i.e., TP district or TPZ) is a requirement to allow for an alternative use that is not compatible with timber operations. CAL FIRE's Forest Practice Rules define immediate rezoning within a Timberland Production Zone as a form of timberland conversion (Cal. Code Regs., tit. 14, section 1100(g)(2)).

In 2021, Shasta County determined that the proposed project, as a large wind energy system, would not be compatible with timber operations within a TP district (COS

2021). The Shasta County Board of Supervisors issued Ordinance No. SCC 2022-04 to further clarify the types of industrial developments such as “gas, electrical, water or communication facility, or other public improvements” that would be conditionally permitted in a TP district. Shasta County Ordinance No. SCC 2022-04 amended Municipal Code sections 17.88.035, 17.88.100, and 17.88.335 to define small wind energy systems as a compatible use in most zoning districts including the TP zone, and to define large wind energy systems as a prohibited use in all zoning districts of unincorporated Shasta County (FWPA, TN 248330-5).

Per Shasta County Municipal Code section 17.88.335, no permit or approval of any type may be issued for a large wind energy system in a TP district. If the project were to be approved, the proposed project site would require an immediate rezoning (as discussed in Section 5.17.1.2) of a Timberland Production Zone (TP district or TPZ) per California Code of Regulations, title 14, sections 1109.1 and 1109.2, which is considered a form of timberland conversion.

The proposed project currently conflicts with the County’s prohibition on utility-scale wind energy facilities in a TP district. Furthermore, the proposed project would require the rezoning of timberland zoned Timberland Production (i.e., TP district or TPZ). Therefore, construction and operation of the proposed project would create a significant and unavoidable impact associated with LORS non-compliance.

In order for the CEC to approve the project with a zoning and land use inconsistency, the CEC must make certain findings as set forth in Public Resources Code section 25525. See **Section 11, Override Findings and Recommendations** for a detailed discussion on both LORS and CEQA overriding considerations.

b. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

Construction and Operation

Significant and Unavoidable Impact. One of Shasta County's most valuable resources is its timberland, which is a type of “forest land” as defined in Public Resources Code section 12220(g). Of the County's 2,428,000 total acres, 50.7 percent or 1,231,000 acres are dedicated to commercial forest uses. In 2002, 613,495 acres of privately owned timberlands were designated in TPZs pursuant to California's Forest Taxation Reform Act of 1976. These TPZs represent nearly half of all Shasta County timberlands and approximately 87 percent of privately owned timberlands (COS 2004). In 2016, Shasta County provided the largest share of California’s timber harvest compared to all other counties in the State (Marcille, Morgan, Mclever, and Christensen 2020).

The proposed project would result in the permanent conversion of 510 acres of forest land within a designated TPZ to a non-forest use. In order for staff to analyze the environmental impacts of such removal and incorporate the required findings typically performed by CAL FIRE in order to issue a TCP, staff requested additional information

from the applicant detailing quantity of timber anticipated to be removed, the process for removing the timber, where the timber will be shipped and processed, and site treatment activities following timber removal. The applicant submitted a timber analysis memorandum dated July 31, 2023 (TN 251438), which detailed this information.

The purpose of a TPZ is to preserve the land that is best suited for the growing and harvesting of timber from being converted to non-timber uses. Lands zoned as TPZ are subject to the provisions of the California Timberland Productivity Act of 1982 (Gov. Code section 51000 et seq.) and represent the best timberland in a county. As discussed in subsection 5.17.1.2, the State Board issued Policy 0334.3 reiterating the goal of maintaining timberland as a permanent source of timber. Furthermore, Policy 0334.3 emphasizes that it is in the public interest to oppose conversion of TPZs to uses that preclude timber growing.

The University of California Division of Agriculture and Natural Resources (UC ANR)[4] has reported that the greatest threat to California forests is not loss of forest due to harvesting and the lack of subsequent regrowth, but from conversion to non-forests from serious catastrophic events such as large wildfires and land use conversion (UC ANR 2024). Timberlands are being converted to non-timberlands at a rapid pace due to climate change and mega-fires driven by climate change. Nearly 200 million trees, stressed by drought, have died in recent years from bark beetle infestation linked to warmer winters. Hotter summers and strong dry winds are resulting in catastrophic megafires. In addition to the destruction, these megafires are converting hundreds of thousands of acres of conifer forests to shrub land and emitting black carbon, further compounding the climate change crisis (UC ANR 2024).

Based on a 2023 study that was funded by CAL FIRE and the U.S. Forest Service, which analyzed fires across the North Coast, Cascade Mountains, and Sierra Nevada Mountains from 2018-2021, the entire Fountain Wind project area will experience fire over the next 20 years (Mason, Bruce and Girard 2023). The 2023 study found that 36% of the anticipated burn area is likely to be affected by high severity fire, where overstory tree mortality typically exceeds 75%. The study evaluated the effects of high severity fire patches, which are often over 40 acres in size and located greater than 100 meters from a potential natural seed source. Due to the distance from potential natural seed sources, these high severity fire patches experience a delay in forest regeneration and are at risk of conversion to non-forest vegetation (Mason, Bruce and Girard 2023).

At the same time that California's forests are at risk from large wildfires, these forests are also feeling the impacts of population growth. Urbanization, development and parcelization in rural areas are changing land use away from forests. A study entitled *Timberland Conversions in California from 1969 to 1998* (completed by a Forest Economist for CAL FIRE) found that during the 30-year period studied, approximately 112,866 acres were converted to non-timberland (Shih 2002). The northern region of

4 The University of California Division of Agriculture and Natural Resources (UC ANR) is the Cooperative Extension arm of the UC System.

California, which includes Shasta County, accounted for 49% of these timberland conversions (i.e., 55,021 acres). The U.S. Forest Service predicts a similar trend over the next 50 years with the loss of 1.9 – 3.7% of timberland to developed land uses (USFS 2023). The study further predicts an accelerated timberland conversion rate due to the State's large population, economic growth, and public policies on land use (Shih 2002).

As stated above, construction and operation of the proposed project would result in the permanent conversion of 510 acres of Class I (high productivity) and II (intermediate productivity) forest land to non-forest use. Staff consulted with Registered Professional Foresters regarding the severity of this proposed conversion (Pacific Forest Trust 2024). Representatives from Pacific Forest Trust have stated that in their professional judgement, the conversion of 510 acres of Class I and II timberland is a significant impact. This judgement is based on observations of the ongoing rate of conversion of timberland in California, and the quality of the proposed project site as Site Class I within a TPZ.

To develop mitigation, staff consulted with the co-founder and Senior Strategic Advisor of the Pacific Forest Trust, Constance Best, who noted that timberland preserves are not typically used as mitigation for timberland conversion in California. Timberland preserves are more often used to address loss of threatened and/or endangered species habitat (Pacific Forest Trust 2024). However, given the quality of the forest land within the proposed project site, experts from Pacific Forest Trust recommend a one-to-one mitigation requirement for conversion of lands zoned TPZ that are classified Site Class I and II. The content of **FOREST-1** is similar to requirements typically applied to the conversion of prime agricultural lands and biologically sensitive wetlands.

Conversion of 510 acres of Site Class I and II timberland that is zoned as a TPZ represents a significant and unavoidable impact to forest resources in California. While the impact cannot be avoided or reduced to a less-than-significant level if the project is approved, staff recommends implementation of **FOREST-1** to help with protection of timber resources. This measure requires the project owner to provide a fee payment to a land trust for the preservation of 510 acres of Site Class I and II timberland at a one-to-one ratio of equivalent site classification.

c. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use?

Construction

Less Than Significant with Mitigation Incorporated. There are 548 acres of forest land that would be disturbed by temporary construction activities, which would include laydown areas, concrete batch plants, and construction corridor buffer areas along access roads, underground collector lines, and overhead collector lines. Once the 24 to 28-month construction period is complete, these areas of temporary disturbance would

be revegetated. If revegetation activities do not follow prescriptions that are specific to forest regeneration, areas of temporary disturbance may be converted to brush (*Arctostaphylos sp*. and *Ceanothus sp*.). A conversion of forest land to brush vegetation during revegetation activities would result in a significant impact. However, careful management of revegetation activities, as described in **FOREST-2**, would ensure that forest regeneration is successful within the 548 acres of temporary disturbance. **FOREST-2** specifies steps for restoration of timber resources on temporarily impacted forest lands, such as through herbicide treatments to control competing vegetation, planting of conifer seedlings, and periodic maintenance of the seedling plantations. Impacts to forest resources within temporary disturbance areas would be less than significant with implementation of **FOREST-2**.

Operation

No Impact. During the proposed project's operational phase, temporary disturbance areas would be revegetated and managed to restore timber resources. These revegetated areas would not be disturbed during project operations. Operation of the project would occur entirely within areas of permanent disturbance analyzed under part (b), and there would be no new areas of disturbance affecting forest land. Activities specific to project operation would not convert forest land to non-forest use. No new impact would occur.

5.17.2.3 Cumulative Impacts

A cumulative impact to forestry resources would occur if:

- The total affected acreage or conversion of timberland from the proposed project in combination with other projects would be cumulatively considerable.

Significant and Unavoidable Impact. "Natural" conversion of timberlands to shrubs and grasses over the last 40 years has taken place due to climate change and the increase in wildfire. Studies using time series remote sensing and geospatial data estimate a 6.7% decline in tree cover area in California since 1985 (Wang et al. 2022). There are higher levels of tree cover loss in warmer and drier areas indicating that climate change threatens California's forests (Wang et al. 2022). A large portion of timber resources impacted by the Fountain Fire (1992) have been reforested, but a portion has transitioned to brush.

As discussed in subsection 5.17.2.2 part (b), the proposed project would result in a permanent conversion of 510 acres of Site Class I and II timberland to a non-timberland use. Given that Shasta County is located in an area of California with the greatest rate of timberland conversion (i.e., 49% of conversions were found to occur in northern California), this permanent conversion would result in a cumulatively considerable impact associated with timberland conversion in the State. The proposed project's contribution to the overall cumulative effect on forest resources is considered significant and unavoidable.

5.17.3 Project Conformance with Applicable LORS

Table 5.17-2 contains staff's determination of conformance with applicable LORS. As shown in this table, staff concludes that the proposed project would not be consistent with several applicable LORS.

TABLE 5.17-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
State	
Z'berg-Nejedly Forest Practice Act of 1973 (Public Resources Code sections 4511-4630.2)	
Public Resources Code section 4621: A person who owns timberlands that are to be devoted to uses other than the growing of timber shall file a Timberland Conversion Permit (TCP) with the State Board of Forestry and Fire Protection. The State Board shall, by regulation, prescribe the procedures for, and the form and content of, the application.	**No.** In April 2021, the applicant submitted a TCP application to CAL FIRE that was based on the 2020 Fountain Wind Project Draft EIR (FWPA, TN 248312). The applicant's TCP application stated that a zoning change through the county would not be necessary because the project was compatible with a TP district per Municipal Code section 17.08.030 (D), and that a THP would be prepared and submitted following completion of the Final EIR (FWPA, TN 248312). However, in the months following the TCP application submittal, Shasta County denied the applicant's permit application for the Fountain Wind Project and amended its land use laws which confirm a large wind farm is not a compatible use with a TP district. Therefore, the project is not consistent with the current designation for timber production.
Timberland Productivity Act of 1982 (Cal. Gov't Code sections 51100-51155)	
Allows counties or cities to create Timberland Production Zones (TPZs). TPZs are intended to preserve forest resources by restricting uses to growing and harvesting timber, and TPZ owners benefit from reduced property taxes pursuant to the Timber Yield Tax Law (CDTFA 2007).	**No**. The project is currently inconsistent with the timber production zoning and is not considered a use compatible with forestry operations.
State Board of Forestry and Fire Protection General Board Policies	
Policy 0334.3. In order to maintain timber growing land in California as a permanent source of current and future timber supply, the Board has found that it is in the public interest: To oppose conversion to uses which preclude timber growing and harvesting on such privately owned timberlands and other lands which have been classified as TPZ under provisions of the Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976, except where the public values to be achieved by such conversion exceed the public values derivable from timber growing. This policy applies both to conversion proposed by the owner of the land and to proposals for	**No**. The proposed project would not be compatible with a designated TPZ and would require conversion of the TPZ to a non-timber use. TPZ conversion is opposed by the State Board unless the conversion is in the public interest. However, Shasta County, in its denial of the project in 2021, and in its opposition filing on August 11, determined that the project "would be detrimental and injurious to the general welfare of people in the County and to County property" and consequently would have less value to the public than current operations within the TPZ (COS 2023). As such, conversion of the TPZ to allow for an incompatible use (i.e., large wind energy system) would not be consistent with General Board Policy 0334.3.

TABLE 5.17-2 CONFORMANCE WITH APPLICABLE LORS

Applicable LORS	Conformance and Basis for Determination
public acquisition of such land that do not include a managed timberland component.	
Local	
Timber Waiver – Waste Discharge Central Valley Regional Water Quality Control Board	
Order R5-2017-0061: Waste Discharge Requirements for Discharges Related to Timberland Management Activities for Non-Federal and Federal Lands. Per Central Valley Regional Water Quality Control Board (CVRWQCB) Order R5-2017-0061, anyone working on behalf of the timberland/timber owner in the conduct of timberland management activities shall apply for and obtain a Category 5B Timber Waiver from the CVRWQCB, which requires a Notice of Intent (NOI) 15 days prior to operations, annual notice of operations 15 days prior to start-up, and annual National Core BMP monitoring protocols or Implementation, Forensic, and Effectiveness Monitoring and Summary of Operations (CVWQCB 2017)	**Yes**. If the project is approved, a Category 5B Timber Waiver would need to be applied for and obtained from the CVRWQCB. Issuance of this timber waiver would ensure the project is consistent with this LORS. Under Public Resources Code section 25545.5(d)(2) the CVRWQCB has 90 days from the CEC's certification of the project to take final action and issue any permits or waste discharge requirements.
Shasta County Municipal Code, Title 17 – Zoning	
Chapter 17.08 – Timber Production (TP) District 17.08.010 - Purpose. To preserve lands for timber growth and harvesting in compliance with the California Timberland Productivity Act of 1982, and to ensure compatibility with uses associated with timber production.	**No**. The proposed project would be defined as a "large wind energy system" as it is a utility-scale wind energy facility that would connect to the electric grid. Shasta County Ordinance No. SCC 2022-04 amended the Municipal Code to prohibit large wind energy systems in all zoning districts of unincorporated Shasta County. The project would not be a compatible use within a TP district.

5.17.4 Conclusions and Recommendations

The proposed project would not conform with Shasta County Municipal Code section 17.88.335 which prohibits a large wind energy system within a TP district. There is no feasible mitigation that would bring the proposed project into conformance with a TP district. Absent an immediate rezoning by the county to support a TCP, approval of the project would require the CEC to override the zoning inconsistency under Public Resources Code section 25525 to allow development of non-timber uses, which is a form of timberland conversion.

The proposed project would result in the permanent conversion of 510 acres of forest resources that are classified as Site Class I (high productivity) and II (intermediate productivity). This conversion represents a significant and unavoidable impact. Although this impact is unavoidable and cannot be reduced to a less-than-significant level, staff recommends Condition of Certification **FOREST-1** to ensure that timberland is preserved within Shasta County. **FOREST-1** requires the project owner to address the

permanent conversion of 510 acres of Site Class I and II timberland to non-timber use at a one-to-one ratio.

The proposed project would revegetate 548 acres of forest land that would be disturbed by temporary construction activities. If revegetation activities do not follow prescriptions that are specific to forest regeneration, areas of temporary disturbance may be converted to brush, resulting in a significant impact from conversion of forest land to brush vegetation. Staff recommends Condition of Certification **FOREST-2**, which prescribes treatments to ensure that forest regeneration is successful. Impacts to forest resources within temporary disturbance areas would be less than significant with implementation of **FOREST-2**.

5.17.5 Proposed Conditions of Certification

FOREST-1 The project owner shall provide a fee payment to a land trust for the permanent conversion of 510 acres of Site Class I and II timberland at a one-to-one ratio of equivalent site classification.

Verification: The project owner shall provide a mitigation fee payment to a land trust with a record of handling timber resources and the establishment of timber preserves. The mitigation fee payment must be approved by the Compliance Project Manager (CPM) at least 120 days prior to the start of construction.

The fee payment will be determined by an independent appraisal conducted on available, comparable, timberland property on behalf of the land trust. The project owner shall pay all costs associated with the appraisal. The project owner shall provide documentation to the CPM that the fee has been paid and that the 510 acres of timberland and/or easements shall be purchased within three years of start of operation as compensation for the 510 acres of timberland to be converted by the project.

The documentation also shall guarantee that the land/easements purchased by the trust will be located in Shasta County and will be managed for timber resources in perpetuity. If no available land or easements can be purchased in Shasta County, then the purchase of lands/easements in other areas within other adjacent northern California region counties, such as Tehama County or Siskiyou County, is acceptable. The project owner shall provide to the CPM updates in the Annual Compliance Report on the status of timberland/easement purchase(s).

FOREST-2 The project owner shall reforest the 548 acres of temporarily converted timberlands, including site preparation (i.e., herbicide treatments to control competing vegetation) and planting of conifer seedlings. Reforestation activities will include: (1) application of a pre-emergent herbicide to reduce competition from shrubs and grasses on planted conifer seedlings; and (2) planting of conifer seedlings representing Sierran mixed conifer species (Ponderosa pine, sugar

pine, white fir, Douglas fire, and incense cedar) at a density described and approved within the project-specific Timber Harvesting Plan.

Verification: A third-party Registered Professional Forester (i.e., licensed as a professional forester pursuant to Public Resources Code section 752) will provide the Compliance Project Manager (CPM) with documentation of forest inventory plots determining conifer seedling success at the 1 and 5 year points. This documentation shall demonstrate that reforestation efforts are meeting California Forest Practice Rule minimum acceptable standards for stocking of an area with commercial tree species (Cal. Code Regs., tit. 14, sections 912.7, 932.7, 952.7). Additional herbicide and planting will be required by the Registered Professional Forester as necessary to meet stocking standards.

5.17.6 References

CA BOF 2024a – California Board of Forestry. California Forest Practice Rules 2024. Accessed April 16, 2024. Accessed online at: https://bof.fire.ca.gov/media/qs5p1yk4/2024-forest-practice-rules-and-act-final.pdf

CA BOF 2024b – California Board of Forestry. California Board of Forestry, General Board Policies. Accessed April 17, 2024. Accessed online at: https://bof.fire.ca.gov/about/board-policies/

CAL FIRE 2024a – California Department of Forestry and Fire Protection. Forest Practice GIS. Accessed April 18, 2024. Accessed online at: https://www.fire.ca.gov/what-we-do/natural-resource-management/forest-practice/forest-practice-gis

CAL FIRE 2024b – California Department of Forestry and Fire Protection. CalTREES: Timber Regulation and Forest Restoration. Accessed April 17-18, 2024. Accessed online at: https://caltreesplans.resources.ca.gov/caltrees/

CAL FIRE 2024c – California Department of Forestry and Fire Protection. California Watershed Mapper. Accessed April 16-18, 2024. Accessed online at: https://egis.fire.ca.gov/Watershed_Mapper/

CDTFA 2007 – California Department of Tax and Fee Administration. Timber and Timberland Values Manual, dated July 2007. Reprinted February 2019. Accessed online at: https://www.cdtfa.ca.gov/taxes-and-fees/timbermanualfinal.pdf

COS 2004 – County of Shasta. Shasta County General Plan. Section 6.2: Timberlands. Amended through September 2004. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan

COS 2023 – County of Shasta (TN 251601). Shasta County Opposition to AB 205 Jurisdiction and Objection to Notice of Completion Request, dated August 14, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2021 – County of Shasta (TN 254275). Audio Transcription of Shasta County Board of Supervisors Meeting, dated October 26, 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CVRWQCB 2017 – Central Valley Regional Water Quality Control Board. 2017. Order #R5-2017-0061 - Waste Discharge Requirements General Order For Discharges Related to Timberland Management Activities for Non-Federal and Federal Lands. Accessed April 16, 2024. Accessed online at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2017-0061_w_att_a.pdf

FWPA – Fountain Wind Project Application (TN 248312). Fountain Wind Project Timberland Conversion Permit Application and Plan, dated April 23, 2021. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248330-5). Ordinance No. SCC 2022-04. An Ordinance of the Board of Supervisors of the County of Shasta Regulating Small and Large Wind Energy Systems, dated July 12, 2022. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251438). LU-001 Fountain Wind Timber Analysis, dated August 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Marcille, Morgan, Mclever, and Christensen 2020 – Marcille, Kate C., Morgan, Todd A., McIver, Chelsea P., and Christensen, Glenn A. California's Forest Products Industry and Timber Harvest, 2016. Forest Industry Fact Sheet No. 3. U.S Forest Service, Pacific Northwest Research Station. Dated December 2020. Accessed online at: https://www.bber.umt.edu/pubs/forest/fidacs/CA2016.pdf

Mason, Bruce and Girard 2023 – Mason, Bruce and Girard Natural Resource Consultants. Long-Term Economic Impacts of Large Fires in California from 2018-2021: Losses and Opportunities. Funded by CAL FIRE and U.S. Forest Service. Accessed October 2, 2024. Accessed online at: https://bof.fire.ca.gov/media/mkhn2dyd/fire_impacts_report-final-_adamfk.pdf

Pacific Forest Trust 2024 – Personal communication with Constance Best, Co-founder and Senior Strategic Advisor of the Pacific Forest Trust. October 1, 2024

Shih 2002 – Tian-Ting Shih, Forest Economist. Timberland Conversion in California from 1969 to 1998. California Department of Forestry and Fire Protection. Fire and Resource Assessment Program. Technical Working Paper 1-01-02

UC ANR 2024 – University of California Division of Agriculture and Natural Resources. Forest Research and Outreach: California Forests. Accessed October 2, 2024. Accessed online at: https://ucanr.edu/sites/forestry/Ecology/

USFS 2023 – U.S. Department of Agriculture Forest Service. Future of America's Forest and Rangelands: Forest Service 2020 Resources Planning Act Assessment. Gen.

Tech. Rep. WO-102. Washington, DC. 348 p. Dated July 2023. Accessed online at: https://doi.org/10.2737/WO-GTR-102

USFS 2019 – U.S. Department of Agriculture Forest Service, Southern Research Station. Site Class and Site Index: Two estimates of Site Quality for the Southern Research Station Forest Inventory and Analysis Program. Accessed April 16, 2024. Accessed online at: https://www.srs.fs.usda.gov/pubs/rn/rn_srs025.pdf

Wang et al. 2022 – Wang, J.A., J.T. Randerson, M.L. Goulden, C.A. Knight, and J.J. Battles. 2022. Losses of Tree Cover in California Driven by Increasing Fire Disturbance and Climate Stress. Accessed April 16, 2024. Accessed online at: https://doi.org/10.1029/2021AV000654

Section 6

Environmental Justice

6 Environmental Justice

6.1 Environmental Setting and Regulatory Background

Issued in 1994, President Clinton's Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of their mission (U.S. EPA 2023). The order requires all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address environmental justice. Federal agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. Issued in April 2023, EO 14096, "Revitalizing Our Nation's Commitment to Environmental Justice for All," amends Executive Order 12898 to better protect overburdened communities from pollution and environmental harm by directing agencies to identify, analyze, and address federal activities including disproportionate and adverse human health and environmental effects; historic inequalities, systemic barriers, or actions that impair achievement of health; and barriers that impair communities to receive equitable access to human health or environmental benefits. Additionally, EO 14096 provides opportunities for engagement with communities by directing agencies to actively facilitate meaningful public participation and just treatment of all people in agency decision-making (White House 2023).

California law defines environmental justice as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Gov. Code, § 65040.12). In keeping with its commitment to environmental sustainability and access to all, California was one of the first states to codify the concept of environmental justice in its statutes. Beyond the fair treatment principles described in statute, CEC considers environmental justice during its staff assessment process. CEC has included environmental justice analyses in its environmental review of power plant siting cases for over two decades. CEC's goal is to ensure, through equal access to the decision-making process, everyone has equal protection from environmental and health hazards and can live, learn, play, and work in a healthy environment.

Environmental Justice in the Energy Commission Siting Process

As described above, environmental justice (EJ) analysis is part of the CEC's site certification process. CEC uses the California Environmental Protection Agency's (CalEPA) California Communities Environmental Health Screening Tool (CalEnviroScreen) in addition to U.S. Census data to identify minority and/or low-income populations (i.e., an EJ population), also referred to as a disadvantaged community by CalEnviroScreen. The "Environmental Justice Project Screening" subsection below presents the demographic data for those people living in a 6-mile

radius of the proposed project site and a determination of presence or absence of an EJ population. When an EJ population is identified, the analyses in nine technical areas[1] and Mandatory Findings of Significance consider the project's impacts on this population and if those nuisance impacts would disproportionately affect the EJ population. The "Project Outreach" subsection below discusses the CEC's outreach program specifically as it relates to the proposed project.

CEC Staff typically conduct EJ analysis by taking the following steps:

- Identification of a population of minority persons and/or persons with low income (i.e., disadvantaged community), living in an area potentially affected by the proposed project;
- Providing notice in appropriate languages (when possible) of the proposed project and opportunities for participation in public workshops for disadvantaged communities;
- Identification of areas potentially affected by various project-related emissions (e.g., air quality, GHG, hazardous materials, etc.) or other project-related nuisance effects (e.g., noise, traffic, etc.); and
- A determination of the potential for a significant adverse disproportionate impact on an identified EJ population resulting from the proposed project alone, or in combination with other existing and/or planned projects in the area (i.e., from cumulative impacts).

CalEnviroScreen

Staff utilize CalEnviroScreen to identify disadvantaged communities to better understand the demographic characteristics of areas where a project impact would occur. The use of CalEnviroScreen data outputs ensures that disadvantaged communities in the vicinity of the proposed project have not been missed when screened by race/ethnicity and low income.

In 2012, CalEPA developed CalEnviroScreen as a science-based mapping tool that provides an objective method for evaluating multiple pollutants and stressors in local communities, and ultimately for identifying disadvantaged communities pursuant to Health and Safety Code section 39711 as enacted by Senate Bill (SB) 535 (De León, Stats. 2012 Ch. 830). CalEPA released an updated designation for disadvantaged communities[2] in May 2022 for the purposes of SB 535. As required by State law,

1 The nine technical areas are Air Quality; Cultural and Tribal Cultural Resources; Hazards, Hazardous Materials and Wildfire; Water Resources; Noise and Vibration; Public Health; Solid Waste Management; Transportation; and Visual Resources. Cultural and Tribal Cultural Resources considers impacts to Native American populations.

2 The California Environmental Protection Agency, for purposes of its Cap-and-Trade Program, defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts

disadvantaged communities are identified based on geographic, socioeconomic, public health, and environmental hazard criteria. CalEnviroScreen identifies impacted communities by taking into consideration pollution exposure and its effects, as well as health and socioeconomic status, at the Census-tract level (OEHHA 2021, pg. 8).

The CalEnviroScreen model incorporates 21 indicators that measure a community's exposure, environmental effects, sensitive population, and socioeconomic factors. Indicators for exposure and environmental effects comprise a Pollution Burden group, and indicators for sensitive populations and socioeconomic factors comprise a Population Characteristics group.

Table 6-1 lists the indicators that go into the Pollution Burden score and the Population Characteristics score to form the final CalEnviroScreen score. These indicators are used to measure factors that affect the potential for pollution impacts in communities.

TABLE 6-1 COMPONENTS THAT FORM THE CALENVIROSCREEN 4.0 SCORE

Pollution Burden	
Exposure Indicators	**Environmental Effects Indicators**
Children's lead risk from housing	Cleanup sites
Diesel particulate matter (PM) emissions	Groundwater threats
Drinking water contaminants	Hazardous waste
Ozone concentrations	Impaired water bodies
PM 2.5 concentrations	Solid waste sites and facilities
Pesticide use	
Toxic releases from facilities	
Traffic density	
Population Characteristics	
Sensitive Populations Indicators	**Socioeconomic Factors Indicators**
Asthma emergency department visits	Educational attainment
Cardiovascular disease (emergency department visits for heart attacks)	Housing burdened low-income households
Low birth-weight infants	Linguistic isolation
	Poverty
	Unemployment

Notes: PM= particulate matter. PM 2.5= fine particulate matter 2.5 microns or less.
Source: OEHHA 2021

The CalEnviroScreen model uses U.S. Census tract data as a geographic scale for identifying disadvantaged communities within California. For each Census tract, CalEnviroScreen calculates an overall score by combining the individual indicator scores within each of the two groups (i.e., Pollution Burden and Population Characteristics), then multiplying the Pollution Burden and Population Characteristics scores to produce a final score:

lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) Census tracts identified in the 2017 DAC (disadvantaged community) designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes (CalEPA 2022).

[Pollution Burden] x [Population Characteristics] = CalEnviroScreen Score

- Pollution Burden Score. Pollution Burden scores for each U.S. Census tract are derived from the average percentiles of the eight exposures indicators (ozone and PM2.5 concentrations, diesel PM emissions, drinking water contaminants, children's lead risk from housing, pesticide use, toxic releases from facilities, and traffic impacts) and the five environmental effects indicators (cleanup sites, impaired water bodies, groundwater threats, hazardous waste facilities and generators, and solid waste sites and facilities). Indicators from the environmental effects component are given half the weight of the indicators from the exposures component. The calculated average Pollution Burden score (average of the indicators) is divided by 10 and rounded to one decimal place for a Pollution Burden score ranging from 0.1 to 10.
- Population Characteristics Score. Population Characteristics scores for each U.S. Census tract are derived from the average percentiles for the three sensitive populations indicators (cardiovascular disease, low birth weight infants, and asthma) and the five socioeconomic factors indicators (educational attainment, linguistic isolation, housing burden, unemployment, and poverty). The calculated average percentile is divided by 10 for a Population Characteristic score ranging from 0.1 to 10.

Since each of the two groups (i.e., Pollution Burden and Populations Characteristics) has a maximum score of 10, the maximum CalEnviroScreen Score is 100. Based on these scores, Census tracts across California are ranked relative to one another. The indicator values for the Census tracts for the entire state are ordered from highest to lowest. A percentile is calculated from the ordered values for all areas that have a score. A higher percentile indicates a higher potential relative burden. A percentile does not describe the magnitude of the difference between two tracts, but rather it simply tells the percentage of tracts with lower values for that indicator (OEHHA 2021, pg. 20). Census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0 are considered disadvantaged (CalEPA 2022).

CEC staff assess project effects on low-income and/or high-minority populations by reviewing CalEnviroScreen indicators (see Table 6-1) as they relate to specific technical issues being analyzed. The project-specific Census tracts identified by CalEnviroScreen as disadvantaged are reviewed by CEC technical analysts (Air Quality; Cultural and Tribal Cultural Resources; Hazards, Hazardous Materials and Wildfire; Water Resources; Forestry Resources; Noise and Vibration; Public Health; Solid Waste Management; Transportation; and Visual Resources) to determine if any disproportionate burdens would be borne by EJ populations.

Project Outreach

In 2016, SB 1000 (Leyva, Chapter 587, Statutes of 2016) was enacted to require local governments with disadvantaged communities, as defined in statute, to incorporate environmental justice into their general plans when two or more general plan elements

(sections) are updated. The Governor's Office of Land Use and Climate Innovation (the state's comprehensive planning agency) worked with State agencies, local governments, and many partners to update the General Plan Guidelines in 2020 to include guidance for communities on environmental justice (LCI 2020). This law has several purposes, including to facilitate transparency and public engagement in local governments' planning and decision-making processes, reduce harmful pollutants and the associated health risks in environmental justice communities, and promote equitable access to health-inducing benefits, such as healthy food options, housing, public facilities, and recreation.

Meaningful involvement is an important part of the siting process and occurs when:

- Those whose environment or health would be potentially affected by the decision on the proposed activity have an appropriate opportunity to participate in the decision;
- The population's contribution can influence the decision; and
- The concerns of all participants involved are considered in the decision-making process.

CEC staff and the Office of the Public Advisor, Energy Equity, and Tribal Affairs (PAO+) coordinated closely on public outreach early in the review process. The PAO+ outreach consisted of email outreach to elected officials, California Native American tribes, community and other organizations, businesses, schools, labor unions and trade associations, community centers, local residents, and others that had previously expressed interest in being informed of proposed project review and other activities through County events, outreach, and engagement.

CEC staff filed a Notice of Preparation of an Environmental Impact Report in the proceeding's docket on November 2, 2023, with the State Clearinghouse on November 3, 2023, and with the Shasta County Clerk on December 1, 2023. A public notice of the opt-in application was published in the Redding Searchlight newspaper on February 28, 2023. Staff also held a public informational and scoping meeting in Shasta County on November 28, 2023, which included multiple methods of outreach.

In accordance with the Governor's Executive Order B-10-11, the CEC's Tribal Consultation Policy, the CEC's Siting Regulations, and amendments to CEQA (i.e., Assembly Bill 52), staff conducted outreach and consultation with regional tribal governments. Additional information regarding the outreach efforts and specific groups contacted can be found in **Section 5.3, Cultural and Tribal Cultural Resources**.

As described in **Section 2, Introduction**, consistent with the noticing requirements under CEQA Guidelines Section 15087 staff mailed the Notice of Availability of the staff assessment to all owners and occupants contiguous to the project site, including to property owners within 1,000 feet of project site and 500 feet of project linear facilities using the list of assessor parcel numbers and owners submitted as required by California Code of Regulations, Title 20, Appendix B (a) (1) (E).

Environmental Justice Project Screening

For environmental justice concerns, the CEC staff has historically used a 6-mile radius surrounding the project site based on the potential distance of air pollution emissions from a natural gas powerplant can travel. While the proposed project does not include a thermal powerplant, staff retained the 6-mile distance due to the rural nature of the area with few residences close by and expansive size of the project site. Figure 6-1 presents the location of the project site, and the 2020 US Census tract boundaries contained within a 6-mile radius.

Tables 6-2 and 6-3 present income and race data of the regional and 6-mile radius area surrounding the project site. The socioeconomic data source is U.S. Census Bureau's American Community Survey (ACS) 2017-2021 5-Year Estimates (ACS 2021). Because ACS estimates come from a sample population, a certain level of variability is associated with the estimates. Supporting documentation on ACS data accuracy and statistical testing can be found on the ACS website in the Data and Documentation section available here: https://www.census.gov/programs-surveys/acs.html. For purposes of this analysis, U.S. Census ACS data was utilized to provide current data, consistency between the data used to identify minority and low-income populations, and consistency between the different geographies presented. The 2017-2021 ACS data uses the 2020 U.S. Census tract boundaries shown in Figure 6-1. For these reasons, U.S. Census ACS data is considered best available for representing the demographic makeup of affected communities in the project area. Use of published U.S. Census ACS data estimates is commonly used by CEQA Lead Agencies when performing analysis.

As shown in Table 6-2, one Census tract, and three block groups, contain a low-income population[3] greater than the larger comparative geography of Shasta County. Table 6-3 shows that no Census tracts contain a minority population greater than 50%. Census tract 126.06 has a greater percentage of low-income population than overall Shasta County. Additionally block groups 1 and 2 in tract 126.06 and block group 1 in 127.01 have greater percentages of low-income populations than overall Shasta County.

TABLE 6-2 INCOME STATISTICS FOR CALIFORNIA, SHASTA COUNTY, AND PROJECT 6-MILE RADIUS

Geography	Total Population (whose poverty status is known)	People with Ratio of Income to Poverty 2.0 and under	Percent Low-Income
California	38,701,352	11.040,032	28.5
Shasta County	178,903	59,273	33.1
Census Tract 126.05	1,781	361	20.3
Block Group 1 (tract 126.05)	1,781	361	20.3

3 Low-income population is defined when the percent of a population (i.e., in a county or Census tract) in households is less than or equal to twice the poverty level. The ACS low-income information is from Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."

TABLE 6-2 INCOME STATISTICS FOR CALIFORNIA, SHASTA COUNTY, AND PROJECT 6-MILE RADIUS

Geography	Total Population (whose poverty status is known)	People with Ratio of Income to Poverty 2.0 and under	Percent Low-Income
Census Tract 126.06	**3,320**	**1,573**	**47.4**
Block Group 1 (tract 126.06)	**1,521**	**665**	**43.7**
Block Group 2 (tract 126.06)	**1,799**	**908**	**50**
Census Tract 127.01	4,523	1,492	33
Block Group 1 (tract 127.01)	**1,364**	**456**	**33.4**
Block Group 2 (tract 127.01)	773	190	24.6

Notes: Low-income population is defined when the percent of a population (i.e., in a county or Census tract) in households is less than or equal to twice the poverty level. This definition is consistent with federal tools EJScreen and the Climate and Economic Justice Screening Tool (CEQ, 2022; U.S. EPA, 2024). The ACS low-income information is from Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months." Bold rows show population where low-income population percentage is greater than the larger comparative geography (Shasta County).
Source: ACS, 2021

TABLE 6-3 RACE STATISTICS FOR CALIFORNIA, SHASTA COUNTY, AND PROJECT 6-MILE RADIUS

Geography	Total Population	People of Color	Percent People of Color
California	39,455,353	25,346,056	64.2
Shasta County	181,935	39,987	22
Census Tract 126.05	1,809	245	13.5
Block Group 1 (tract 126.05)	1,809	245	13.5
Census Tract 126.06	3,472	1,096	31.6
Block Group 1 (tract 126.06)	1,647	385	23.4
Block Group 2 (tract 126.06)	1,825	711	39
Census Tract 127.01	4,564	535	11.7
Block Group 1 (tract 127.01)	1,364	148	10.9
Block Group 2 (tract 127.01)	773	167	21.6

Notes: To calculate percent people of color, the following equation was used: (Total Population: All races/ethnicities – Total Population: Non-Hispanic, White Alone) / (Total Population: All races/ethnicities) from Table B03002, "Hispanic or Latino Origin by Race," in the ACS 2021.
Source: ACS, 2021

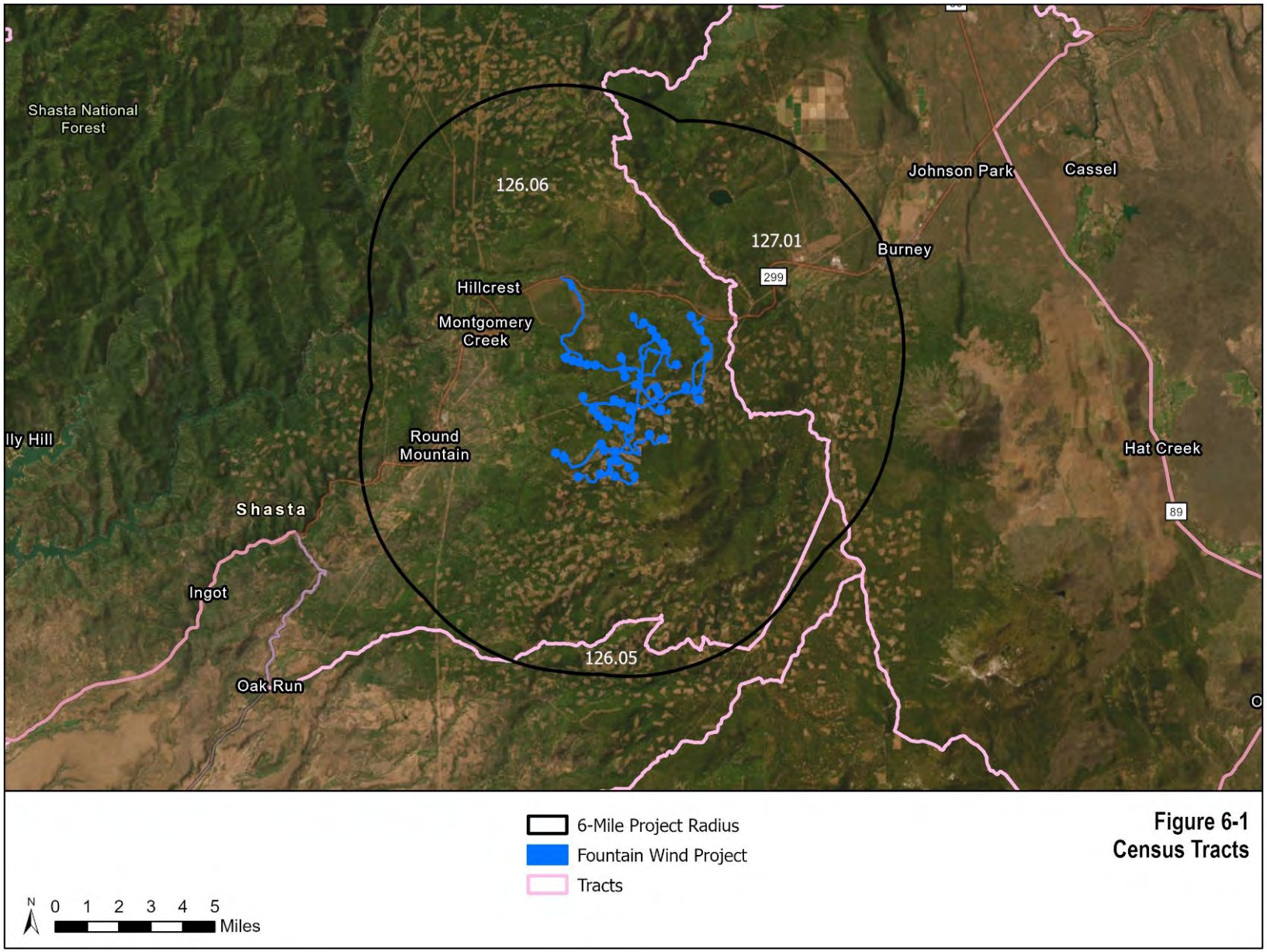


Figure 6-1
Census Tracts

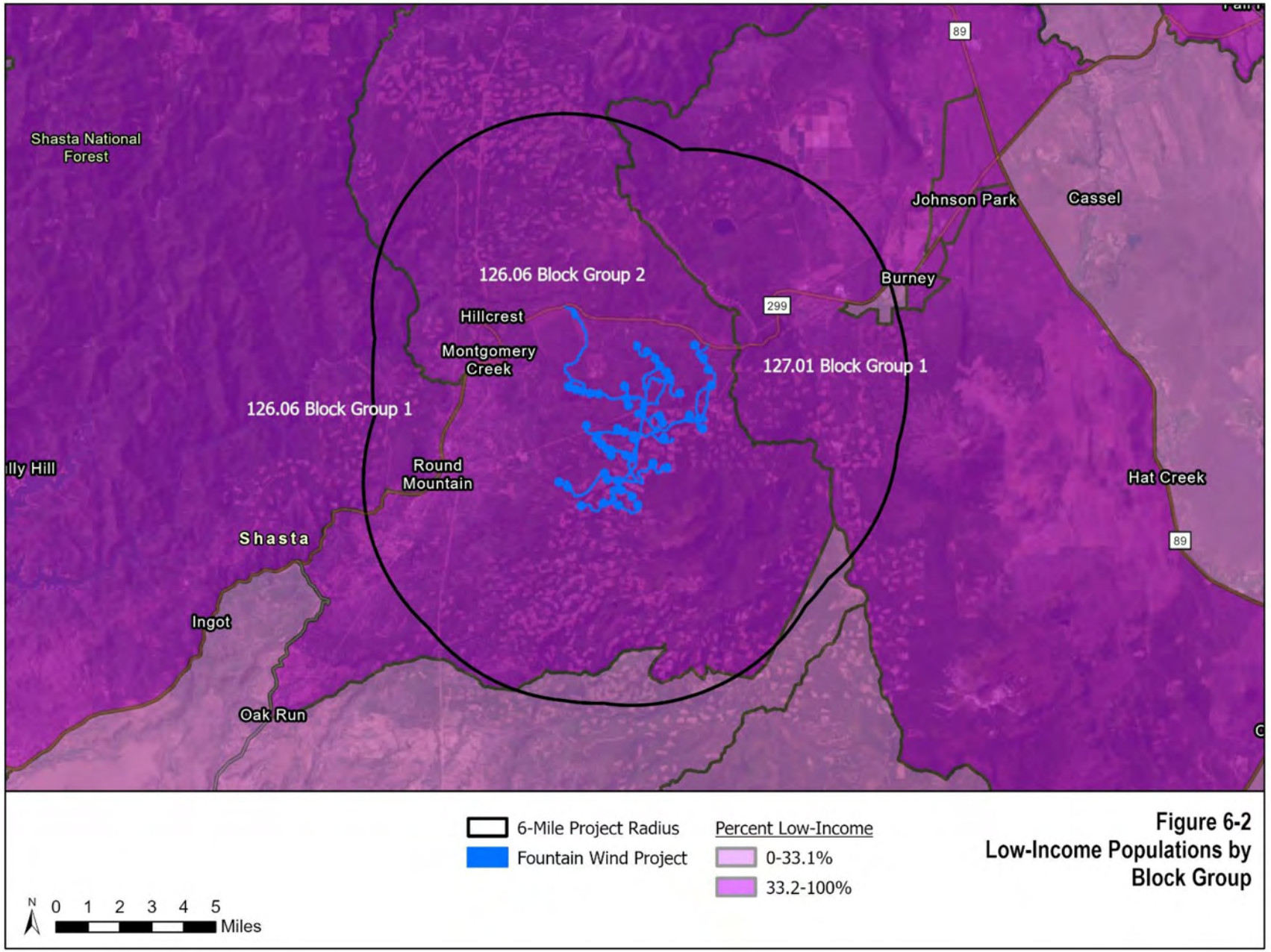


Figure 6-2
Low-Income Populations by Block Group

CalEnviroScreen

CalEnviroScreen (CES) 4.0 was used to gather additional information about the population potentially impacted by the proposed project. The CalEnviroScreen indicators (See Table 6-1) are used to measure factors that affect the potential[4] for pollution impacts in EJ communities. Staff used CalEnviroScreen to identify if additional disadvantaged communities[5] were in the vicinity of the proposed project and better understand the characteristics of the areas where impacts would occur.

Tables 6-4 through 6-6 present the CalEnviroScreen overall scores and indicators for the two Census tracts within a 6-mile radius of the project site. It must be noted that CalEnviroScreen uses 2010 Census tracts, which are different from the updated Census tracts used in Tables 6-2 and 6-3 above. As seen in Table 6-4, no disadvantaged communities by Census tract were identified by the CalEPA criteria.

TABLE 6-4 CALENVIROSCREEN OVERALL SCORES FOR CENSUS TRACTS WITHIN A 6-MILE RADIUS

Census Tract No.	Total Population	CES 4.0 Percentile	Pollution Burden Percentile	Population Characteristics Percentile
06089012601	5,123	17	16	21
06089012701	4,881	40	16	62

Notes: There are no CES disadvantaged communities by Census tract in the project's 6-mile radius.
Source: CalEnviroScreen

4 It is important to note that CalEnviroScreen is not an expression of health risk and does not provide quantitative information on increases of impacts for specific sites or projects. CalEnviroScreen uses the criteria of "proximity" to a hazardous waste site, a leaking underground tank, contaminated soil, an emission stack (industry, power plant, etc.) to determine that a population is "impacted." It does not address general principles of toxicology: dose/response and exposure pathways. For certain toxic chemicals to pose a risk to the public, offsite migration pathways must exist (through ingestion, inhalation, dermal contact, etc.) and contact to a certain amount – not just any amount – must exist.

5 The CalEPA, for purposes of its Cap-and-Trade Program, defines communities in terms of census tracts and identifies four types of geographic areas as disadvantaged: (1) census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0; (2) census tracts lacking overall scores in CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores; (3) census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0; (4) and areas under the control of federally recognized Tribes. (CalEPA 2022).

TABLE 6-5 CALENVIROSCREEN INDICATOR PERCENTILES FOR POLLUTION BURDEN FOR CENSUS TRACTS WITHIN A 6-MILE RADIUS

Census Tract No.	Percentiles													
	Pollution Burden	Ozone	PM2.5	Diesel PM	Drinking Water	Lead	Pesticides	Toxic Release	Traffic	Cleanup Sites	Groundwater Threats	Hazardous Waste	Impaired Water Bodies	Solid Waste
06089012601	16	61	2	1	65	14	25	3	1	0	55	17	72	83
06089012701	16	55	1	3	9	48	51	1	1	26	26	36	44	94

Note: There are no CES disadvantaged communities by census tract within the project's 6-mile radius.
Source: CalEnviroScreen

TABLE 6-6 CALENVIROSCREEN INDICATOR PERCENTILES FOR POPULATION CHARACTERISTICS FOR CENSUS TRACTS WITHIN A 6-MILE RADIUS

Census Tract No.	Percentiles								
	Population Characteristics	Asthma	Low Birth Weight	Cardiovascular Disease	Education	Linguistic Isolation	Poverty	Unemployment	Housing Burden
06089012601	21	15	48	21	29	0	60	57	24
06089012701	62	52	50	90	62	24	70	77	25

Note: There are no CES disadvantaged communities by census tract within the project's 6-mile radius.
Source: CalEnviroScreen

Disadvantaged Communities

No CES Census tracts within 6 miles of the project site are considered disadvantaged under the CalEPA designation of disadvantaged communities for the purpose of SB 535 because both Census tracts within the 6-mile boundary were below the threshold of receiving the highest 25% of overall scores in CalEnviroScreen 4.0. CalEnviroScreen currently uses 2010 Census tract data.

It should be noted that under the broader CalEPA designation of "disadvantaged communities" as defined by CalEPA to comply with SB 535 guidance, there are disadvantaged communities within the 6-mile boundary. Figure 6-3 shows disadvantaged communities based on the designation criterion "Lands under the control of federally recognized tribes." These communities include Roaring Creek Rancheria, Montgomery Creek Rancheria, and Pit River Trust Land. Table 6-2 and Figure 6-2 are based on the 2021 Census ACS data. This data shows one Census tract, and three block groups have greater percentages of low-income populations below the poverty level than overall Shasta County, and are considered disadvantaged under the low-income criterion.

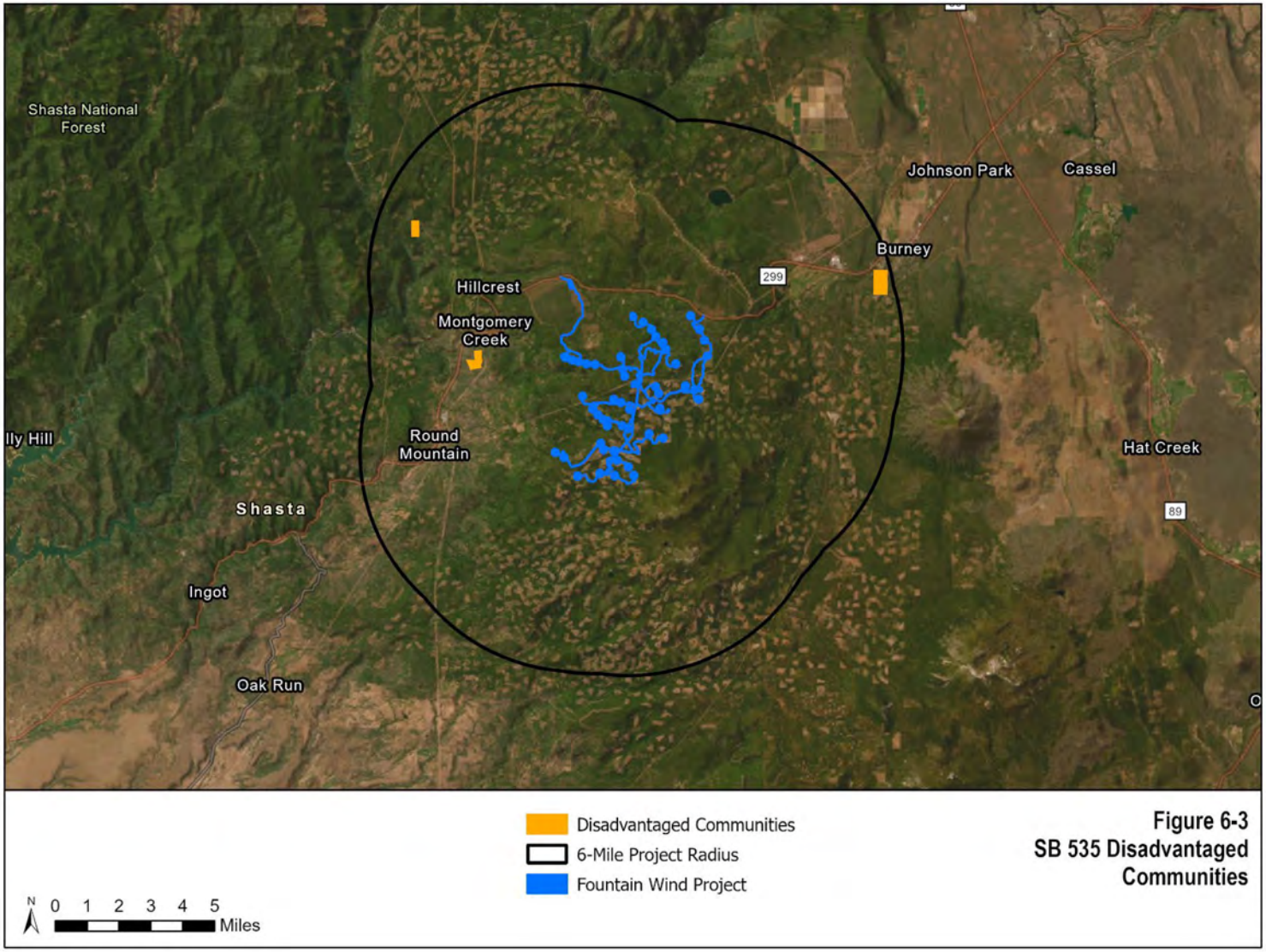


Figure 6-3
SB 535 Disadvantaged Communities

6.2 Environmental Impacts

The following technical areas discuss project-related nuisance effects on EJ populations: Air Quality; Cultural and Tribal Cultural Resources; Hazards, Hazardous Materials, and Wildfire; Noise and Vibration; Public Health; Solid Waste Management; Transportation; Visual Resources; and Water Resources.

Air Quality

Staff identified the potential air quality impacts (i.e., ozone and PM2.5) that could affect the EJ population by examining the individual contributions of these indicators in CalEnviroScreen that are relevant to air quality. The results indicate that the project's criteria pollutant emissions would not occur at rates that could be cumulatively significant. The local cumulative concentrations of air pollutants are dominated by the combined effects of existing, background stationary, and mobile sources. The proposed project would contribute to impacts during short-term construction, but would not contribute considerably to the cumulative concentrations and therefore no disproportionate impacts on the EJ population would occur.

Ozone Concentrations. The exposure indicator in CalEnviroScreen for ozone concentrations represents the potential adverse health effects, including respiratory irritation and exacerbation of lung disease, resulting from ground level ozone. This indicator is defined by the mean of summer months (May-October) of the daily maximum 8-hour ozone concentration. Communities in the project area are not exposed to high ozone concentrations as compared to the rest of the State. The project would not be expected to contribute significantly to regional ozone concentrations because the project with mitigation would not exceed the emission rate significance thresholds for NOx and VOCs, which are the precursor pollutants that lead to ozone formation. Therefore, the project would not contribute significantly to regional ozone concentrations, relative to baseline conditions.

PM2.5 Concentrations. The exposure indicator in CalEnviroScreen for PM2.5 concentrations represents the potential adverse health effects, including heart and lung disease, of persistent exposure to PM2.5. This indicator is defined by the annual mean concentration of PM2.5. Communities in the project area are not exposed to high PM2.5 concentrations as compared to the rest of the state. The project would not be expected to contribute significantly to regional PM2.5 concentrations because the project with mitigation would be reduced to levels that would not be cumulatively considerable. Therefore, the project would not contribute significantly to regional PM2.5 concentrations, relative to baseline conditions.

Cultural and Tribal Cultural Resources

The project site is located within a cultural landscape that Staff refers to as the Montgomery-Hatchet Creek Tribal Cultural Landscape, which was identified through research and formal tribal consultation with the Pit River Tribe, an EJ population. The

tribal cultural landscape includes resources (biological, cultural, and topographical) that are significant to the tribe. All these features of the cultural landscape coalesce in the drainages of Hatchet and Montgomery creeks where the applicant proposes to build the project. Modern tribal communities retain their lengthy and intimate connection to this place and claim continuity of use today. In addition, numerous discrete tribal cultural resources are in the proposed project site or within its viewshed. The project's intrusive turbines would significantly impact cultural characteristics of the project site and vicinity by adding noise and lighting into a little-developed rural area, intruding on its natural characteristics and tranquility, which are vital to the cultural landscape. In consultation with Pit River Tribe, Staff has concluded that the proposed project would have significant and unmitigable impacts on the Montgomery-Hatchet Creek Tribal Cultural Landscape (see **Section 5.4, Cultural and Tribal Cultural Resources**). Therefore, project activities would result in a disproportionate impact on the EJ population.

Hazards, Hazardous Materials, and Wildfire

Hazards and Hazardous Materials. EJ populations may experience disproportionate hazards and hazardous materials impacts if the storage and use of hazardous materials within or near EJ communities occur to a greater extent than within the community at large, or if the project would contribute to or exacerbate the effects of cleanup sites and hazardous waste generators and facilities. A disproportionate impact upon the EJ population can also result from the planned storage and use of hazardous materials on the project site. COCs presented in **Section 5.7, Hazards, Hazardous Materials, and Wildfire** would ensure that any hazardous material brought onto the project site would be stored per the applicable laws, ordinances, regulations, and standards (LORS). Therefore, the likelihood of a spill or release of sufficient quantity to impact the surrounding community would be very unlikely and considered less than significant with mitigation incorporated. Since the overall CalEnviroScreen score reflects the collective impacts of multiple pollutants and factors, staff examined the individual contributions to indicators as they relate to hazardous materials presented in its analysis. Neither construction nor operation of the project is expected to generate significant hazardous waste other than those generated during equipment maintenance, such as used lubricating oils and old batteries. Hazardous materials of concern in this analysis are those from construction and operational activities. The handling and disposal of each type of hazardous material depends on the hazardous ranking of its constituent materials. Existing LORS ensure the desired handling and disposal of hazardous material and hazardous waste materials to prevent potential public or environmental health impacts. No disproportionate impacts on the EJ population are anticipated.

Cleanup Sites. This CalEnviroScreen indicator is calculated by considering the number of cleanup sites including Superfund sites on the National Priorities List (NPL), the weight of each site, and the distance to the census tract. Sites undergoing cleanup actions by governmental authorities, or by property owners, have suffered environmental degradation due to the presence of hazardous substances. Of primary concern is the potential for people to come in contact with these substances. There are

no NPL or Superfund sites within the tracts identified in the EJ study area. Contamination threats due to the presence of cleanup sites are among the lowest of all tracts Statewide. In addition, there would be no impact from encountering known or unknown contaminated soil at the project site, and as such there would be no disproportionate impacts on the EJ population.

Hazardous Waste Generators and Facilities. This indicator is calculated by considering the number of permitted treatment, storage, and disposal facilities (TSDFs) or generators of hazardous waste, the weighting factor of each generator or site, and the distance to the census tract. Most hazardous waste must be transported from hazardous waste generators to permitted TSDFs by registered hazardous waste transporters. Most shipments must be accompanied by a hazardous waste manifest. There are widespread concerns for both human health and the environment from sites that serve for the processing and disposal of hazardous waste. Newer facilities are designed to prevent the contamination of air, water, and soil with hazardous material. However, even newer facilities may negatively affect perceptions of surrounding areas in ways that have economic, social, and health impacts. The identified EJ populations in the study area are on the lower end of tracts within the State in terms of threats related to hazardous waste generation and facilities, meaning that the affected communities are located alongside sites with low relative proportion of hazardous waste generators and facilities. As of 2020, there is only one identified hazardous waste generator in tract 06089012601 and only three identified hazardous waste generators in tract 06089012701 (OEHHA 2021).

The project would not contribute significantly to hazardous waste generation and would not contribute to the number or size of facilities handling hazardous waste processing. Further, the project would be required to comply with appropriate LORS to control storage and disposal of hazardous materials and hazardous waste during its construction and operation phases. The project would implement modern operational controls to prevent or reduce the generation of hazardous wastes and to dispose of them in a manner that would minimize impacts to the environment both during project construction and operation. The project's impacts related to hazardous waste generation and disposal would be reduced to less than significant for the project, and there would be no disproportionate impacts on the identified EJ population.

Wildfire. The project site is within an area that contains an EJ population based on low-income criteria. The entire project and surrounding areas have been designated by CalFire as being within a very high fire hazard zone. These are areas with significant fire hazards based on fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, typical fire weather for the area, and other relevant factors. COCs presented in **Section 5.7, Hazards, Hazardous Materials, and Wildfire** would reduce the potential for the project to trigger a wildfire, and in the event a wildfire is triggered on the project site, COCs would reduce the potential that wildfire would spread beyond the project site. However, there is a potentially significant and unmitigable wildfire effect due to aerial firefighting challenges, as described in

Section 5.7, Hazards, Hazardous Materials, and Wildfire. Effects of wildfires in forested parts of Shasta County and surrounding areas would be subject to the location and size of each future potential wildfire, which is not predictable, but would equally affect all communities near to wildfires. Any potential increase in likelihood of a wildfire from the project would affect the communities nearest the project site. Smoke from wildfires spreads from the source fire depending on wind and atmospheric conditions and would affect all communities equally in areas "downwind" or within the smoke dispersion area. Because the project and the immediate surrounding areas are identified as low-income EJ populations, any wildfire impacts would likely affect those in closest proximity first. If a wildfire were to occur, these effects would result in disproportionate impacts on the EJ population.

Noise and Vibration

EJ populations may experience disproportionate noise impacts if the siting of unmitigated industrial facilities occurs within or near EJ communities to a greater extent than within the community at large. The project site is within an area that contains an EJ population. The area surrounding the site is primarily managed forest land. The nearest residence to any single turbine is approximately 5,000 feet away. Construction activities would increase existing noise levels at the nearest residence, but effects would be temporary and intermittent. The County General Plan does not establish noise level thresholds for construction activities. However, for discretionary projects, construction activities shall be limited to hours of 7:00 A.M. to 7:00 P.M., Monday through Saturday. No construction shall be permitted on Sundays and federal holidays. The project has proposed construction activities that would occur during the daytime hours between 7:00 A.M. and 5:00 P.M., with potential adjustments in the summer months. While construction of the proposed project would temporarily increase noise levels at the nearest residences, since there are no noise-sensitive land uses in the immediate vicinity of the nearest turbines, construction activities would not result in a disproportionate impact on the EJ population.

Wind turbine operations and maintenance activities would be the primary sources of operational noise. Since the turbines would not be located adjacent to, or in close proximity of, a residential land use, no noise reduction measures would be required, and operation of the project would not result in any disproportionate impacts on the EJ population.

Public Health

Staff identified the potential public health impacts (i.e., cancer and non-cancer health effects) that could affect the EJ population. Potential public health risks were evaluated quantitatively based on the most sensitive population, which includes the EJ population, by conducting a health risk assessment (HRA). The results were presented by levels of risk, and results indicate that there would not be any significant adverse cancer or short- or long-term noncancer health effects to any members of the public. Therefore, no disproportionate impacts on the EJ population are expected to occur.

Diesel PM Emissions. The exposure indicator in CalEnviroScreen for diesel PM emissions represents the adverse health effects including irritation to the eyes, throat and nose, cardiovascular and pulmonary disease, and lung cancer, from concentrated sources of diesel PM emissions. This indicator is defined by the spatial distribution of diesel PM emissions from on-road and non-road sources. Communities in the project area are not exposed to high diesel PM emissions as compared to the rest of the state. Impacts associated with diesel PM from the proposed project construction and operation activities (diesel-fueled equipment) would be less than significant and would not have a significant cumulative contribution to the diesel PM levels in the general population or in disadvantaged communities. Therefore, the project's diesel PM impacts would not have a disproportionate impact on the EJ population.

Pesticide Use. The exposure indicator in CalEnviroScreen for pesticide use represents certain high-hazard, high-volatility substances that may lead to unintended environmental damage. This indicator is defined by the total mass of active pesticide ingredients (filtered for hazard and volatility) used in production-agriculture areas. Communities in the project area are not exposed to high pesticide concentrations as compared to the rest of the state. Pesticide use by the project would be less than significant for the general population. There would not be any disproportionate impacts on the EJ population.

Toxic Releases from Facilities. The exposure indicator in CalEnviroScreen for chemical releases is defined by the toxicity-weighted concentrations of modeled chemical releases to air from facility emissions and off-site incineration. Communities in the project area are not exposed to high toxic releases from facilities as compared to the rest of the state. Emissions of toxic air contaminants by the project would be less than significant for the general population. There would not be any disproportionate impacts on the EJ population.

Traffic Impacts. The exposure indicator in CalEnviroScreen for traffic impacts represents the vehicles in a specified area, resulting in human exposures to chemicals that are released into the air by vehicle exhaust. Communities in the project area are not exposed to high traffic impacts as compared to the rest of the state. This indicator is defined by the sum of traffic volumes adjusted by road segment length. The proposed project would generate vehicle trips to the site. These trips include workers, material, and equipment deliveries. Impacts associated with vehicle exhaust from the proposed project construction and operation activities (diesel-fueled equipment) would be less than significant and would not have a significant cumulative contribution to the traffic density in the disadvantaged communities. Therefore, the project's traffic impact would not have a significant cumulative contribution to the traffic density for the local general population. There would not be any disproportionate impacts on the EJ population.

Asthma. The sensitive population indicator in CalEnviroScreen for asthma represents asthma rates defined by the number of emergency department visits for asthma per

10,000 people. Communities in the project area do not include populations with high numbers of emergency department visits for asthma when compared to the rest of the state. Health effects of air contaminants emitted by the project would be less than significant for the local population. There would not be any disproportionate impacts on the EJ population.

Low Birth Weight Infants. The sensitive population indicator in CalEnviroScreen for low birth-weight infants represents an increased risk of health problems later in life as well as infant mortality. This indicator is defined by the percentage of babies born weighing less than 2,500 grams (about 5.5 pounds) out of the total number of live births. Communities in the project area do not include populations with high numbers of low birth-weight babies when compared to the rest of the state. Health effects of air contaminants emitted by the project would be less than significant for the project, and there would not be any disproportionate impacts on the EJ population.

Cardiovascular Disease. The sensitive population indicator in CalEnviroScreen for cardiovascular disease represents the rates of heart attacks defined by the number of emergency department visits for acute myocardial infarction (or heart attack) per 10,000 people. One CES census tract in the project area includes a population with high numbers of cardiovascular disease when compared to the rest of the state. However, health effects of air contaminants emitted by the project are anticipated to be less than significant, and thus there would not be any disproportionate impacts on the EJ population.

Solid Waste

The handling and disposal of each type of project related construction- and operation-related waste is dependent on the hazardous ranking of its constituent materials. Existing LORS ensure the desired handling and disposal of waste materials without potential public or environmental health impacts. The rural communities within a 6-mile radius of the project are sparsely populated, and as shown in **Table 6-2** and **Figure 6-2,** there are areas (three Block Groups within two Census Tracts) with higher percentages of low-income populations. CalEnviroScreen scores for the Solid Waste Facilities category indicate that the number and type of facilities within or nearby these areas are among the highest Statewide. Solid waste generated during the construction and operation of the project would be segregated, where practical, for recycling, and would be disposed of where there is adequate capacity for non-hazardous waste. Also, the project would be required to develop and implement plans that would ensure proper disposal of nonhazardous waste at appropriately licensed facilities. The project owner would use solid waste sites or facilities that are verified to be in compliance with current applicable LORS. In addition, there would be no increase in solid waste generators and facilities in the area due to project construction or operation because there is adequate capacity to dispose of waste from the project. Since there would be

no project-related significant impact related to solid waste facilities, the EJ population in the area are not anticipated to bear any associated disproportionate impacts.

Transportation

Generally, reductions in transportation options may significantly impact EJ populations. In particular, an impact to bus transit, pedestrian facilities, or bicycle facilities could cause disproportionate impacts to low-income communities, as low-income residents more often use these modes of transportation. As concluded in **Section 5.14, Transportation**, all transportation impacts, including impacts to alternative modes of transportation, would be less than significant. The transportation impacts would not have disproportionate impacts on the EJ population.

Visual Resources

The viewshed for the project contains EJ populations (i.e., low-income populations) as shown in Figure 6-2 and in Table 6-2. Visual resource impacts from the proposed project would include obstructions to a scenic vista, degradation of the landscape's existing visual character, and the creation of a new source of nighttime lighting (see discussion in **Section 5.15, Visual Resources**). The extent of these visual resource impacts would be limited to the viewshed surrounding the project, which includes three block groups that contain a low-income population greater than the larger comparative geography of Shasta County. As such, the EJ population within the project's viewshed would be disproportionately impacted by the project's impact related to visual resources.

Water Resources

The project is required to comply with the Clean Water Act (CWA) and California's Porter-Cologne Water Quality Control Act by controlling the discharge of pollutants during its construction and operation phases. In addition, the majority of drinking water is supplied from surface water sources from outside of the area. Also, the project would implement modern storm water and containment controls that would improve upon the site's potential to release contaminants to the environment. The project's water resources impacts are expected to be less than significant.

A disproportionate impact related to water resources could occur if the project contributes to drinking water degradation, exacerbates groundwater contamination, or discharges additional pollutants to impaired surface water bodies. For stationary stressors related to water resources, the weighting factor diminishes to zero for distances larger than 1,000 meters (0.6 mile). The rural communities within a 6-mile radius of the project are sparsely populated, and as shown in **Table 6-2** and **Figure 6-2,** there are areas (three Block Groups within two Census Tracts) with higher percentages of low-income populations.

Drinking Water Contaminants. CalEnviroScreen aggregates drinking water quality data from the California Department of Public Health, the U.S. EPA, and the California

State Water Resources Control Board (SWRCB). The score provided by the Drinking Water Contaminant metric calculation is intended to rank water supplies relative to their history or likelihood to provide water that exceeds drinking water standards. Low-income rural communities, particularly those served by small community water systems, can be disproportionately exposed to contaminants in their drinking water. The rural communities within a 6-mile radius of the project are sparsely populated, and although there are areas with high percentages of low-income populations (see **Table 6-2** and **Figure 6-2**), CalEnviroScreen scores indicate that the drinking water contamination threat in the area is very low to moderate, and that the community does not have a significant level of exposure to contaminants through drinking water. In addition, the project is not expected to contribute significantly to drinking water source degradation. Therefore, no disproportionate impacts on the area's low-income EJ population are anticipated.

Groundwater Threats. Common groundwater pollutants found at contaminant release sites in California include gasoline and diesel fuels; chlorinated solvents and other volatile organic compounds; heavy metals such as lead, chromium, and arsenic; polycyclic aromatic hydrocarbons; persistent organic pollutants like polychlorinated biphenyls and pesticides; and perchlorate. CalEnviroScreen aggregates data from the SWRCB's GeoTracker website about groundwater threats. The CalEnviroScreen score provided by the Groundwater Threat metric calculation is intended to rank the relative risk of environmental impact by groundwater contamination. Although there are areas with high percentages of low-income populations (see **Table 6-2** and **Figure 6-2**), CalEnviroScreen scores indicate that the threat from contaminated groundwater sites to the communities within the area is low to moderate. The project is not expected to exacerbate groundwater contamination, relative to existing conditions. Requirements to comply with the CWA by controlling the discharge of pollutants during project construction and operation; and implementation of modern storm water and containment controls would limit the site's potential to release contaminants to groundwater. Therefore, the project is not expected to degrade groundwater quality any further than baseline conditions. No project-related disproportionate impacts related to groundwater would affect the EJ population.

Impaired Water Bodies. CalEnviroScreen aggregates data from the SWRCB's Final 2012 California Integrated Report (CWA Section 303(d) List/305(b) Report). The score provided by the Impaired Water Bodies metric calculation is intended to rank the relative risk of impaired water bodies within each census tract. There are areas with high percentages of low-income populations (see **Table 6-2** and **Figure 6-2**) within a 6-mile radius of the project. CalEnviroScreen scores indicate that the threat to impaired water bodies in these areas is moderate to high. However, the project is not expected to further impair local water bodies because it is required to comply with the CWA by controlling the discharge of pollutants during its construction and operation phases. In addition, the project would implement modern storm water and containment controls that would limit the site's potential to release contaminants to the environment. No

disproportionate impacts on the low-income EJ population using the area's water bodies would occur.

6.3 References

ACS 2021 – American Community Survey (ACS). 2017-2021 ACS 5-year Estimates. Tables C17002 (Ratio of Income to Poverty Level in the Past 12 Months) and B03002 (Hispanic or Latino Origin by Race) Accessed online at: https://data.census.gov/

CalEPA 2022 – California Environmental Protection Agency (CalEPA). Final Designation of Disadvantage Communities Pursuant to Senate Bill 535, May 2022. Accessed online at: https://calepa.ca.gov/wp-content/uploads/sites/6/2022/05/Updated-Disadvantaged-Communities-Designation-DAC-May-2022-Eng.a.hp_-1.pdf

CEQ 2022 – Council on Environmental Quality (CEQ). Climate and Economic Justice Screening Tool. Technical Support Document. Version 1.0. Accessed online at: https://static-data-screeningtool.geoplatform.gov/data-versions/1.0/data/score/downloadable/1.0-cejst-technical-support-document.pdf

OEHHA 2021 – California Environmental Protection Agency's Office of Environmental Health Hazard and Assessment (OEHHA). CalEnviroScreen 4.0, October 2021. Accessed online at: https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf

LCI 2020 – Office of Land Use and Climate Innovation (LCI). General Plan Guidelines. Chapter 4: Required Elements. 4.8 Environmental Justice Element. Accessed online at: https://lci.ca.gov/docs/20200706-GPG_Chapter_4_EJ.pdf

U.S. EPA 2015 – United States Environmental Protection Agency (U.S. EPA). Guidance on Considering Environmental Justice During the Development of Regulatory Actions, May 2015. Accessed online at: https://www.epa.gov/environmentaljustice/guidance-considering-environmental-justice-during-development-action

U.S. EPA 2023 – United States Environmental Protection Agency (U.S. EPA). Summary of Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. 59 FR 7629; February 16, 1994. Accessed online at: https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

U.S. EPA 2024 – United States Environmental Protection Agency (U.S. EPA). Environmental Justice Mapping and Screening Tool. EJScreen Technical Documentation for Version 2.3. Accessed online at: https://www.epa.gov/system/files/documents/2024-07/ejscreen-tech-doc-version-2-3.pdf

White House 2023 – The White House (White House). Executive Order on Revitalizing Our Nation's Commitment to Environmental Justice for All. Accessed online at:

https://www.whitehouse.gov/briefing-room/presidential-actions/2023/04/21/executive-order-on-revitalizing-our-nations-commitment-to-environmental-justice-for-all/

Section 7

Public Benefits

7 Public Benefits

7.1 Regulatory Setting

Assessment of the project's benefits must be evaluated under four related frameworks with distinct purposes. This includes an evaluation of: (1) public benefits, (2) benefits related to an override finding, (3) net positive economic benefit to the local government, and (4) community benefits (as set forth in Public Resources Code sections 25523(h), 25525, 25545.9, and 25545.10, respectively). This section discusses the first framework, public benefits. For a discussion on net positive benefit to the local government and community benefits, see **Section 10, Mandatory Opt-In Findings** and for benefits related to an override finding, see **Section 11, Override Findings and Recommendations**.

Public Resources Code section 24454.8 incorporates Public Resources Code section 25523(h), which states: "The commission shall prepare a written decision after the public hearing on an application, which includes ...[a] discussion of any public benefits from the project including but not limited to, economic benefits., environmental benefits, and electricity reliability benefits." Such identified benefits may be discussed in detail in various sections of staff's environmental assessment such as socioeconomic and utilities and service systems. A qualitative discussion addressing public benefits is appropriate as there is no specific threshold of benefit necessary under this section for project approval. Consistent with this directive, staff describes in summary form the key benefits of the project relating to economic, environmental and reliability benefits of the project.

This is in comparison to the local government net benefit requirements of Public Resources Code section 25545.9 which sets a threshold that must be met for the project to be approved, "The commission shall not certify a site and related facility under this chapter unless the commission finds that the construction or operation of the facility will have an overall net positive economic benefit to the local government...". See **Section 10, Mandatory Opt-In Findings** for the analysis on the project's net economic benefits to Shasta County. The statutory language requiring an overall net positive economic benefit to the local government, indicates the need for a more quantitative analysis to support the requisite finding of net positive economic benefit to the County. Importantly, project costs to the County must be determined, to the extent feasible, so that a realistic net economic impact can be arrived at. Only if this net impact is positive can the project be potentially approved.

7.2 Economic, Environmental and Electric Reliability Public Benefits

Economic

As detailed in **Section 5.11, Socioeconomics**, **Section 10, Mandatory Opt-In Findings,** and **Section 11, Override Findings and Recommendations**, the project's public benefits include economic benefits typical for a large-scale industrial project with long construction periods. These benefits include various types of construction jobs and

associated payrolls, sales taxes, equipment rentals, and local spending related to the project and from its workers. Once construction is completed, the project will employ a minimal number of staff. The project will also contribute various types of taxes to the local community.

In addition to employment, local spending, and tax revenue from the project, the applicant has agreed to provide the Northeastern California Building and Construction Trades Council $175,000 for workforce training and development purposes, including workplace health and safety, job quality and job training, worker recruitment, screening, and hiring strategies and practices, targeted hiring planning and execution, investment in workforce training and education, and worker voice and representation in decision making affecting employment and training. Additionally, the agreement requires a portion of the funds to support conducting job fairs for the Project in both Redding and Burney and provide at least two month-long Multi-Craft Core Curriculum Trainings in both Redding and Burney on or before commencement of the Project's commercial operations.

Environmental

As discussed in **Section 8, Alternatives** and **Section 11, Override Findings and Recommendations** the project creates environmental benefits by supporting the states renewable energy and greenhouse gas emission goals under SB 100. Using the proposed project's total nameplate generating capacity of up to 205 MW and assuming a best-case average capacity factor of 32 percent, the project is anticipated to generate up to approximately 574,000 MWh of renewable energy per year. The project would provide a potential net offset of 214,000 MT CO2e per year, if the electricity generated by the project were to be used in place of electricity generated by fossil fuel sources. Unlike burning of fossil fuels to generate electricity, wind turbines do not emit air pollution providing potential social benefits, including fewer hospital visits for respiratory problems, including asthma, fewer sick days taken from work, and overall better health in the region.

Reliability

Reliability is an evaluation of the robustness of the state's electrical system, the grid, and the project's impact on that system. As discussed in **Section 8, Alternatives**, at page 8-47, no evidence in the record indicates that the region around the project has a reliability deficit, vulnerability or weakness addressed by the project. The applicant noted the site was selected because of access to the land and wind resources, not due to any reliability need and that the power would enter the general transmission system - not be provided specifically for local consumption (TN 250551). Overall, the project's reliability benefit is from contributing to the diversity of renewable generation in the state.

Conclusions

Consistent with Public Resources Section 25523(h), this section provides a summary description of the economic, environmental, and reliability benefits, to the extent there are any, of the project. More detailed information including project impacts are discussed in

the technical sections as well as in **Section 10, Mandatory Opt-In Findings** and **Section 11, Override Findings and Recommendations**.

7.6 References

FWPA – Fountain Wind Project Application (TN 250551). ALT-01_02 Site Selection and Project Objectives, dated June 8, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Section 8

Alternatives

8 Alternatives

8.1 Introduction

This section evaluates a reasonable range of potentially feasible alternatives to the Fountain Wind Project (project). As the California Environmental Quality Act (CEQA) lead agency for the project, the California Energy Commission (CEC) is required to identify and evaluate a range of reasonable alternatives to the project that would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the project's significant effects. The guiding principles for selection of the alternatives analyzed are derived from the CEQA Guidelines (Cal. Code Regs., tit. 14, section 15000 et seq.) described in detail below in the subsection "CEQA Requirements."

An alternatives analysis is also relevant to the CEC's determination, under the Warren-Alquist Act, of whether local laws that are inconsistent with the project would prevent approval of the project. As discussed in the Land Use, Forestry, and Visual Resources sections, the project is inconsistent with the Shasta County Code, section 17.88.335 which prohibits large wind facilities in unincorporated areas of the county, section 17.08.010, which establishes timber production zones, such as the project site, for timber harvesting, and the Scenic Highways Element of the Shasta County General Plan which is intended to establish and protect State or county roads with scenic value. Because of these inconsistencies the CEC "may not certify a facility" that does not conform with applicable laws unless the CEC "determines that the facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving public convenience and necessity. In making the determination . . . [the CEC must] consider the entire record of the proceeding, including, but not limited to, the impacts of the facility on the environment, consumer benefits, and electric system reliability" (Pub. Resources Code section 25525). See **Chapter 11, Override Findings and Recommendations** for a detailed analysis of overrides.

"Prudent" means "…[p]ractically wise, judicious, careful, discreet, circumspect, sensible" (Black's Law Dict. (5th ed. 1979) p. 1104, col.1). "Feasible" is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (California Code of Regulations, title 20, section 1201(h)).

In assessing whether an alternative is a more prudent and feasible means of achieving the public convenience and necessity, the analysis considers the ways the alternative meets the same relevant project and statutory objectives as the proposed facility, including: grid reliability, renewable energy development, reduction in greenhouse gas emissions, environmental protection, and consumer benefits, etc., that make the proposed project necessary for public convenience and necessity, as well as the feasibility elements of time to completion, economic, legal, social, and technological factors.

If the CEC determines the project is required for public convenience and necessity, the CEC will need to consider the following alternatives analysis to make a finding on whether an alternative is more prudent and feasible. If the CEC finds an alternative is more prudent and feasible, the proposed project cannot be approved (Public Resources Code section 25525).

In developing alternatives for consideration, CEC staff reviewed all relevant filings by the applicant related to the proposed project. First, staff has reviewed the alternatives analysis provided by the applicant in the 2020 Fountain Wind Project Draft Environmental Impact Report (EIR) (Chapter 4) (Shasta County 2020a). The 2020 Draft EIR evaluated two alternatives (i.e., "Alternative 1, South of SR 299" and "Alternative 2, Increased Setbacks") that were ultimately incorporated into the current proposed project design being reviewed under this EIR. No other feasible alternatives were identified in the 2020 Draft EIR (Shasta County 2020a). As such, the 2020 Draft EIR provides no alternatives.

During CEC staff review of the project application for completeness, staff requested information from the applicant (as docketed in TN 248742, TN 248759, TN 250553, and TN 250956) related to: the power generation needs at the proposed project site in the context of the area's electric system; the specific criteria the applicant used to select the proposed project site over alternative sites; and identification of alternative sites that could be evaluated in the EIR (CEC 2023a and 2023b, Stantec 2023b and 2023c). The applicant's responses to these data adequacy requests (TN 250551, TN 250956, and TN 251462) did not provide the specific information regarding the electric generation needs for the project area or the criteria used to select the proposed site (Stantec 2023a, 2023c, and 2023d). There is information in the record that indicates that the county or region does not have any electricity reliability issues that the project is designed to address. The applicant confirmed the electricity will enter the state's transmission system and the project's generation is not specifically servicing the county. The location was selected due to wind resources, site accessibility, and available transmission (See Project Description TN 254794 pp. 4,7 and Response to Data Request ALT-1 and ALT-2, TN 250551 pp.1-7.).

Regarding an alternative site, the applicant provided a figure identifying the location of a potentially suitable site based on a preliminary desktop screening (TN 251462) (Stantec 2023d). This alternative site description served as a starting point for staff to develop an off-site alternative for analysis in this EIR. Additional alternatives analyzed by staff within this section include those recommended through agency and public comment, as well as those developed by staff based on significant impacts identified for various technical issue areas. After considering the many suggestions, staff has concluded that two alternatives cannot be ruled out initially as infeasible, specifically a technology alternative and a reduced project alternative.

The No Project Alternative, Battery Energy Storage System Alternative (i.e., technology alternative), and the Reduced Project Alternative have been compared to the Fountain Wind Project to determine if they meet the basic objectives of the proposed project and

would reduce or avoid any significant environmental impacts of the proposed project as defined by CEQA. To address the inconsistency with applicable laws, ordinances, regulations, and standards (LORS), alternatives carried forward are analyzed to see if any are a more prudent and feasible means of achieving public convenience and necessity. Alternatives eliminated from detailed analysis are also discussed in this section, including the reasons for their elimination.

8.2 Summary of Conclusions

The No Project Alternative and the Battery Energy Storage System Alternative would avoid or substantially lessen the impacts expected to occur under the Fountain Wind Project. Table 8-3 and Table 8-9 provide a summary comparison of the Fountain Wind Project environmental impacts and those of the No Project Alternative and the Battery Energy Storage System Alternative, respectively.

The Reduced Project Alternative would reduce the acreage of temporary and permanent disturbance by constructing fewer turbines than the proposed project. However, as shown in Table 8-6, the types of impacts that would occur from the construction and operation of the Reduced Project Alternative and the overall severity of the impacts would remain similar to the proposed project.

8.3 CEQA Requirements

CEQA requires that an EIR "consider a reasonable range of potentially feasible alternatives [to the project] that will foster informed decision making and public participation" (Cal. Code Regs., tit. 14, section 15126.6, subd. (a)). Section 15126.6 of the CEQA Guidelines provides that the alternatives analysis must include all the following:

- Description of a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project;
- Evaluation of the comparative merits of the alternatives;
- A focus on alternatives that would avoid or substantially lessen any significant effects of the project, even if these alternatives would impede to some degree attainment of the project objectives, or would be more costly; and
- Description of the rationale for selecting alternatives to be discussed and identification of alternatives that were initially considered but then rejected from further evaluation.

Alternatives may be eliminated from detailed consideration by the lead agency if they fail to meet most of the basic project objectives, are infeasible, or could not avoid any significant environmental effects of the proposed project (Cal. Code Regs., tit. 14, section 15126.6, subd. (c)). In addressing the feasibility of alternatives, factors typically considered are:

- Site suitability;

- Economic viability;
- Availability of infrastructure;
- General plan consistency and/or other plans or regulatory limitations;
- Jurisdictional boundaries; and
- Whether the project proponent can reasonably acquire, control, or otherwise have access to the alternative site (Cal. Code Regs., tit. 14, section 15126.6, subd. (f)(1)).

California Code of Regulations, title 20, section 1201(h) defines "feasibility" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

The issue of feasibility arises at two different junctures: (1) in the assessment of alternatives in the EIR, and (2) during the agency's later consideration of whether to approve the project. For the first phase (i.e., inclusion in the EIR) the standard is whether the alternative is potentially feasible. By contrast, at the second phase (i.e., the final decision on project approval) the decision-making body evaluates whether the alternatives are actually feasible. (See CEQA Guidelines section 15091(a)(3)). At that juncture, the decision makers may reject as infeasible alternatives that were identified in the EIR as potentially feasible (*California Native Plant Society v. City of Santa Cruz* (2009), 177 Cal. App. 4th 957).

The range of potentially feasible alternatives selected for analysis is governed by a "rule of reason," requiring the evaluation of only those alternatives "necessary to permit a reasoned choice" (Cal. Code Regs., tit. 14, section 15126.6, subd. (f)). Also, an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (Cal. Code Regs., tit. 14, section 15126.6, subd. (f)(3)).

The lead agency is also required to evaluate the impacts of the "No Project" alternative. Analyzing a "No Project" alternative allows decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project (Cal. Code Regs., tit. 14, section 15126.6, subd. (e)(1)). Section 15126.6 subd. (e)(2) of the CEQA Guidelines states:

> *The 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is published . . . as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives*.

8.3.1 Project Objectives

Section 15124(b) of the CEQA Guidelines addresses the requirement for an EIR to contain a statement of objectives, as follows:

> *A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project and may discuss the project benefits.*

Objectives Identified by the Applicant

The applicant filed its 2020 Fountain Wind Project EIR with the CEC as part of its project application, which identified the following project objectives (Shasta County 2020b):

Objective #1: Develop, construct, and operate a commercial wind energy generation facility capable of generating up to 216 MW[1] of wind energy.

Objective #2: Interconnect to the Northern California electrical grid (NP15).[2]

Objective #3: Locate the project in close proximity to an existing transmission line with sufficient capacity to reduce impacts and costs associated with building new transmission infrastructure.

Objective #4: Assist California in meeting the renewable energy generation targets set in Senate Bill (SB) 100.

Objective #5: Create temporary and permanent jobs in Shasta County and contribute to the County's tax base.

Objective #6: Obtain entitlements to construct and operate a commercially financeable wind energy project.

Objective #7: Support landowners through diversification of revenue streams.

Objective #8: Offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels.

Objective #9: Provide emissions-free energy for approximately 100,000 households.

In order to develop a reasonable range of alternatives that could potentially avoid the multiple significant unavoidable environmental impacts and LORS inconsistency while attaining most of the basic objectives of the project per CEQA Guidelines section 15126.6(a) (CEC 2023a), CEC staff requested an updated and clear statement of objectives from the applicant. Staff also requested clarification on how the capacity and

1 During the 2023 CEC Data Adequacy process, the applicant modified this target generation capacity to 205 MW to reflect the change in the number of proposed turbines (Stantec 2023a).

2 NP15 refers to the electric grid that is north of the Path 15 transmission line. Path 15 is an 84-mile north-south transmission line, and is part of the Western Power Coordinating Council's Power Interconnection Path links for the western U.S.

generation targets listed in the project objectives from the 2020 Draft EIR were identified by the applicant.

In its response to staff docketed on February 10, 2023 (TN 250551), the applicant re-stated the underlying purpose of the project as the following: "to develop a utility-scale wind energy facility capable of generating up to approximately 205 megawatts (MW) of renewable wind energy and to assist California in meeting renewable energy generation targets set forth in Senate Bill (SB) 100" (Stantec 2023a). The applicant further stated that capacity and generation targets were based on the available capacity within the existing PG&E transmission line (Stantec 2023a). The applicant explained that the goal of the project is "to develop a commercial wind energy generating facility in an area with viable wind resources (objectives 1 and 6), located in proximity to existing transmission facilities with available capacity (objectives 2 and 3), to assist the State of California in meeting its renewable energy goals and to offset carbon dioxide emissions (objectives 4, 8, and 9)" (Stantec 2023a).

Objectives Identified by the CEC

Given the applicant's confirmation that its goal is to construct a commercial wind energy generating facility and that the proposed location was selected based on viable wind resources and the available capacity of the adjacent transmission line (Stantec 2023a), staff has concluded that the applicant is a merchant generator who has selected the proposed location due to site availability within an area with adequate wind resources to support a commercial wind-energy facility. No information has been provided to staff to indicate that there is a specific need for additional generation within the transmission system to which the proposed project would connect (Stantec 2023a).

In order to develop a reasonable range of alternatives to evaluate CEQA requirements, address the LORS inconsistency, and to determine whether any alternatives reflect a more prudent and feasible means of achieving the public convenience and necessity in an override analysis, CEC staff has modified the applicant's list of objectives and added factors set forth in the Public Resources Code section 25525, to clarify that the following are the basic project objectives:

- Assist California in meeting renewable energy generation or zero carbon targets set forth in SB 100.
- Interconnect to the Northern California electrical grid with available capacity.

In addition, when evaluating whether an alternative is more prudent and feasible than the proposed project, the following categories of facts, identifed in Public Resources Code section 25525, must be considered for the proposed project and each alternative:

- The project's environmental impacts;
- The project's consumer benefits; and
- The project's impacts on grid reliability.

8.3.2 CEC Staff's Alternatives Screening Process

The CEQA Guidelines describe the selection of a reasonable range of alternatives and the requirement to include those that could feasibly accomplish most of the basic project objectives while avoiding or substantially lessening one or more of the significant effects (Cal. Code Regs., tit. 14, section 15126.6, subd. (c)). The CEQA Guidelines require the alternatives analysis to briefly describe the rationale for selecting alternatives to be discussed. The analysis also should identify any alternatives that were considered by the lead agency but were rejected as infeasible and briefly explain the reasons underlying the lead agency's determination.

The CEQA Guidelines list factors that may be considered when addressing feasibility of alternatives, including: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control, or otherwise have access to, the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives (Cal. Code Regs., tit. 14, section 15126.6, subd. (f)(1)).

Pursuant to CEQA, the purpose of staff's alternatives analysis is to focus on alternatives that are capable of avoiding or substantially reducing the potentially significant impacts of the proposed project, and be consistent with LORS, while still meeting most of the basic project objectives.

Staff used the methodology summarized below to prepare the analysis of alternatives.

- Identify the potential significant environmental impacts of the project.
- Describe the objectives of the proposed project.
- Identify and evaluate feasible alternatives that meet most of the basic project objectives, while avoiding and/or substantially lessening the project's signficant impacts and are consistent with LORS.
- Evaluate the comparative (to the proposed project) merits of the alternatives.

8.4 Public and Agency Participation

Staff, in determining the scope and content of this analysis, considered verbal and written scoping comments received to date from agencies, tribes, and the general public regarding alternatives to the proposed project. Preparation of the Fountain Wind Project alternatives analysis included staff's review of the following:

- Verbal and written comments provided during the CEC Joint Environmental Scoping and Informational Meeting held in Anderson, CA, on November 28, 2023 (CEC 2023d).
- Written comments added to the Fountain Wind Project Docket: 23-OPT-01 (CEC 2023d).

- Verbal and written comments provided during the Shasta County Fountain Wind Project scoping meeting held in Montgomery Creek, CA, on January 24, 2019, as summarized in the Fountain Wind Project Scoping Report (ESA 2019).
- Independent research and analysis of alternative technologies.

Applicable public and agency comments that pertain to the CEQA alternatives analysis are summarized in the two tables below as follows: Table 8-1 summarizes the comments provided during Shasta County's 2019 scoping period; and Table 8-2 summarizes the pre-scoping and scoping comments provided to the CEC during the Opt-in review process for the proposed project.

TABLE 8-1 COMMENTS RECEIVED ON ALTERNATIVES DEVELOPMENT AND ANALYSIS DURING SHASTA COUNTY'S 2019 SCOPING PERIOD

Issue	Comment Summary
No Project Alternative	During the 2019 scoping period, comments supporting the No Project Alternative were received from members of the local community, the Pit River tribe, and the Madesi Band-Pit River Tribe to avoid the project's anticipated environmental impacts to local residents. Comments in favor of the No Project Alternative stated that Shasta County already produces more power than it consumes. 2019 scoping comments also questioned the need for this project at the expense of local public health, safety, welfare, and convenience (ESA 2019).
Removing Turbines North of SR 299	During the 2019 scoping period, the Wintu Audubon Society and members of the public proposed a Reduced Project Alternative that involved either fewer turbines or a more concentrated placement of the existing turbines. The comments supporting this alternative emphasized that the proposed placement of turbines was more widespread than the Hatchet Ridge Wind Project, which may contribute to habitat fragmentation (ESA 2019).
Increased Setbacks	During the 2019 scoping period, residents of Moose Camp and the surrounding communities proposed relocating turbines a minimum distance of one mile from Moose Camp (ESA 2019).
Off-Site Alternative	During the 2019 scoping period, members of the public proposed alternative sites for wind farms, including offshore locations in Central California and onshore sites in several counties: Modoc, Tehama, Contra Costa (specifically Altamont Pass), Kern (Tehachapi Pass), and Riverside (San Gregorio Pass) (ESA 2019).
Repowering of Wind Facilities	During the 2019 scoping period, members of the public proposed repowering of existing wind facilities (e.g., Dillon, Tule Wind, Phoenix Wind, Manzana Wind, Mountain View III, and Shiloh) as an alternative to the proposed project (ESA 2019).
Alternative Technologies	During the 2019 scoping period, members of the public suggested alternative technologies to utility-scale wind energy, including solar power, cogeneration, and the expansion of hydroelectric generating capacity at existing facilities in Shasta County (ESA 2019).
Efficiency and Reduced Demand	During the 2019 scoping period, members of the public suggested strategies that focus on conserving energy, managing demand, and improving the efficiency of existing infrastructure for the storage and distribution of surplus electricity (ESA 2019).

TABLE 8-2 COMMENTS RECEIVED ON ALTERNATIVES DEVELOPMENT AND ANALYSIS DURING THE CEC'S OPT-IN REVIEW PROCESS

Issue	Comment Summary
No Project Alternative	During the 2023-2024 Opt-In review process, members of the local community, the Pit River Tribe, and Moose Camp reiterated the support for a No Project Alternative (TN 252295, TN 251997, TN 251922, TN 253405).
Removing Turbines North of SR 299	During the 2023-2024 Opt-In review process, the Wintu Audubon Society proposed alternatives that concentrate turbines over a more compact area and suggests forming a Technical Advisory Committee to advise on monitoring and adaptive management (TN 253510).
Increased Setbacks	During the 2023-2024 Opt-In review process, members of the public and Moose Camp proposed relocating turbines a minimum distance of one mile from Moose Camp (TN 250627), as well as increasing the setback from the Dogwood Acres LLC property (TN 253851).
Off-Site Alternative	During the 2023-2024 Opt-In review process, members of the public proposed alternative locations outside of Shasta County, such as offshore or along Highway 95 (TN 251858).
Repowering of Wind Facilities	During the 2023-2024 Opt-In review process, members of the public and Moose Camp proposed repowering existing turbines, constructing offshore wind farms, and improving transmission lines (TN 253343).
Alternative Technologies	During the 2023-2024 Opt-In review process, members of the public proposed alternative renewable energy sources such as biomass facilities with forest management (TN 253395, TN 253042, TN 252363). Comments received during the 2023 Environmental Scoping and Informational Meeting included suggestions to construct new hydroelectric facilities as an alternative (TN 254477). Members of the public also proposed exploring new technologies in nuclear power (TN 253149, TN 252923), while the Native Roots Network proposed a solar alternative (TN 253341).
Efficiency and Reduced Demand	During the 2023-2024 Opt-In review process, members of the public proposed the promotion of rooftop solar to reduce demand on the electrical grid (TN 253513).

Note: Comments submitted during the 2023-2024 Opt-In review process can be accessed through the Docket Log for the Fountain Wind Project (Docket: 23-OPT-01) (CEC 2023d).

8.5 Environmental Impacts of the Proposed Project

This EIR evaluates the environmental impacts of implementing the proposed project. One of the purposes of an alternatives analysis is to consider alternatives that would avoid or lessen the significant effects of a project which would also potentially support a finding that an alternative is more prudent and feasible then the proposed project. Significant effects from construction or operation of the Fountain Wind Project are summarized in **Section 1, Executive Summary, Table 1-1**, and are described in detail in each of the respective issue area analyses of this EIR. Staff has identified one or more significant environmental effects for the following issue areas:

- Air Quality (Section 5.1);
- Biological Resources (Section 5.2);

- Cultural and Tribal Cultural Resources (Section 5.4);
- Geology, Paleontology, and Minerals (Section 5.6);
- Hazards, Hazardous Materials, and Wildfire (Section 5.7);
- Land Use and Agriculture (Section 5.8);
- Noise and Vibration (Section 5.9);
- Transmission Line Safety and Nuisance (Section 5.13);
- Transportation (Section 5.14);
- Visual Resources (Section 5.15);
- Water Resources (Section 5.16); and
- Forestry Resources (Section 5.17).

Staff's recommended conditions of certification are presented in each issue area section along with the associated identified significant effects.

8.6 Alternatives Eliminated from Detailed Consideration

CEQA Guidelines section 15126.6(c) describes the selection of a reasonable range of alternatives and the requirement to include those that could feasibly accomplish most of the basic project objectives while avoiding or substantially lessening one or more of the significant effects. The analysis should identify any alternatives that were considered by the lead agency but were rejected as infeasible. CEQA requires a brief explanation of the reasons underlying the lead agency's determination to eliminate alternatives from detailed analysis.

The alternatives described in the subsections that follow were considered but eliminated from detailed consideration. Alternatives that were not carried forward for full analysis include an Alternative Site, Technology Alternatives (other than battery storage), Improving Energy Efficiency, and Repowering of Existing Facilities. The following provides staff's reasons for eliminating these alternatives from detailed analysis.

8.6.1 Alternative Site

Comments submitted during Shasta County's 2019 scoping period requested that the EIR consider an alternative site location within one of the following regions: Modoc County, Tehama County, Contra Costa County's Altamont Pass, Kern County's Tehachapi Pass, and Riverside County's San Gregorio Pass (ESA 2019). However, the 2020 Draft EIR for the Fountain Wind Project did not consider an off-site alternative. Text from the 2020 Draft EIR states,

> *Because the land use and planning provisions that govern use of the proposed site contemplate potential wind energy use (Shasta County Code of Ordinances section 17.08.030), the County has elected not to reconsider those determinations in the*

context of this EIR and instead is focusing on whether an environmentally superior version of the Project exists within the Project Site (Shasta County 2020b).

In its data adequacy request to the applicant docketed on February 10, 2023, CEC staff requested that the applicant provide information regarding a feasible alternative site for the development of a large wind energy system (outside of unincorporated Shasta County) that meets the basic project objectives (CEC 2023b). The applicant provided the following response to staff (TN 251462):

Alternative Site – 13,125 acres of private land in Tehama County – 48 turbines, 205 MW; a map is attached as Exhibit 1 [TN 251462]*; 4.25-mile gen-tie line; connecting to existing 230 kV PG&E transmission system via a tap of one of the four parallel lines listed below.*

- *Cottonwood to Cortina 230 kV*
- *Logan Creek to Cottonwood 230 kV*
- *Cottonwood to Vaca Dixon 230 kV*
- *Cottonwood to Glenn 230 kV*

Transmission upgrades required, at a minimum, would include a new interconnection switchyard as well as other Network Upgrades as identified by the Grid Operator (CAISO) through an interconnection request and associated study work. A similar number of new access roads and ground disturbance would be required for this off-site alternative as the proposed project. A project at the alternative site would meet most of the project objectives but would not be as desirable because development at the alternative site would likely require additional accommodation of environmental constraints compared to the proposed site (Stantec 2023d).

The applicant further stated that the Tehama County alternative site was identified through a desktop review of the region and has not considered landowner interest, design or construction feasibility, or environmental constraints (Stantec 2023d).

Feasibility. Staff has conducted further research on the alternative site to identify the potential for new impacts (e.g., zoning restrictions, proximity to sensitive receptors, agricultural resources, scenic highways, etc.). Staff determined that the site's current zoning designation (AG-1 and AG-2) allows for a wind power facility (i.e., utility scale wind facility), subject to a county-issued use permit (Tehama County 2024a and 2024b). Staff further determined that there are no state or county designated scenic highways near the site (Caltrans 2019, Tehama County 2024b). However, this site was eliminated from further consideration and will not be carried forward for analysis based on the factors listed below.

- The availability of the site for development is unknown.
- The feasiblity of connecting to the exisiting transmission grid is unknown.

- The extent to which sensitive biological or cultural resources are present within the alternative site is unknown. Therefore, it is not possible to reasonably assess whether use of the site would reduce the significant biological and cultural resources impacts of the proposed project.
- The alternative site would encompass areas of Important Farmland as designated by the California Department of Conservation, including designated Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance (DOC 2023a). Numerous parcels included within the alternative site are currently enrolled in a Williamson Act contract (DOC 2023b). As such, the alternative site may create a new impact to agricultural resources.
- The alternative site would not avoid impacts to sensitive receptors. The Rancho Tehama Community, which consists of residential development, public facilities, and an elementary school, would be adjacent to the alternative site.

8.6.2 Alternative Technologies

Hydropower

A number of hydroelectric facilities currently operate in Shasta County. There are seven large hydroelectric facilities (greater than 30 MW) located on the Pit River, while several small hydroelectric facilities are located along tributaries of the Pit River (CEC 2023h).

Feasibility. The applicant is proposing to construct and operate a merchant wind energy facility with the objective of generating up to 205 MW of renewable energy. While hydroelectric generation is considered a zero-carbon resource, a suitable location in Shasta County with the amount of water needed for up to 205 MW hydroelectric generation is currently unknown. Extensive studies would be required to identify such a new location and to engineer a suitable hydroelectric facility. Developing such an alternative would be considered speculative at this time, and therefore has been eliminated from further consideration.

Offshore Wind

Assembly Bill (AB) 525, which took effect January 1, 2022, requires the CEC, in coordination with federal, State, and local agencies; tribes; and a variety of stakeholders, to develop a strategic plan for offshore wind energy development in federal waters off the California coast (CEC 2023e). In a subsequent report to evaluate and quantify the maximum feasible capacity of offshore wind, the CEC adopted an offshore wind planning goal of between 2 and 5 GW by 2030 and 25 GW by 2045 (CEC 2022a).

Offshore wind is an attractive technology from a system planning perspective due to the associated generation potential profile that complements solar, with higher output in the evenings, when electricity demand is high and solar production is low. Offshore wind also complements solar seasonally and can provide more consistent output during winter months when solar production is lower (CEC 2021a). It is important to note that

the SB 100 study scenarios assume that offshore wind development would not replace available onshore wind capacity, but instead would supplement onshore renewable generation (CEC 2021a).

Offshore wind development in the California region will occur primarily in federal waters in the Outer Continental Shelf area. In late 2022, the U.S. Bureau of Ocean Energy Management (BOEM) held an auction for leases within two federally designated Wind Energy Areas (WEA) offshore of California. The Humboldt WEA is approximately 20 miles offshore from Eureka (Humboldt County), and the Morro Bay WEA is approximately 20 miles offshore from Cambria (San Luis Obispo County). BOEM awarded five leases within the two WEAs (CEC 2023e).

BOEM is the lead federal agency responsible for National Environmental Policy Act (NEPA) review and related permitting processes for offshore wind energy development. BOEM would coordinate the involvement of other federal agencies and conduct outreach to stakeholders. State of California agencies (e.g., California State Lands Commission, California Department of Fish & Wildlife, and possibly the CEC) would conduct CEQA reviews, related permitting processes, and outreach to stakeholders. The California Coastal Commission would be a key agency involved in both NEPA and CEQA processes (CEC 2023e).

Feasibility. The development of offshore wind is currently being pursued by the State to meet the SB 100 renewable energy goals. The CEC, in partnership with relevant federal, State, and local agencies, is developing a five-part strategic plan for offshore wind development that includes identification of port space and infrastructure, transmission planning, and a preliminary assessment of impacts and strategies to avoid those impacts. The Port of Humboldt and the Port of Long Beach have both announced projects for the construction of staging and integration facilities to support the deployment of offshore wind turbines to the Humboldt WEA and Morro Bay WEA. A demonstration project for floating offshore wind turbines has also been proposed offshore of Vandenberg Space Force Base. These projects are within various stages of planning and environmental review, and their development would occur independent of any decision by the CEC on the proposed Fountain Wind Project. Furthermore, offshore wind development does not eliminate the need for additional onshore renewable energy generation to support SB 100. Offshore wind would not present a feasible alternative to the proposed project.

Small Wind Energy System

In 2022, Shasta County passed Ordinance No. SCC 2022-04 that banned large wind energy systems while allowing for the development of small wind energy systems (Shasta County 2023a). A “small wind energy system” is defined in Section 17.88.035 of the Shasta County Code as a wind turbine, tower, and associated control or conversion electronics used to reduce the on-site consumption of utility electricity that would otherwise be obtained via the electric grid. The turbine tower must not exceed 65 feet

in height on a parcel less than five acres and must not exceed 80 feet in height on a parcel greater than five acres (Shasta County 2023a).

CEC staff issued a data adequacy request to the applicant (TN 248759) to provide an alternative that considers the development of multiple small wind energy systems in Shasta County, consistent with Shasta County's Ordinance No. SCC 2022-04, that could achieve the basic project objectives in lieu of one large wind energy project (CEC 2023b). In response to staff's data adequacy request, the applicant stated that the development of multiple small wind energy systems in Shasta County would not meet the applicant's goals for the project to generate electricity for off-site consumption (Stantec 2023d).

Feasibility. As discussed in subsection 8.3.1, CEC staff has narrowed the applicant's list of objectives in order to develop a reasonable range of alternatives to evaluate in this EIR. A small wind energy system that reduces on-site consumption of utility electricity would support the SB 100 goals of developing carbon-free electricity sources while reducing energy demand on the electric grid. However, development of small wind energy systems would be a type of distributed generation that would be developed by individual property owners for on-site electricity consumption. Developing a small wind energy system does not serve as a feasible alternative to a utility-scale generation project with an objective of supporting state renewable or zero carbon energy targets by exporting energy derived from renewable resources to the grid, as opposed to primarily offsetting residential use with independent installations. Also, small wind systems designed to offset residential usage typically operate under a net metering program at the distribution level, while utility scale projects have a different transactional and payment rate impacting the feasibility of a project comprised of many separate small-scale systems.

Solar

Development of solar photovoltaic systems has been identified in the 2021 SB 100 Joint Agency Report as a key factor in meeting California's 2045 renewable energy generation targets (CEC 2021a). In its review of capacity expansion modeling, the SB 100 Joint Agencies determined that a minimum of 70 GW of new utility-scale solar would need to be added to the State's energy portfolio (CEC 2021a).

To identify potential areas containing renewable resource technical potential such as solar, the CEC partnered with the California Public Utilities Commission (CPUC) and CAISO to utilize map-based footprints (i.e., land-use screens) that delineate important environmental and physical characteristics of the land (e.g., biodiversity, habitat, and agricultural datasets) (CEC 2023f). These land-use screens highlight land access limitations or competing land-use priorities to help system planners focus on areas that have a greater potential for successful deployment of new utility-scale renewable energy capacity (CEC 2023f).

Per the 2023 land-use screen updates, large portions of the proposed project site are within the solar base exclusion layer, which excludes an area based on technical or economic criteria as well as conflicts with State or federal law, policy, or regulation (CEC 2023f and 2023g).

Feasibility

Utility-scale solar would be pursued by the State to meet the SB 100 renewable energy goals independent of any decision by the CEC on the proposed project. As indicated in the 2023 land-use screen updates, the proposed project site has not been identified as a suitable location for utility-scale solar (CEC 2023g), and a proposed solar development would not be a feasible alternative to the proposed project.

8.6.3 Improving Energy Efficiency

An alternative to meeting California's electricity demand with new generation is to reduce the demand for electricity. Such "demand side" measures include programs that increase energy efficiency, reduce electricity use, or shift electricity use away from "peak" hours of demand. The CEC adopted the nation's first energy conservation standards for buildings and appliances in the 1970s (CEC 2021a). These standards continue to be updated approximately every three years to reflect advances in energy-efficient technology (CEC 2021a).

Improvements to energy efficiency were identified as a priority in the 2021 SB 100 Joint Agency Report. The SB 100 Joint Agency Report pointed to a 2003 Energy Action Plan loading order policy, which states that energy needs should be met by energy efficiency and demand response first, followed by renewable energy and distributed generation (CEC 2018).

Feasibility

Energy efficiency programs will continue to be pursued by the State independent of any decision on the proposed project. An energy efficiency program or improved efficiency standards would not be a feasible alternative to a utility-scale wind project, although the long-term success of such efforts could eventually reduce the need for the development of new energy generation projects.

8.6.4 Repowering of Existing Wind Power Facilities

During the 2019 Shasta County Fountain Wind Project scoping meeting, members of the public proposed an alternative to repower existing wind facilities (ESA 2019). The following wind facilities were identified for consideration as a repowering alternative (Shasta County 2020b):

- Dillon Wind- 45 MW facility located in the San Gorgonio Pass (Riverside County and the City of Palm Springs)
- Phoenix Wind- 2.1 MW facility located in Riverside County
- Mountain View III- 22.4 MW facility located in Riverside County

- Tule Wind- 131 MW facility located in San Diego County
- Manzana Wind- 189 MW facility located in Kern County
- Shiloh Wind- 505 MW facility located in Solano County

Feasibility

This alternative was not considered in detail because the applicant does not own or control these wind energy sites (Shasta County 2020b). Repowering of existing wind facilities is a feasible strategy to increase the power output of a facility while often reducing the number of existing turbines. Examples include:

- The Gonzaga Ridge Wind Farm is converting from a 16.5 MW facility with 162 turbines to a 100 MW faciltiy with only 40 turbines (CDPR 2019).
- The Sacramento Municipal Utility Districst's Solano Wind Project 4 is replacing 23 turbines (0.66 MW each) with 19 new turbines (4.5 MW each), which will increase the overall facility capacity by 70 MW (SMUD 2023).
- The Summit Wind Repower Project in Altamont Pass replaced 569 turbines (100 kW each) with 23 new turbines (2.5 MW each), which resulted in approximately the same generating capacity of 57 MW (Jacobs 2020; Sargent & Lundy 2024).

While repowering is a feasible statewide strategy to modernize aging renewable generation and increase the overall megawatt hours of generation for the state, and potentially reduce the overall project size, the decision to repower any existing wind energy facility will be determined by the owner of that facility. Staff conducted desktop research of the prior listed facilities and determined that there is no indication that an owner has plans to repower any of these sites. Repowering one of the sites identified above would not present a feasible alternative to the proposed project to the extent that the applicant has no control over such a project.

8.7 Alternatives Evaluated in Full Detail

The following alternatives were selected for full evaluation in this EIR:

- Alternative 1: No Project/No Build Alternative
- Alternative 2: Reduced Project Alternative
- Alternative 3: Battery Energy Storage System Alternative

The No Project/No Build Alternative is required for analysis for every project according to CEQA Guidelines section 15126.6(e). The alternatives evaluated in full listed above appear more feasible than the dismissed alternatives (discussed earlier) that could avoid or reduce the proposed project's potentially significant impacts. The following analysis includes a comparative analysis of the impacts of each alternative, as well as an assessment of each alternative's feasibility and ability to meet the project objectives. The comparative analysis is centered on the impacts addressed in this Staff

Assessment. Tables 8-3, 8-6, and 8-9 compare the proposed project's impacts for each issue area to those of each alternative.

8.7.1 No Project Alternative

Overview

CEQA Guidelines section 15126.6(e) requires that a no project alternative be evaluated in an EIR. The purpose of analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project against the impacts of not approving the project. Toward that end, the "no project" analysis considers "existing conditions at the time the notice of preparation is published" and "what would be reasonably expected to occur in the foreseeable future if the project were not approved…" (CEQA Guidelines section 15126.6(e)(2)). CEQA Guidelines section 15126.6(e)(3) explains that the selected approach to the "no project" alternative discussion depends on the type of project that is proposed, namely, whether the project is a revision to an existing plan or ongoing operation, or whether the project would be a new activity or development of an identifiable property. As the proposed project would construct and operate a new wind energy facility, per CEQA Guidelines section 15126.6(e)(3)(B), the "no project" alternative would address "…[t]he environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved." The no project scenario must also consider the foreseeable actions that may occur following disapproval of the proposed project (CEQA Guidelines section 15126.6(e)(3)(B)).

Description

Under the No Project Alternative, the proposed development of a wind energy facility at the project site would not occur. None of the proposed wind turbines would be installed and none of the associated infrastructure and ancillary facilities would be constructed, including the proposed electrical collection system, substation, switching station, O&M facility, meteorological towers, and communication lines. Proposed road construction and improvements would not occur. Temporary facilities needed for construction would not be implemented, including laydown areas, storage sheds, and batch plants. Current conditions at the site would continue into the foreseeable future.

As there are currently no other known proposals for the future use of the project site, it is likely that the land within the project site would continue to be managed for timber production for the foreseeable future. The current Shasta County General Plan designation for the site is Timber (T), and the current zoning designation is Timber Production (TP) (Shasta County 2023b).

Existing energy generation sources in the surrounding project area would continue to operate under the No Project Alternative. These generation sources include Hatchet Ridge Wind (101 MW), Burney Forest Power co-generation facility (30 MW), and hydroelectric facilities (ranging from 2 MW to 172 MW) located along the Pit River and

its tributaries. A proposed 3 MW co-generation plant north of Burney is anticipated to be online in 2024 (Arthur 2023).

While required for analysis under CEQA, the No Project Alternative would not meet the requirements of the CEQA Guidelines as being an alternative to the Fountain Wind Project "...which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (Cal. Code Regs., tit. 14, section 15126.6, subd. (a)). The proposed project is intended to develop in-state wind energy within the Northern California electrical grid. The No Project Alternative would not meet the two basic project objectives identified by staff:

- Assist California in meeting renewable energy generation targets set forth in SB 100.
- Interconnect renewable generation to the Northern California electrical grid.

Environmental Analysis

Air Quality

Under the No Project Alternative, construction and operation of the proposed project would not occur. The No Project Alternative would avoid the proposed project's construction-related air emissions due to fugitive dust and exhaust from heavy duty construction equipment and operational emissions including those from occasional use of the emergency generator. There would be no new sources of criteria air pollutants, and no impacts to air quality.

Biological Resources

Under the No Project Alternative, the project site would continue to be managed for timber production and would maintain its current designation as "Timberlands." Subsequently, any conversion or modifications to sensitive habitats, including riparian features would continue to occur at current levels. Under the No Project Alternative, no construction activities or structures would be introduced to the project area that increase the risk of wildlife collisions or uncontrollable wildfires.

As defined by Policy FW-b, Section 6.7 (Fish and Wildlife Habitat Element) of the Shasta County General Plan, the "Timberlands" designation, in most cases, protects habitat resources. Biological resources, including sensitive habitats and special-status plants and wildlife, would continue to be subject to effects of existing timber harvesting activities. Therefore, impacts to biological resource would be less than significant.

Any impacts associated with ongoing timber operations would be regulated by existing plans and permits. Therefore, the No Project Alternative would avoid conflicts with any local, regional, or state plans, policies, or ordinances.

Climate Change and Greenhouse Gas Emissions

Under the No Project Alternative, the proposed development of a wind energy facility would not occur at the project site. Short-term construction greenhouse gas (GHG) emissions would be avoided. No electricity would be generated at the project site. Compared with the proposed project, which would result in a net GHG reduction by producing electricity from renewable energy, no change in GHG emissions would occur. GHG emissions from fossil-fuel power plants providing power to the electricity grid would continue as in the existing conditions.

Cultural and Tribal Cultural Resources

Under the No Project Alternative, construction and operation of the proposed project would not occur. This alternative would avoid potential construction and operation impacts to both cultural and tribal cultural resources within the project site and surrounding viewshed.

Efficiency and Energy Resources

Under the No Project Alternative, ongoing timber harvesting activities at the project site would consume fuel at a level similar to operations and maintenance of the proposed wind energy facility, which would create a less than significant impact to the consumption of energy resources. However, there would be no construction phase under the No Project Alternative that would require substantial earth moving equipment and consumption of fossil fuels over a 28-month period. The No Project Alternative would have no construction-related impact associated with the consumption of energy resources.

Forestry Resources

The No Project Alternative assumes that the project site would continue to be managed for timber production, and high and intermediate quality timberland (i.e., Site Class I and Site Class II) would not be converted to non-timber use. Future timber harvesting activities under this alternative would be compatible with the site's zoning for Timberland Production (i.e., TPZ or TP district). No impacts to Forestry Resources would occur as a result of the No Project Alternative.

Geology, Paleontology, and Minerals

The project site is underlain by Pliocene and Pleistocene-age andesitic, basaltic, and pyroclastic volcanic rocks that have low to no potential to contain paleontological resources. Likewise, the project site is not located within zones that are identified as containing significant mineral deposits. As the project site would continue to be managed for timber production under the No Project Alternative, which would not require permanent structures, geologic hazards would not need to be evaluated for building safety. Continued use of the project area for timber production would have little to no impact on paleontological, mineral or geologic resources.

Hazards, Hazardous Materials, and Wildfire

Without the proposed project, there would be no use of hazardous materials for project construction or operation for a wind energy facility. Additionally, there would be no hazards introduced at the project site that would affect aviation safety, emergency response plans or evacuation routes. Small quantities of hazardous materials, such as fuels for equipment, would likely be used on site during timber harvesting activities. These hazardous materials would not be stored onsite, resulting in a less than significant impact from hazardous materials.

The project site is located in a mapped high fire hazard zone and timber harvesting activities would continue to pose a risk of triggering a wildfire. There would not be any structures constructed. Harvesting activities would occur under existing plans, permits and fire prevention plans under the No Project Alternative. Additionally, under the No Project Alternative no construction activities or facilities would be introduced at the project site that would increase the risk of hazards from wildfires. Under the No Project Alternative impacts related to hazardous materials and wildfire would be less than significant.

Land Use and Agriculture

The No Project Alternative assumes that the project site would continue to be managed for timber production. Current use of the project site for timber harvesting is consistent with the County's intended use for the site, as expressed through the site's land use and zoning designation. The No Project Alternative would avoid any conflict with local land use plans, policies, or zoning regulations applicable to the project site.

Ongoing timber harvesting activities would not contribute to the conversion of Farmland or conflict with lands enrolled in a Williamson Act contract for the foreseeable future. The area of DOC-designated Farmland nearest to the project area (i.e., 28 acres of Prime Farmland) is actively used for agricultural operations as a cattle ranch (see **Section 5.8, Land Use and Agriculture**). The parcels within the project area that are owned by Oxbow Timber I, LLC are not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance Farmland, nor are they enrolled in a Williamson Act contract. Continued use of the project area for timber production would not impact Farmland or a Williamson Act contract.

Noise and Vibration

Under the No Project Alternative, construction and operation of the proposed project would not occur. This alternative would avoid potential construction and operation noise impacts at sensitive receptor sites, such as residences that are nearest to the proposed wind turbines.

Public Health

Under the No Project Alternative, construction and operation of the proposed project would not occur. Without the proposed development of a wind energy facility at the

project site, new sources of toxic air pollutants during construction and operation would be avoided, and the No Project Alternative would avoid creating health risks from toxic air pollutants. There would be no impacts to public health.

Socioeconomics

Ongoing use of the project site for timber harvesting under the No Project Alternative would not induce unplanned population growth or displace people or housing. Furthermore, current timber use would not include construction of new or physically altered governmental facilities and would not impact the public services in Shasta County, including fire and police protection, schools, parks and recreational facilities, or other public facilities.

Solid Waste Management

Under the No Project Alternative, the project site would continue to be managed for timber production. Presumably, timber harvesting would produce a minimal amount of trash at a level similar to the operational phase of the proposed project, which would have a less than significant effect on the capacity of solid waste facilities. However, the No Project Alternative would avoid the generation of up to 480 tons of solid waste that would be expected during construction of the proposed wind energy facility. There would be no impact to the capacity of local infrastructure from construction-related waste under the No Project Alternative.

Transmission Line Safety and Nuisance

Under the No Project Alternative, the proposed project would have no construction and operation. Therefore, no Electric Field or Electro Magnetic Field would occur beneath the transmission or distribution collector facilities. Thus, there would be no impacts associated with Transmission Line Safety and Nuisance.

Transportation

Under the No Project Alternative, the proposed development of a wind energy facility would not occur at the project site. Short-term construction activities would not occur, such as moving workers and construction material to the site. The proposed project access intersections would not be constructed, and the associated measures to make the project access intersections compliant with Caltrans design standards would not be required. Long-term maintenance and operation would not be needed. Any VMT associated with site operations would be limited to ongoing timber harvesting activities, while the generation of new VMT specific to construction, operations, and maintenance of a wind energy facility would not occur.

Visual Resources

The No Project Alternative assumes that the project site would continue to be managed for timber production, which would not include construction of new, visually prominent structures or a visually prominent access road with the associated tree removal and vegetation clearance. As a result, the proposed project's significant, adverse impacts on

landscape integrity and visual quality, as experienced along the SR-299 highway corridor, and particularly in the vicinity of Hatchet Pass, would be avoided. The No Project Alternative would also avoid the significant, adverse impacts on existing landscape integrity and visual quality that would be caused by the introduction of visually prominent to dominant energy infrastructure to views from several dispersed individual residences and residential enclaves in the vicinity of the project and in the Montgomery Creek area (primarily west and north of SR-299). Furthermore, the No Project Alternative would not create a new source of night lighting, thereby avoiding the need to mitigate impacts associated with the proposed Project's turbine hazard safety lighting. No impacts to visual resources would occur under the No Project Alternative.

Water Resources

With respect to stormwater management, timber harvesting activities under the No Project Alternative would have a similar impact as the proposed project's construction phase. Best management practices (BMPs) would be employed along access roads, and stream crossings would necessitate compliance with Clean Water Act sections 404 and 405. However, timber harvesting would demand less water than construction of the proposed project due to the project's use of cement batch plants. In addition, timber harvesting would neither pump groundwater, nor would it need to construct and use an on-site septic system as proposed during project operations. The No Project Alterantive's continued use of the project area for timber production would have a less than significant impact on water resources, and would require less water consumption than the proposed project.

LORS Consistency

The current Shasta County General Plan designation for the site is Timber (T), and the current zoning designation is Timber Production (TP). Under the No Project Alternative, continued management of the project site for timber production would be consistent with the County's LORS, specifically Shasta County Municipal Code sections 17.88.035, 17.88.100, and 17.88.335 prohibiting a large wind energy system within an unincorporated area of Shasta County.

Summary Comparison

Table 8-3 provides a summary comparison of the Fountain Wind Project environmental impacts and those of the No Project Alternative. Based upon staff's analysis, the No Project Alternative would either avoid the impacts of the proposed project or would create impacts that are less severe than those of the proposed project.

TABLE 8-3 COMPARISON OF FOUNTAIN WIND PROJECT AND NO PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	No Project Alternative
Air Quality		
Conflict with or obstruct implementation of the applicable air quality plan	PSM	None

TABLE 8-3 COMPARISON OF FOUNTAIN WIND PROJECT AND NO PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	No Project Alternative
Result in a cumulatively considerable net increase of any criteria pollutant	PSM	None
Expose sensitive receptors to substantial pollutant concentrations	PSM	None
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	LS	None
Biological Resources		
Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	SU	LTS
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 Wildlife or U.S. Fish and Wildlife Service	SU	LTS
Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means	SM	LTS
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 wildlife nursery sites	SU	LTS
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	SU	None
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan	None	None
Climate Change and Greenhouse Gas Emissions		
Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment	LS	None
Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions	LS	None
Cultural and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of a historical resource	SU	None
Cause a substantial adverse change in the significance of a unique archaeological resource	PSM	None
Disturb human remains	PSM	None
Cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in California Register of Historical Resources, or in a local register	None	None

TABLE 8-3 COMPARISON OF FOUNTAIN WIND PROJECT AND NO PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	No Project Alternative
Cause a substantial adverse change in the significance of a tribal cultural resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant	SU	None
Efficiency and Energy Resources		
Impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation	LS	None
Conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	None
Forestry Resources		
Conflict with zoning for forest land or timberland	SU	None
Conversion of forest land	SU	None
Create other changes in the environment that contribute to loss of forest land	SM	None
Geology, Paleontology, and Minerals		
Increase the risk of loss, injury, or death due to geologic hazard	LS	None
Destroy a unique paleontological resource or geologic feature	LS	None
Result in the loss of an available mineral resource	LS	None
Hazards, Hazardous Materials, and Wildfire		
Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	SM	LS
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	SM	LS
Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	None	None
Be 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 or excessive noise for people residing or working in the project area	SM	None
Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	LS	None
Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires	SM	LS
Substantially impair an adopted emergency response plan or emergency evacuation plan in a very high fire hazard severity zones	PSU	None
Exacerbate wildfire risks and expose project occupants and the public in nearby communities to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire	SM	LS
Project infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or may result in temporary or ongoing impacts to the environment	SM	None

TABLE 8-3 COMPARISON OF FOUNTAIN WIND PROJECT AND NO PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	No Project Alternative
Expose people or structures to downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes	SM	LS
Land Use and Agriculture		
Create a conflict with an established land use	LS	None
Conflict with local land use plans, policies, or regulations	SU	None
Conflict with agricultural zoning	SU	None
Noise and Vibration		
Generation of a substantial increase in ambient noise levels	PSM	None
Generation of excessive groundborne vibration levels	LS	None
Public Health		
Expose sensitive receptors to substantial pollutant concentrations or result in other public health impact	LS	None
Socioeconomics		
Induce unplanned population growth or displace people or housing	LS	None
Impact the public services in Shasta County, including fire and police protection, schools, parks and recreational facilities or other public facilities	LS	None
Solid Waste Management		
Generate solid waste in excess of the capacity of local infrastructure	LS	None
Transmission Line Safety and Nuisance		
Electric Field and Electro Magnetic Field	LS	None
Transportation		
Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities	LS	None
Conflict or be inconsistent with CEQA Guidelines, section 15064.3, subdivision (b)	LS	None
Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	PSM	None
Result in inadequate emergency access	LS	None
Visual Resources		
Substantially degrade landscape integrity and visual quality	SU	None
Create a new source of night lighting	SM	None
Water Resources		
Violate water quality standards or waste discharge requirements	PSM	PSM
Decrease groundwater supplies	PSM	None
Substantially alter the existing drainage pattern of the site	PSM/LS	PSM/LS
Have sufficient water supplies	PSM	None

TABLE 8-3 COMPARISON OF FOUNTAIN WIND PROJECT AND NO PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	No Project Alternative
On-site waste-water treatment	PSM	None
LORS Consistency	Inconsistent	Consistent

Notes:
The following impact conclusions correspond to impact determinations of the Fountain Wind Project, as provided within each environmental analysis section of this EIR:
None = No impact
Beneficial = Beneficial impact
Unknown = Significance of impact is unknown
LS = Less than significant impact, no mitigation required
SM or PSM = Significant/Potentially significant impact that can be mitigated to less than significant
SU or PSU = Significant/Unavoidable or Potentially significant/Unavoidable impact that cannot be mitigated to less than significant

8.7.2 Reduced Project Alternative

Overview

After extensive review of alternatives information presented by the applicant in the 2020 EIR and during the data adequacy process for the application before the CEC, and after consideration of other alternatives that were described and eliminated from further analysis in subsection 8.6, staff has determined that a Reduced Project Alternative is a feasible option of reducing the proposed project's potentially significant impacts while meeting the following basic project objectives identified by staff:

- Assist California in meeting renewable energy generation or zero carbon targets set forth in SB 100.
- Interconnect to the Northern California electrical grid with available capacity.

In addition, when evaluating whether an alternative is more prudent and feasible than the proposed project, the following categories identifed in Public Resources Code section 25525 are considered for the proposed project and alternative:

- The environmental impacts;
- The consumer benefits; and
- The impacts on grid reliability.

In an effort to evaluate an alternative that "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (Cal. Code Regs., tit. 14, section 15126.6, subd. (a)), CEC staff has developed a Reduced Project Alternative.

Staff identified 26 turbines that contribute to specific potentially significant visual, forestry, and/or biological impacts that could be eliminated under this alternative. Table 8-4 lists the turbines that would be eliminated under the Reduced Project Alternative.

TABLE 8-4 TURBINES ELIMINATED UNDER THE REDUCED PROJECT ALTERNATIVE

Turbine No.		Reason for Elimination
B02	C04	Staff determined that the following 12 turbines contribute to a significant visual resource impact: turbines B02-B05, C02-C08, and F1. This impact is documented in the simulations presented for KOP 4 (Visual Resources Figures 12 and 14) and KOP 5 (Visual Resources Figures 15 and 16), which are located on westbound SR 299. All 12 turbines are highly visible from various locations along westbound SR 299 at distances ranging from 0.5 miles to 2.0 miles. Omitting all 12 turbines would be necessary to avoid this significant visual resource impact.
B03	C05	
B04	C06	
B05	C07	
C02	C08	
C03	F01	
F03	L06	Staff determined that the following 6 turbines contribute to a significant forestry resource impact: turbines F03, K06, K07, L06, M06, and M07. All 6 turbines would remove and convert natural stands of timber. A natural stand refers to a stand of trees grown from natural seed fall or sprouting. Omitting these 6 turbines would be necessary to reduce this significant impact from timber conversion.
K06	M06	
K07	M07	
J01	L09	Staff determined that 8 turbines contribute to a significant biological resource impact. Four of these turbines (J01, J02, L08, L09) are located along the periphery of Lassen National Forest and would pose a particular risk to birds and bats as they utilize the Pacific flyway migratory corridor. The remaining 4 turbines (L07, M08, M09, M10) are located adjacent to and/or would require numerous crossings of wetlands. Omitting these 8 turbines would be necessary to reduce this significant biological resource impact.
J02	M08	
L07	M09	
L08	M10	

Sources: Jefferson Resource Company 2023; Stantec 2023e; USFWS 2023

Staff recognizes that the significant effects identified for visual, forestry, and/or biological resources are generally attributed to different sets of turbines for each of these resources. For example, the majority of the turbines located north of the 230-kV transmission line corridor (B02-B05, C02-C08, F01-F02, E01-E05) would not affect natural timber stands and would cross over fewer streams/wetlands than the turbines south of the transmission line corridor (Jefferson Resource Company 2023; Stantec 2023e; USFWS 2023). South of the 230-kV transmission line corridor, there are more extensive natural timber stands and riparian areas. However, the proposed wind turbines located along the ridges nearest to SR 299 (north of the 230-kV transmission line corridor) would contribute to the greatest visual resource impacts. The turbines identified for elimination under the Reduced Project Alternative were selected by staff in an effort to reduce the significant and unavoidable impacts for the Fountain Wind Project to the degree feasible.

Assist California in meeting renewable energy generation or zero carbon targets set forth in SB 100. A Reduced Project Alternative would achieve the project objective of assisting California in meeting renewable energy generation or zero carbon targets set forth in SB 100, although to a lesser extent than the proposed project. The proposed project would provide a potential net offset of 210,806 MT CO2e per year (see **Section 5.3, Climate Change and Greenhouse Gas Emissions**). As the Reduced Project Alternative would eliminate 54% of the proposed turbines, this alternative would provide a potential net offset of 96,971 MT CO2e per year.

Interconnect to the Northern California electrical grid with available capacity. Interconnection to the electrical grid under the Reduced Project Alternative would be feasible given that the design and location of the wind turbines and the proposed project substation would not change substantially from the proposed project.

LORS Consistency. While this reduced alternative may reduce or avoid the project's significant unavoidable impacts, the reduced alternative would still be inconsistent with the County's LORS, specifically the prohibition of large wind facilities in unincorporated areas of Shasta County and the designation of the project site as a timber production zones reserved for timber harvesting. Therefore, this alternative would require the CEC make findings as set forth in Public Resources Code section 25525.

Description

The following is a description of the Reduced Project Alternative, which has been developed to avoid or substantially lessen significant effects of the proposed project per CEQA requirements. The Reduced Project Alternative incorporates input from visual, forestry, and/or biological resource technical staff and from the data gathered during their project site visits, as well as data obtained from geospatial analysis and desktop research conducted by alternatives and land use technical staff.

The Reduced Project Alternative would construct 22 wind turbines with the same nameplate capacity as the proposed project (i.e., up to 7.2 MW per turbine) and same turbine heights. A figure of the Reduced Project Alternative is presented in Figure 8-1, which illustrates the project layout and configuration at the site for the Reduced Project Alternative. Table 8-5 provides information on the components and estimated disturbance acreages for the Reduced Project Alternative in comparison to the proposed project.

TABLE 8-5 COMPARISON OF PROPOSED PROJECT AND REDUCED PROJECT COMPONENTS AND DISTURBANCE AREAS

Component	Proposed Project Quantity/Acreage of Disturbance	Reduced Project Quantity/Acreage of Disturbance
Turbines	Up to 48 turbines • Temporary disturbance = 240 acres (5 acres each) • Permanent disturbance = 120 acres (2.5 acres each)	Up to 22 turbines • Temporary disturbance = 110 acres (5 acres each) • Permanent disturbance = 55 acres (2.5 acres each)
Access Roads	Up to 38 miles • Temporary disturbance = 921 acres (assumes 200-ft. wide clearance) • Permanent disturbance = 184 acres (assumes 40-ft. wide clearance)	Up to 27 miles • Temporary disturbance = 655 acres (assumes 200-ft. wide clearance) • Permanent disturbance = 131 acres (assumes 40-ft. wide clearance)
Batch Plant	3 Batch Plants • Temporary disturbance = 15 acres (5 acres each)	3 Batch Plants • Temporary disturbance = 15 acres (5 acres each)
O&M Building	1 O&M Building • Permanent disturbance = 5 acres	1 O&M Building • Permanent disturbance = 5 acres

TABLE 8-5 COMPARISON OF PROPOSED PROJECT AND REDUCED PROJECT COMPONENTS AND DISTURBANCE AREAS

Component	Proposed Project Quantity/Acreage of Disturbance	Reduced Project Quantity/Acreage of Disturbance
Staging Areas	9 Staging Areas • Temporary disturbance = 18 acres (2 acres each)	5 Staging Areas • Temporary disturbance = 10 acres (2 acres each)
MET Tower	3 MET Towers • Temporary disturbance = 4.5 acres (1.5 acres each) • Permanent disturbance = 2.25 acres (0.75 acres each)	3 MET Towers • Temporary disturbance = 4.5 acres (1.5 acres each) • Permanent disturbance = 2.25 acres (0.75 acres each)
Underground Collector	Up to 39 miles • Temporary disturbance = 236 acres (assumes 50-ft. wide clearance) • Permanent disturbance = 142 acres (assumes 30-ft. wide clearance)	Up to 27 miles • Temporary disturbance = 164 acres (assumes 50-ft. wide clearance) • Permanent disturbance = 98 acres (assumes 30-ft. wide clearance)
Overhead Collector	Up to 6 miles • Temporary disturbance = 73 acres (assumes 100-ft. wide clearance) • Permanent disturbance = 58 acres (assumes 80-ft. wide clearance)	Up to 6 miles • Temporary disturbance = 73 acres (assumes 100-ft. wide clearance) Permanent disturbance = 58 acres (assumes 80-ft. wide clearance)
Substation	1 Substation • Temporary disturbance = 7 acres • Permanent disturbance = 5 acres	1 Substation • Temporary disturbance = 7 acres • Permanent disturbance = 5 acres
Switching Station	1 Switching Station • Temporary disturbance = 12 acres • Permanent disturbance = 8 acres	1 Switching Station • Temporary disturbance = 12 acres • Permanent disturbance = 8 acres
Microwave Tower	1 Microwave Tower • Temporary and permanent disturbance calculations are included in the substation acreages	1 Microwave Tower • Temporary and permanent disturbance calculations are included in the substation acreages
Storage Shed	2 Storage Sheds • Temporary and permanent disturbance calculations are included in the turbine, MET tower, or access road acreages	2 Storage Sheds • Temporary and permanent disturbance calculations are included in the turbine, MET tower, or access road acreages

Notes:
Assumptions for the proposed project components are derived from the applicant's revised Project Description Table 2 (FWPA, TN 251663).

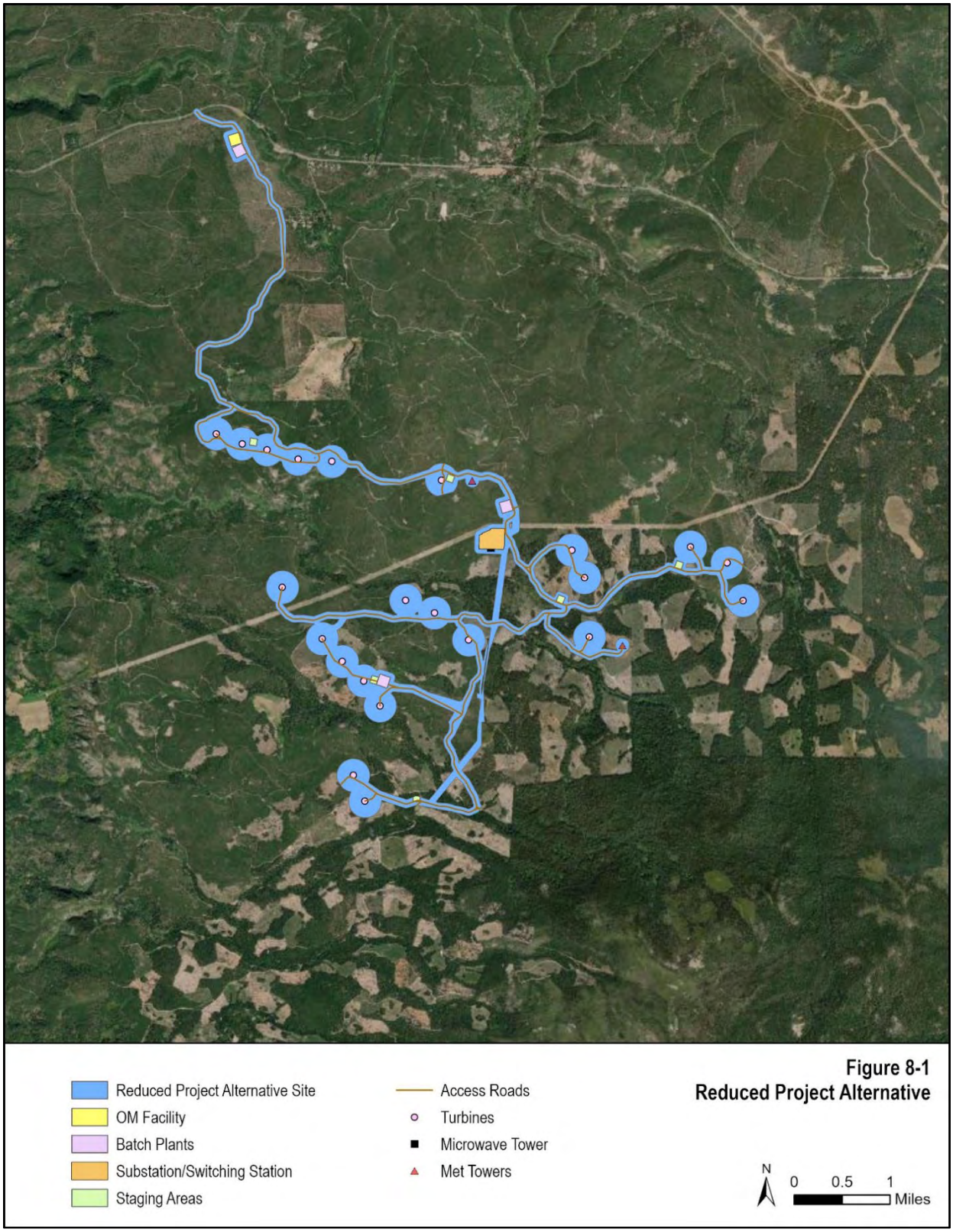


Figure 8-1
Reduced Project Alternative

Environmental Analysis

Air Quality

With the Reduced Project Alternative, the impacts to air quality would be similar to those of the proposed project. The Reduced Project Alternative would reduce the quantities of construction-related air emissions due to fugitive dust and exhaust from heavy duty construction equipment due to the reduced duration of construction activities and smaller construction footprint when compared with the proposed project. The air quality impacts during operation and maintenance of this alternative, which would include an emergency generator, would be similar to those of the proposed project. With the Reduced Project Alternative, the air quality impacts would continue to be less than significant with mitigation incorporated.

Biological Resources

While the elimination of the four turbines nearest to the Lassen National Forest would reduce impacts to birds and bats, adverse impacts to sensitive biological resources would still occur under this alternative. To avoid or minimize impacts to the degree feasible, the California Department of Fish and Wildlife (CDFW) has submitted the following recommendations in its comments on the Notice of Preparation (TN 253469) (CDFW 2023):

- A detailed micro-siting report, including the analysis of the latest micro-siting science and field studies based on the topography of the proposed project area.
- Specific protection plans for birds, bats, and other impacted species.
- A post-construction monitoring plan, specific to the proposed project and its activities.
- Adaptive management plans for birds, bats, and other impacted species that provide maximum targets for species fatalities.
- A maintenance plan, including a thorough discussion of all potential environmental impacts associated with maintaining the proposed project.
- A decommissioning plan, including thorough discussion of all potential environmental impacts associated with decommissioning and site remediation.

Direct and indirect construction impacts would be similar in type but slightly decreased in magnitude under the Reduced Project Alternative because vegetation clearing and ground disturbing activities would not occur at the eliminated turbine sites. With the implementation of the same staff proposed COCs developed for the proposed project, construction impacts would be less than significant under this alternative.

Eight specific turbines were selected for elimination due to their proximity to the Lassen National Forest, the Pacific Flyway migratory corridor, and/or wetland crossings. This would provide a larger buffer between the remaining proposed wind turbines and intact stands of established forested habitats that support resident and migratory bird and bat

species, thus reducing the risk associated with operational impacts from collisions with project structures. However, mortalities, including those of threatened and/or endangered species such as sandhill crane and California spotted owl, from collisions would still likely occur.

Although several towers would be eliminated under the Reduced Project Alternative, the remaining wind turbines would continue to represent an impediment to aerial firefighting, although over a smaller project footprint. Under this alternative, fires that initiate in the Project Area and spread to adjacent habitats and watersheds would still result in adverse impacts to common and special-status wildlife species. Impacts that result from the initiation and or spread of wildfires would be considered significant and unavoidable.

Although the Reduced Project Alternative would result in diminished operational impacts associated with bird and bat collisions and uncontrollable wildfire relative to the proposed project, impacts would continue to be considered significant and unavoidable.

Climate Change and Greenhouse Gas Emissions

With the Reduced Project Alternative, the impacts to GHG emissions would be similar to those of the proposed project. Short-term construction GHG emissions would occur at a reduced level when compared with the proposed project. Compared with the proposed project, the Reduced Project Alternative would produce less electricity from renewable energy, resulting in a smaller net GHG reduction. With the Reduced Project Alternative, the impacts of GHG emissions would continue to be less than significant.

Cultural and Tribal Cultural Resources

With the Reduced Project Alternative, impacts related to cultural and tribal cultural resources would be similar to those of the proposed project. Construction activities would be the same as the proposed project and while the Reduced Project Alternative proposes a smaller project footprint, ground disturbance is still proposed in an archaeologically sensitive area increasing the likelihood of exposing buried cultural resources that could constitute a significant impact without mitigation. Furthermore, the 22 proposed turbines would impact a historical resource known as Hatchet Ridge-Bunchgrass Mountain because it is less than one mile from the Reduced Project Alternative footprint with clear views to and from Hatchet Ridge-Bunchgrass Mountain. The historical resource draws its significance in part from the ceremonial areas located on the ridge and mountain. Tribal ceremonial practices depend upon wide, tranquil, natural vistas from specific elevated positions along the ridge and mountain. One string of wind turbines already occupies a portion of Hatchet Ridge-Bunchgrass Mountain, although the addition of 22 new and larger wind turbines within this historical resource's southern and southwestern vistas would spoil these remaining viewsheds for ceremonial purposes.

Lastly, this alternative still proposes to change the natural topography and construct turbines in a rural area held significant to the local Pit River Tribe, which is also within

the tribal cultural resource known as the Montgomery-Hatchet Creek Tribal Cultural Landscape. Although the Reduced Project Alternative would result in diminished construction and operational impacts overall relative to the proposed project, impacts would continue to be considered significant and unavoidable for cultural and tribal cultural resources.

Efficiency and Energy Resources

Although the Reduced Project Alternative would have fewer turbines than the proposed project, it would not reduce impacts to Efficiency and Energy Resources. Compared to the proposed project, the smaller construction footprint of this alternative may utilize less energy resources during construction. However, construction of the Reduced Project Alternative would still require fuel consumption, resulting in impacts to energy resources that would remain less than significant. Impacts during operations would also remain the same as the proposed project (less than significant), because wind turbines harness the kinetic energy of the wind and convert it into mechanical energy. Wind energy is an abundant resource that cannot be depleted, and unlike non-renewable energy resources that benefit from less utilization, lesser number of turbines would have no effect on this energy resource's capacity.

Forestry Resources

The Reduced Project Alternative would temporarily convert 322 acres of timberland and permanently convert 362 acres of timberland. The acreage of timberland conversion under this alternative would be less than the proposed project. The 322 acres of temporary disturbance would be revegetated following construction of the alternative, and implementation of FOREST-2 would be required to ensure that forest regeneration is successful. FOREST-2 would specify steps for restoration of timber resources on temporarily impacted forest lands, and implementation of this mitigation would ensure that temporary impacts to forest land are less than significant.

The Reduced Project Alternative would not construct turbines F03, K06, K07, L06, M06, and M07, which are proposed in areas containing natural stands of timber. While this modification would avoid impacts to specific timber stands, construction and operation of the Reduced Project Alternative would result in a permanent conversion of 362 acres of Site Class I and Site Class II timberland. Given the ongoing rate of conversion of timberland in California, and the quality of the alternative site's timber resources (i.e., Site Class I within a TPZ), the overall effect from Site Class I and Site Class II timberland conversion would remain a significant impact. As a utility-scale wind energy facility, this alternative would be an incompatible use within a TPZ and would require an immediate rezone which is a form of timberland conversion. The Reduced Project Alternative would create a significant and unavoidable impact to Forestry Resources due to a LORS non-compliance with a TPZ, as well as the permanent conversion of 362 acres of high and intermediate quality forest land (i.e., Site Class I and Site Class II) to non-forest use.

Geology, Paleontology, and Minerals

The decrease in the number of wind turbines, length of access roads, and the size of the electrical collector system as a result of the Reduced Project Alternative would diminish the amount of ground disturbance. However, a reduced footprint would continue to have a less-than-significant impact to paleontological, mineral or geologic resources within the active project area.

Hazards, Hazardous Materials, and Wildfire

The severity of hazards, hazardous materials, and wildfire impacts under the Reduced Project Alternative would be similar to the proposed project, although slightly reduced in their geographic extent. The types of construction activities and hazardous material use under the Reduced Project Alternative would be the same as those proposed under the proposed project. Despite the slightly smaller project footprint, a windfarm facility with tall wind turbines would still be constructed and operated under the Reduced Project Alternative, resulting in only slightly decreased impacts related to aviation hazards and emergency response and evacuation at the project site.

Risk of and hazards from wildfire for the Reduced Project Alternative would be slightly less due to the decrease in the project area and the shorter duration of construction activities. However, impacts on emergency plans as related to aerial firefighting would remain potentially significant and unavoidable given that the layout of the wind towers under the Reduced Project Alternative would continue to represent an impediment to aerial firefighting. Impact determinations for hazards, hazardous materials, and wildfire under the Reduced Project Alternative would remain the same as for the proposed project.

Land Use and Agriculture

Land use and agriculture-related impacts under the Reduced Project Alternative would be similar to the proposed project. Although the Reduced Project Alternative would have fewer turbines, it would still meet the County's definition of a "large wind energy system" as it would be constructed for large-scale generation and transmission of electricity on a commercial level (municipal code sections 17.88.035 and 17.88.335). As a large wind energy system, the Reduced Project Alternative would not be permitted within any zone district per municipal code section 17.88.335(C). Given that the alternative would be sited within an unincorporated area of the County, construction and operation of the Reduced Project Alternative would not conform with the County's municipal code. The alternative would also create a conflict with agricultural zoning as it would be located within a TP district that allows grazing as a permitted activity. Because a large wind energy system is a prohibited use within a TP district, construction and operation of the Reduced Project Alternative within a TP district would conflict with existing agricultural zoning.

Similar to the proposed project, the Reduced Project Alternative would be required to comply with the Subdivision Map Act in order to ensure site control throughout the life

of the project. Implementation of LAND-1 would bring the alternative into compliance with this regulation.

Construction and operation of a Reduced Project Alternative would require implementation of a Traffic Management Plan as described for the proposed project, which would prevent the preclusion of access or interference with an established land use. This alternative would not relocate turbines or appurtenant structures onto or adjacent to designated Farmland or lands enrolled in a Williamson Act contract. As such, the Reduced Project Alternative would not create an impact related to Farmland conversion or conflict with a Williamson Act contract.

Noise and Vibration

Under the Reduced Project Alternative, the approximately 5,000 feet distance between the nearest residence (R-4) to any turbine will remain unchanged from the proposed project. Therefore, a reduction in the number of wind turbines under this alternative would not substantially reduce the construction and operational noise levels at sensitive receptors. Noise and vibration impacts would remain the same as the proposed project.

Public Health

Potential public health impacts under the Reduced Project Alternative would be similar to those of the proposed project. During construction, health risks from toxic air pollutants would be slightly reduced due to the shorter duration of construction activities and smaller construction footprint. The public health impacts of operation and maintenance of the Reduced Project Alternative, which would include an emergency generator, would be the same as the proposed project. Under this alternative, the health effects would continue to be less than significant.

Socioeconomics

Socioeconomic-related impacts under the Reduced Project Alternative would be similar to the proposed project. For the construction phase, there may be slightly fewer workers under this alternative due to the reduced number of turbines and smaller construction footprint. As discussed for the proposed project, a local workforce would likely be available to construct the alternative, and therefore, construction would not directly or indirectly induce population growth. Impacts from construction of the alternative would remain less than significant.

The operations phase under this alternative would be the same as the proposed project but with fewer turbines, and therefore would have similar effects on public services. With no displacement of existing people or housing, and no expected population growth, there would be no expected changes to use of police protection, schools, parks, or recreational facilities that would cause new or physically altered facilities. As such, the Reduced Project Alternative would not create an impact related to housing or public services and facilities. Given the small number of full-time employees on site (i.e., up to 8 full time employees), the impacts resulting from an increased need in fire protection

services would continue to be less than significant. However, staffing for fire protection would remain an issue in Shasta County under this alternative, which is discussed in **Section 4.4, Worker Safety and Fire Protection**.

Solid Waste Management

As the Reduced Project Alternative would continue to construct and operate a wind energy facility, the impacts associated with solid waste generation would be similar to the proposed project. While this alternative would decrease the number of wind turbines, length of access roads, and the size of the electrical collector system, overall impacts to solid waste management would remain less than significant.

Transmission Line Safety and Nuisance

The reduction of wind turbines would result in fewer collector feeder constructions, leading to a lower de-rated ampacity of underground conductors due to electromagnetic fields (EMF). By using low-voltage overhead collector feeders throughout the wind facility, the applicant could reduce the EMF values under the collector feeders. However, the Reduced Project Alternative would not substantially reduce the overall effects of the proposed project on Transmission Line Safety and Nuisance, which were determined to be less than significant.

Transportation

With the Reduced Project Alternative, impacts to transportation would be similar to those of the proposed project. The alternative would require short-term construction activities such as moving workers and construction material to the site. The project access intersections would continue to be constructed under this alternative and associated measures to make the project access intersections compliant with Caltrans design standards would be required. Long-term maintenance and operation would still be needed under this alternative. Furthermore, while the Reduced Project Alternative would generate less VMT during construction and operations and maintenance than the proposed project, the overall effect of the alternative's VMT generation would remain less than significant.

Visual Resources

While omitting turbines B2-B5, C2-C8, and F1 would effectively eliminate the project's most severe, significant visual resources impact (i.e., views from the SR-299 corridor approaching from the east), significant visual resources impacts would still be experienced when viewing the project from select locations along SR-299 immediately north and northwest of the project and when viewing from several dispersed, individual residences and residential enclaves (e.g., Moose Camp) in the vicinity of the project and in the Montgomery Creek area (primarily west and north of SR-299). Mitigating those impacts would require omitting too many turbines for the project to remain viable. Although omitting turbines C2 through C8 under the Reduced Project Alternative would also reduce the visual resources impacts experienced in the Montgomery Creek area

and at other dispersed residences, the overall visual impact of the wind energy facility would remain significant.

Nighttime lighting impacts would also remain similar to the proposed project. Under the Reduced Project Alternative, required turbine hazard safety lighting (two flashing red lights per turbine) would continue to create a new source of night lighting (in an area presently absent such lighting) that would adversely affect nighttime views. As discussed for the proposed project, this impact would not be mitigated to a less than significant effect even with the implementation of an FAA-approved Aircraft Detection System.

Water Resources

Although the decrease in the number of wind turbines, length of access roads, and the size of the electrical collector system under the Reduced Project Alternative would diminish the amount of ground disturbance, there would be little change in the overall impact to water resources within the active project area. Under the Reduced Project Alternative, stormwater management, compliance with Clean Water Act sections 404 and 405, reliance on regional and on-site groundwater for water supply, and on-site waste-water treatment would still be necessary. Impacts would remain less than significant with mitigation.

Consumer Benefits

The consumer benefits under the Reduced Project Alternative would be similar to the proposed project, although given the smaller project size, the construction period and number of workers may be reduced. According to the proposed project's economic impact assessment, the project is estimated to generate approximately $60 million in property tax revenues over the life of the project (2021-dollar terms), which is an average of about $1.7 million annually. Under current tax allocation factors from the Shasta County Auditor-Controller Office, about $7.5 million of the project lifetime total would accrue to the county, $4 million to cities, $3.6 million to special districts, $8 million to Redevelopment Property Tax, $9 million to the Educational Revenue Augmentation Fund, and $28 million to schools (see TN 250915).

No substantial evidence exists in the record of general consumer benefits from the project such as broader electricity price reduction or improved reliability. The applicant docketed a revised economic impact assessment on July 3, 2023, which discusses the socioeconomic benefits of the project to the local community and county (see TN 250915). Potential local benefits from the project as stated in the economic impact assessment include the following: project construction is estimated to generate 142 direct job-years, resulting in about $11.8 million in employee compensation. Total construction-related economic output for Shasta County from direct, indirect, and induced effects is estimated to be about $60 million. Project operation would provide 8 direct job-years, resulting in about $1 million in employee compensation. Total operation-related economic output for Shasta County from direct, indirect, and induced effects is estimated to be about $6 million each year during its 35-year lifetime.

Cumulatively over the 35-year period, project operations would provide approximately 1,456 job-years, $90.4 million in employee compensation, and $210.3 million in economic output/sales activity in the County.

In addition to the economic benefits outlined by the applicant, staff would require Condition of Certification WORKER SAFETY-8 for the Reduced Project Alternative to address existing problems with staffing at local fire stations in the project area. Condition of Certification WORKER SAFETY-8 would require the applicant to fund a portion of a new fire station in Montgomery Creek (i.e., $1 million in capital costs plus annual payments for staffing).

Impacts on Grid Reliability

Impacts to grid reliability under the Reduced Project Alternative would be similar to the proposed project because the operational parameters such as capacity factor and seasonal generation are expected to be similar.

LORS Consistency

The Reduced Project Alternative would be inconsistent with the County's LORS, specifically Shasta County Municipal Code sections 17.88.035, 17.88.100, and 17.88.335 prohibiting a large wind energy system within an unincorporated area of Shasta County. Therefore, this alternative would require the CEC make findings as set forth in Public Resources Code section 25525.

Summary Comparison

Table 8-6 provides a summary comparison of the Fountain Wind Project environmental impacts and those of the Reduced Project Alternative.

TABLE 8-6 COMPARISON OF FOUNTAIN WIND PROJECT AND REDUCED PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	Reduced Project Alternative
Air Quality		
Conflict with or obstruct implementation of the applicable air quality plan	PSM	PSM
Result in a cumulatively considerable net increase of any criteria pollutant	PSM	PSM
Expose sensitive receptors to substantial pollutant concentrations	PSM	PSM
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	LS	LS
Biological Resources		
Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	SU	SU

TABLE 8-6 COMPARISON OF FOUNTAIN WIND PROJECT AND REDUCED PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	Reduced Project Alternative
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 Wildlife or U.S. Fish and Wildlife Service	SU	SU
Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means	SM	SM
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 wildlife nursery sites	SU	SU
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	SU	SU
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan	None	None
Climate Change and Greenhouse Gas Emissions		
Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment	LS	LS
Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions	LS	LS
Cultural and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of a historical resource	SU	SU
Cause a substantial adverse change in the significance of a unique archaeological resource	PSM	PSM
Disturb human remains	PSM	PSM
Cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in California Register of Historical Resources, or in a local register	None	None
Cause a substantial adverse change in the significance of a tribal cultural resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant	SU	SU
Efficiency and Energy Resources		
Impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation	LS	LS
Conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	LS
Forestry Resources		
Conflict with zoning for forest land or timberland	SU	SU

TABLE 8-6 COMPARISON OF FOUNTAIN WIND PROJECT AND REDUCED PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	Reduced Project Alternative
Conversion of forest land	SU	SU
Create other changes in the environment that contribute to loss of forest land	SM	SM
Geology, Paleontology, and Minerals		
Increase the risk of loss, injury, or death due to geologic hazard	LS	LS
Destroy a unique paleontological resource or geologic feature	LS	LS
Result in the loss of an available mineral resource	LS	LS
Hazards, Hazardous Materials, and Wildfire		
Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	SM	SM
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	SM	SM
Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	None	None
Be 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 or excessive noise for people residing or working in the project area	SM	SM
Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	LS	LS
Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires	SM	SM
Substantially impair an adopted emergency response plan or emergency evacuation plan in a very high fire hazard severity zones	PSU	PSU
Exacerbate wildfire risks and expose project occupants and the public in nearby communities to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire	SM	SM
Project infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or may result in temporary or ongoing impacts to the environment	SM	SM
Expose people or structures to downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes	SM	SM
Land Use and Agriculture		
Create a conflict with an established land use	LS	LS
Conflict with local land use plans, policies, or regulations	SU	SU
Conflict with agricultural zoning	SU	SU
Noise and Vibration		
Generation of a substantial increase in ambient noise levels	PSM	PSM

TABLE 8-6 COMPARISON OF FOUNTAIN WIND PROJECT AND REDUCED PROJECT ALTERNATIVE

Issue Area	Fountain Wind Project	Reduced Project Alternative
Generation of excessive groundborne vibration levels	LS	LS
Public Health		
Expose sensitive receptors to substantial pollutant concentrations or result in other public health impact	LS	LS
Socioeconomics		
Induce unplanned population growth or displace people or housing	LS	LS
Impact the public services in Shasta County, including fire and police protection, schools, parks and recreational facilities or other public facilities	LS	LS
Solid Waste Management		
Generate solid waste in excess of the capacity of local infrastructure	LS	LS
Transmission Line Safety and Nuisance		
Electric Field and Electro Magnetic Field	LS	LS
Transportation		
Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities	LS	LS
Conflict or be inconsistent with CEQA Guidelines, section 15064.3, subdivision (b)	LS	LS
Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	PSM	PSM
Result in inadequate emergency access	LS	LS
Visual Resources		
Substantially degrade landscape integrity and visual quality	SU	SU
Create a new source of night lighting	SM	SM
Water Resources		
Violate water quality standards or waste discharge requirements	PSM	PSM
Decrease groundwater supplies	PSM	PSM
Substantially alter the existing drainage pattern of the site	PSM/LS	PSM/LS
Have sufficient water supplies	PSM	PSM
On-site waste-water treatment	PSM	PSM
LORS Consistency	Inconsistent	Inconsistent

Notes:
The following impact conclusions correspond to impact determinations of the Fountain Wind Project, as provided within each environmental analysis section of this EIR:

None = No impact
Beneficial = Beneficial impact
Unknown = Significance of impact is unknown
LS = Less than significant impact, no mitigation required

SM or PSM = Significant/Potentially significant impact that can be mitigated to less than significant
SU or PSU = Significant/Unavoidable or Potentially significant/Unavoidable impact that cannot be mitigated to less than significant

8.7.3 Battery Energy Storage System Alternative

After extensive independent review of alternatives information collected by staff during the evaluation of the project, staff has determined that a battery energy storage system, (BESS) is a feasible option for reducing the proposed project's potentially significant impacts and complying with relevant LORS, while meeting the following basic project objectives identified by staff:

- Assist California in meeting renewable energy generation or zero carbon targets set forth in SB 100.
- Interconnect to the Northern California electrical grid with available capacity.

In addition, when evaluating whether an alternative is more prudent and feasible than the proposed project, the following categories identified in Public Resources Code section 25525 are considered for the proposed project and alternative:

- The environmental impacts;
- The consumer benefits; and
- The impacts on grid reliability.

Overview

As discussed in subsection 8.3.1, staff has concluded that the first basic objective for the proposed project is to assist California in meeting renewable energy generation or zero carbon targets set forth in SB 100. The 2021 SB 100 Joint Agency Report determined that a key factor in reaching the SB 100 renewable energy targets is to prioritize load flexibility within the transmission system through a diverse energy portfolio combined with battery storage (CEC 2021a). The 2021 SB 100 Joint Agency Report modeled various scenarios for meeting the SB 100 energy targets and found that the amount of battery storage identified by each model scenario to support SB 100 implementation ranged from 38 GW to 48 GW by 2045, with 9.5 GW of new installations by 2030 (CEC 2021b). In the CEC's subsequent Report to the Governor on Priority SB 100 Actions to Accelerate the Transition to Carbon-Free Energy, the CEC reiterated the need to invest in energy storage research and development (CEC 2021b). As of 2024, the state projects a need of 52,000 MW of battery storage (CEC 2024a).

A BESS may be sited in conjunction with a renewable energy generation facility to help with system reliability and quick dispatch of power, or sited independent of a generating facility. These energy storage systems allow for the capture and storage of surplus energy generated, mostly from excess solar generation during the day. The stored energy can be discharged during other times as needed, such as the critical 4

p.m. to 9 p.m. period in the summer months when thousands of megawatts of solar are coming off the system, and natural gas generation has to come online.[3]

There are two types of long duration and large capacity battery systems: lithium-ion battery systems and flow battery systems:

- **Lithium-Ion Battery Systems.** The most common type of battery used in grid energy storage systems are lithium-ion batteries given their high energy density and competitive cost (Twitchell et al. 2023). Nearly all newly procured utility-scale storage in California has consisted of 4-hour lithium-ion battery systems (CEC 2021a). As these battery systems utilize a flammable electrolyte, there are multiple national and international codes and standards that have been adopted to guide their installation and operation (i.e., Underwriters Laboratories (UL) 9540, UL 9540A, National Fire Protection Association (NFPA) 70, and NFPA 855) (Twitchell et al. 2023). These codes are regularly updated to address improvements in technology.
- **Flow Battery Systems.** While flow battery components are not flammable, these battery systems use large tanks of liquid electrolyte containing metals such as vanadium or iron, which could pose hazards to human health or affect groundwater if released (GAO 2023). Utility-scale flow battery systems are still considered an emerging technology. Vanadium is frequently used in flow battery systems, although this metal is expensive and does not have a well-established supply chain (Stauffer 2023). Other systems that utilize iron or zinc are currently under research and development as a lower-cost alternative to vanadium flow batteries. A utility-scale iron flow battery system has been proposed within the Sacramento Municipal Utility District's (SMUD) electrical grid, with a proposed development target of providing 200 megawatts (2 gigawatt-hours) of energy storage (SMUD 2022).

Feasibility

As noted, feasibility is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (California Code of Regulations, title 20, section 1201(h)).

Battery energy storage systems meet this definition of feasible as demonstrated by the fact that there are numerous installed and operating systems at both the utility and residential scale in California. The state currently has over 8,700 MW of installed utility scale BESS projects of the type considered in this alternative analysis (CEC 2024a). Three Shasta County battery storage projects have been recently proposed within the Northern California electrical grid, including a proposed 300 MW battery storage project in the Round Mountain community, which is less than five miles from the proposed

3 CAISO provides hourly updates on demand and supply forecasts and actual loads, including battery charge and discharge data: https://www.caiso.com/TodaysOutlook/Pages/supply.html

project site (CAISO 2024). These proposed BESS projects evidence the overall feasibility of a battery storage project alternative within the region.

A BESS is capable of being accomplished in a reasonable amount of time. The proposed project is expected to take 24 to 28 months to construct. Utility scale battery systems can be installed in approximately 8 to 16 months. Construction of the 200 MW Zeus BESS project, located in San Joaquin County, is expected to take 8 to 9 months (TN 254396, Docket 08-AFC-07C). The BESS project to be constructed at the CEC's jurisdictional Henrietta facility, located in Kings County, is expected to take 11 months (Docket 01-AFC-18C, TN 245663, p31). The operating 350 MW Vistra BESS, located in Monterey County, took 16 months to build (Vistra 2023). These real-world timelines evidence the ability for a BESS alternative to be completed in a shorter time period than the proposed project.

A BESS alternative would be significantly cheaper to construct than a wind farm. According to a Bloomberg study, the average cost of lithium-ion batteries was $132 per kWh in 2021, which was a 6% drop in price from the prior year in 2020 with $140/kWh (Vahle 2023). The proposed project is expected to cost $362,490,282 (See TN 248292-2 p. 4) compared with a utility scale BESS at $105,600,000.[4] Thus, a BESS would not be cost prohibitive.

Assist California in meeting renewable energy generation or zero carbon targets set forth in SB 100. A BESS would achieve the project objective of assisting California in meeting renewable energy generation or zero carbon targets set forth in SB 100. California is a world leader in energy storage with the largest fleet of batteries that store energy for the electricity grid. Energy storage is an important tool to support grid reliability and complement the state's abundant renewable energy resources. These technologies capture energy generated during non-peak times to be dispatched at the end of the day and into the evening as the sun sets and solar resources go offline, reducing dependence on fossil fuel generation to meet peak loads (CEC 2024a).

Energy storage such as a BESS can improve the flexibility of a transmission system especially when sited in areas that experience transmission congestion or sudden changes in generation and demand. A BESS system can take surplus solar energy during the day and discharge it at the critical period of 4 p.m. to 9 p.m., potentially replacing in-state or out-of-state generation from natural gas facilities.

A review of the CAISO's web-based portal "Today's Outlook Supply" for a typical summer day, July 21, 2023, shows solar generation reaching 15,000 MW with 2,000 MW of battery systems being charged during the time solar output was climbing.[5] Battery discharge reached its peak in the early evening at over 3,000 MW. This pattern

4 Cost of BESS assumes a 200 MW battery system (4-hour duration, 800 MWh), at an average cost of $132/kWh.

5 Today's Outlook Supply is hosted by CAISO and is available at the following link: https://www.caiso.com/TodaysOutlook/Pages/supply.html

of charging and discharging in conjunction with the change in solar output reflects an important strategy to manage the grid to absorb solar generation, integrate renewables, and increase grid reliability. At a utility-scale, energy storage systems provide power over a short duration (i.e., up to four hours). Short-term energy storage is a key requirement to support increased renewable generation and fully decarbonize the grid as envisioned under SB 100, and a BESS would meet this project objective.

The applicant has stated in its project description that the proposed project has an expected capacity factor of 26-32%. CEC wind generation data from the Hatchet Ridge Wind development, with the optimum site on top of Hatchet Ridge, indicates that the Hatchet Ridge Wind facility tends to have a lower capacity factor in the summer and higher in the winter. For example, between July and October of 2022, the monthly capacity factor ranged from 13% to 23%, with the July, August and September capacity factor averages from 2014 to 2022 being 21.7%, 21.3% and 26.1% respectively (CEC 2022b). The Hatchet Ridge Wind facility is sufficiently similar in location to the proposed facility to be instructive regarding when and how energy generation would likely serve the statewide needs. The generation is at its lowest level when statewide energy needs are at their greatest, and is not able to target the critical period of between 4:00 p.m. and 9:00 p.m. in the summer months.

While an energy storage system is not equivalent to new utility-scale generation, a battery storage system would be potentially superior in supporting grid reliability during the critical net peak period of 4 p.m. to 9 p.m., as well as offsetting natural gas derived electricity generation, a key goal of SB 100, 100% carbon free electricity by 2045, and a project objective.

Determining the amount of CO2e (carbon dioxide equivalent)[6] that is displaced from the generation of wind power or from the discharge of batteries, requires some key assumptions such as:

- The capacity factor of the wind farm and thus its total generation,
- Whether there are curtailments in the wind farm's generation,
- The efficiency of the fossil power plant generation being displaced by the wind power or battery discharge, and
- The source of the electricity to charge the battery.

Section 5.3, Climate Change and Greenhouse Gas Emissions, contains the calculation of the annual savings of CO2e attributed to the proposed project. Each MWh of wind generation could displace approximately 822.5 pounds CO2e or 0.373 metric tons (MT) CO2e from natural gas peaking plants (CEC 2019). Using the proposed project's total nameplate generating capacity of up to 205 MW and assuming a best-case average capacity factor of 32 percent, the project is anticipated to generate up to

6 CO2e signifies the number of metric tons of carbon dioxide (CO2) emissions with the same global warming potential as one metric ton of another greenhouse gas.

approximately 574,000 MWh per year. Thus, the project would provide a potential net offset of 214,000 MT CO2e per year, if the electricity generated by the project were to be used in place of electricity generated by fossil fuel sources. After accounting for the annualized construction and operational emissions of 3,194 MT CO2e per year, the project would provide a potential net offset of 210,806 MT CO2e per year.

Ultimately, the final calculated amount relies on the assumed total annual generation estimated by the applicant. As noted, the applicant estimates a capacity factor for the project to be between 26%-32% and for purposes of its GHG displacement estimate, has selected the high end at 32% (ESA 2020). The applicant then uses the CARB heat rate that implicitly assumes all generation that would be displaced would come from a peaker plant, which is not an accurate reflection of generation on the grid. Peaker plants are not intended to operate for long periods, and due to their heat rate would be too expensive to operate compared to a more efficient combined cycle plant. Also, peakers operate the most in the summer as solar comes off the system, when data shows the nearby Hatchet Ridge Wind Farm has its lowest capacity factor, thus indicating that the project is less likely to displace generation from peakers (CEC 2022b).

Given the operational pattern of a BESS to be discharged during periods when more natural gas comes onto the system and charged during times of high solar generation, it is reasonable to assume for calculating GHG offsets that an alternative 250 MW BESS facility would charge with renewable energy, and during periods of discharge, thereby offsetting some mix of peaker and combined-cycle plants that would otherwise be dispatched. Using these assumptions, and using data reported to the CEC through the Quarterly Fuel and Energy Reporting data for 2022, combined cycle power plants have an overall average heat rate of 7,310 Btu/kWh. Peaker plants have an average heat rate of 10,073 Btu/kWh (CEC 2024b). Using these two heat rates as the range of potential offset GHG emissions, one can estimate that a 250 MW BESS offset is between 96,986 and 133,644 metric tons of CO2e.

While exact quantities of avoided emissions are not possible given the fluid nature of energy systems, both the proprosed project and a BESS Alternative would contribute to a reduction in CO2 emissions by offsetting the need for generation from fossil fuel power plants.

Interconnect to the Northern California electrical grid with available capacity. A BESS Alternative is not just limited to the proposed project site but has the advantage of being suitable for multiple sites within the wider region. There are other sites in Shasta County for which an energy storage system could be suitable for managing transmission congestion (e.g., substation site) or for integrating an intermittent generation source into the transmission grid (e.g., co-generation plant). As part of its generation interconnection planning process, the California Independent System Operator (CAISO) maintains a comprehensive list of Cluster 15 Interconnection Requests submitted by potential generators. Once each project is validated, it will be

published in the ISO Generation Queue. Table 8-7 lists the Cluster 15 Interconnection Requests that were submitted for Shasta County projects in 2023.

TABLE 8-7 CLUSTER 15 INTERCONNECTION REQUESTS FOR SHASTA COUNTY (2023)

Project Name	Type	Net MW	PTO	POI
Anderson River BESS	Battery Storage	200 MW	PG&E	Cottonwood 230 kV Substation
Crossroads 2	Battery Storage	313 MW	PG&E	Round Mountain 230 kV Substation
Meadow Ridge 2	Solar PV Battery Storage	180 MW 47 MW	PG&E	PIT#1 - Cottonwood 230 kV line and Round Mountain - Cottonwood #3 line

Source: CAISO 2024
Notes:
PTO = Participating Transmission Owner; POI = Point of Interconnect

As shown in **Table 8-7**, three Shasta County battery storage projects have been recently proposed within the Northern California electrical grid, including a proposed 300 MW battery storage project in the Round Mountain community, which is less than five miles from the proposed project site (CAISO 2024). These proposed BESS projects evidence the feasibility of a battery storage project at alternative connection points within the region.

Description

The following is a description of the BESS Alternative, which has been developed to avoid or substantially lessen significant effects of the proposed project per CEQA requirements.

An approximately 200 MW BESS would be constructed at the proposed project site in proximity to the existing PG&E 230-kV transmission line. Based on the size of existing and recently sited 200 MW BESS facilities, staff estimates that up to 12 acres would be required to construct and operate this alternative (EIA 2024; City of Grand Terrace 2021, County of San Diego 2020 and 2023). Staff identified two possible locations for a 12-acre BESS site that would be adjacent to the 230-kV transmission line (see Figure 8-2). Both of these potential sites are of sufficient size to accommodate a staging and laydown area adjacent to a BESS facility.

- Site A: This is the site of the proposed project's 13-acre substation/switchyard, which is located within project parcel 029-190-010 and would be adjacent to the 230-kV transmission line. This parcel has a Shasta County zoning designation of Timber Production (TP).
- Site B: This would be a 12-acre site within a 241-acre parcel (project parcel 031-010-003), which is near SR 299 and the transmission corridor. Staff has determined through preliminary desktop screening analysis that this parcel may be suitable for a BESS facility as it is relatively level and can be accessed from existing timber roads. The exact location of a 12-acre BESS facility would be sited in an area of the parcel that requires minimal ground disturbance (e.g., excavation, grading, vegetation

clearance). This parcel has a Shasta County zoning designation of Timber Production (TP).

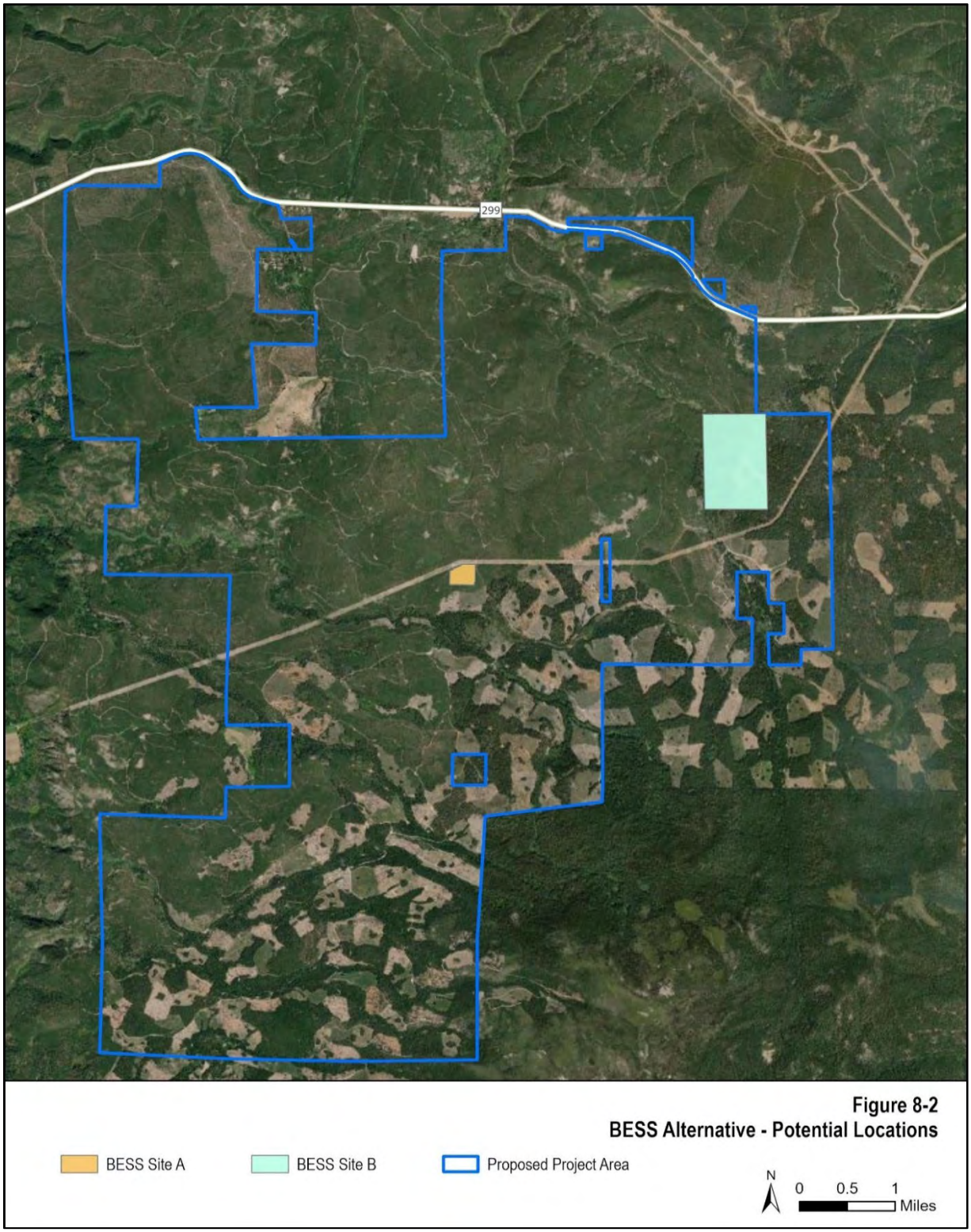


Figure 8-2
BESS Alternative - Potential Locations

A BESS would be consistent with the County's TP zoning designation. While the County's applicable policies and zoning regulations do not specifically address BESS facilities, a BESS would meet the definition of a "public utility" per the County's municipal code section 17.02.430.[7] Municipal code section 17.88.100 states that the County allows for public utilities in all zoning districts with the exception of large wind energy systems. A BESS facility is not included in the prohibition of large wind energy systems set forth in municipal code section 17.88.335. Furthermore, the County submitted comments to the Fountain Wind Project Docket on November 15, 2024, stating that battery storage projects are consistent with General Plan objectives for alternative energy sources (Shasta County 2024).

The BESS Alternative would consist of the following:

- Lithium-ion batteries. Staff assumes that the BESS Alternative would utilize a lithium-ion battery or a similar battery technology given the extensive integration of this technology for utility scale energy storage, and given the adopted codes and standards that guide installation, management, and removal/disposal of lithium-ion battery systems.
- Battery storage containers. The batteries would be housed in storage containers that would also contain the battery mangement system, HVAC system, and fire supppression system. Battery storage containers would be approximately 8 feet tall, 10 feet wide, and 20 feet long, and would be constructed on dedicated foundations.
- Power conversion system. The power conversion system would include a bi-directional inverter that connects the direct current (DC) battery system to the alternating current (AC) electrical grid.
- On-site collector substation. The substation would support the interface between the BESS and the electrical grid and would step the voltage up or down, as needed.
- Gen-tie. A gen-tie -line would be constructed from the on-site collector substation to the 230-kV transmission line.
- Fencing and Lighting. The entire BESS site perimeter would be secured with perimeter fencing. Internal safety lighting would be installed in various locations throughout the BESS site.

The BESS would be charged exclusively from the grid, particularly when excess renewable energy is available, storing this energy for later use during peak periods when renewable energy is less available. The BESS Alternative would support California's need for additional electrical energy storage available for dispatch during peak load demand time periods.

7 Shasta County Municipal Code section 17.02.430 defines a public utility to include "[t]he use of land for utility purposes, whether or not owned, controlled or operated by a public entity, whose services are performed for, or commodities delivered to the public or any portion thereof. Private energy production, transmission relay, repeater, translator, radio and television towers and equipment and cable television facilities are also considered public utilities."

Construction of the BESS Alternative would require approximately 12 months. The following equipment would be typical for construction of a BESS (City of Commerce 2022, City of Grand Terrace 2021, County of San Diego 2020):

- Excavator (2)
- Backhoe (2)
- Bulldozer (1)
- Roller/Compactor (1)
- Dump truck (2)
- Concrete mixer (3)
- Flatbed-mounted utility crane (1)
- Portable generator and welding equipment (1)
- Forklift (1)
- Pickup trucks (4)
- Utility line trucks (2)
- Water truck (1)

The operational lifespan of the BESS Project would be approximately 30 years after which time the facility would be decommissioned. Decommissioning of the facility would last approximately 12 months. Following decommissioning, the alternative site would return to a use that is consistent with the County's zoning designation of Timber Production (TP).

Environmental Analysis

An alternative may be considered an environmentally superior option if it avoids all or most of the potentially significant environmental impacts associated with the proposed project. For a project that is inconsistent with LORS, an alternative that avoids the significant environmental impacts and is consistent with LORS may support a finding that the alternative is more prudent and feasible at achieving public convenience and necessity. The following analysis compares the potential impact of the project with the potential impact of the BESS Alternative on the technical areas with significant impacts as well as a review of the alternative on other technical areas.

To determine the impacts of a hypothetical BESS Alternative, staff considered relevant information from the following BESS projects:

- Zeus 200 MW Battery Energy Storage System Project (MRP SJE 2024);
- Westside Canal 2,000 MW Battery Storage Project (Imperial County 2021a and 2021b);
- Commerce Energy Storage Project (City of Commerce 2022);

- Condor 200 MW Battery Energy Storage Facility (City of Grand Terrace 2021); and
- Elkhorn 182.5 MW Battery Storage Facility (County of Monterey 2019).

Air Quality

With the BESS Alternative, the impacts to air quality would be similar to those of the proposed project. The BESS Alternative would reduce the quantities of construction-related air emissions due to fugitive dust and exhaust from heavy duty construction equipment due to the reduced duration of construction activities and smaller construction footprint when compared with the proposed project. The air quality impacts during operation and maintenance of the BESS Alternative would be either slightly reduced or similar to those of the proposed project, depending on whether the alternative would include an emergency generator. With the alternative, the air quality impacts would continue to be less than significant with mitigation incorporated.

Biological Resources

Under the BESS Alternative, approximately 12 acres of densely forested timberlands would be permanently removed. The remaining 2,855-acre project site would continue to be managed for timber production and would maintain its current designation as "Timberlands." Direct impacts during construction, such as vegetation removal, increased noise and human presence, and potential exposure to hazardous materials, would be similar in type but substantially reduced in magnitude compared to the proposed project. With the implementation of the same COCs developed for the proposed project, construction impacts would be less than significant under the BESS Alternative.

The BESS Alternative would substantially reduce the risks associated with bird and bat collisions because no wind turbines would be constructed. However, impacts could continue to occur from collisions with structures under this alternative, such as the gen-tie line. The BESS Alternative would continue to pose a potential fire risk. However, impacts with impeding aerial firefighting would be avoided. With the implementation of the same COCs developed for the proposed project, operational impacts would be less than significant under the BESS Alternative.

Cultural and Tribal Cultural Resources

The BESS Alternative would reduce the overall construction footprint and ground disturbance to 12 acres. However, construction would still occur in an archaeologically sensitive area where there is a high likelihood of uncovering unknown buried resources. The battery storage containers, at eight feet tall, are unlikely to be visible from outside the site due to terrain and vegetation screening. However, taller structures like the collector substation and the gen-tie line may be visible from State Route 299 (SR-299) and surrounding higher-elevation viewpoints, including Hatchet Ridge-Bunchgrass Mountain, which is a historical resource under CEQA.

Despite this, the BESS Alternative would be significantly less intrusive to the expansive, tranquil natural vistas observed from elevated areas along the ridge and mountain—views considered sacred by local tribes. Therefore, the BESS Alternative is expected to have a less-than-significant impact on the Hatchet Ridge-Bunchgrass Mountain historical resource. With the implementation of the same conditions of certification as the proposed project, potential impacts to unknown buried resources during construction would also be less than significant.

Regarding the Montgomery-Hatchet Creek Tribal Cultural Landscape, the BESS Alternative would have less intrusive effects during both construction and operation phases. However, the significance of its impact on this cultural landscape remains unknown pending input from the Pit River Tribe.

Climate Change and Greenhouse Gas Emissions

With the BESS Alternative, short-term construction GHG emissions would occur at a reduced level when compared with the proposed project. During operation, no electricity would be generated at the project site, and the energy stored by the BESS facility would need to be produced by a generating facility elsewhere. Compared with the proposed project, the net GHG reduction would occur in a smaller amount. With the BESS Alternative, the impacts of GHG emissions would continue to be less than significant.

Efficiency and Energy Resources

The BESS Alternative would not reduce impacts to Efficiency and Energy Resources. Staff assumes the same energy resources would be utilized during construction and the overall impacts would remain less than significant. There is a fundamental difference between BESS and wind turbines. Batteries store electricity, but don't produce it, while wind turbines produce electricity. The Fountain Wind Project would be a power plant, not an energy storage facility. Nevertheless, the impacts of both the proposed project and the BESS Alternative on efficiency and energy resources would remain less than significant.

Forestry Resources

Under the BESS Alternative, only 12 acres of timberland would be impacted, while the remaining 2,855-acre project site could continue to be used for timber harvesting. This alternative would involve a minimal conversion of high quality forest land. As the entire construction footprint of the BESS Alternative would be limited to 12 acres, temporary disturbance of forest land during construction would not be expected to contribute to an additional loss of forest land outside of the 12 acres. In addition, a BESS facility would be compatible with a TPZ per the County's municipal code section 17.02.430, such that approval of a BESS facility may not require immediate rezoning of a TPZ. Given the minimal acreage of timberland conversion, and the County's zoning regulations that do not prohibit a BESS within a TPZ, impacts to Forestry Resources from implementation of the BESS Alternative would be less than significant.

Geology, Paleontology, and Minerals

The BESS Alternative would diminish the amount of ground disturbance. However, a reduced footprint would continue to have a less-than-significant impact to paleontological, mineral or geologic resources within the active project area.

Hazards, Hazardous Materials, and Wildfire

The BESS Alternative's construction activities would be limited to the 12- or 13-acre sites. However, the BESS Alternative would likely use similar hazardous materials, such as fuels, lubricants, paints, and solvents as the proposed project. These hazardous materials could be stored centrally and would not be used over as large a construction area as the proposed project. Therefore, the BESS Alternative would have decreased impacts related to use, storage, and disposal of hazardous materials. The significantly reduced area of construction and scope of construction activities for the BESS Alternative also reduces the risk of construction triggered wildfire as compared to the proposed project. Due to the forested nature of the project site, construction for the BESS Alternative would have wildfire prevention plans that comply with local and State requirements.

The BESS Alternative would not include any structures that would be subject to FAA regulations or restrictions. Therefore, the BESS Alternative would not present any aviation hazards or significant interference with emergency response plans.

The CEC staff's evaluation of the safety of lithium-ion batteries determined that operation of large lithium-ion BESS installations pose potential hazards related to hazardous materials and wildfire. Because they store large amounts of energy, one of the principal hazards associated with a lithium-ion BESS is fire, which could occur if a charged battery cell was somehow damaged, for example by being opened, punctured, or crushed. A fire could also be caused if a battery cell is short- circuited, overheated, or experiences thermal runaway. After such an event, it may burn rapidly with flare-burning effect and may ignite other battery cells in proximity. A fire from the BESS installation could result in triggering a wildfire.

Additional hazards related to fire and wildfire at a BESS installation include hazardous and/or toxic gases generated by burning of the battery components. Burning of the BESS batteries would produce corrosive and/or toxic gases including hydrogen chloride, hydrogen fluoride, and carbon monoxide, comparable to a fire involving a similar amount of plastics, requiring first responders to wear self-contained breathing apparatus to control the fire safely. Overheating batteries may also produce flammable gases that, under certain circumstances, could lead to an explosion within the BESS container.

The CEC staff has reviewed the current regulatory framework regarding fire and safety as related to the proposed lithium-ion BESS. While the current regulatory framework is evolving to address the risks involved with lithium-ion BESS installations, there are

several current safety standards for BESS facilities that have been developed by industry standards groups including UL and NFPA and by the State of California.

One of the newest, issued in 2019 and revised in September 2022, is NFPA 855: Standard for the Installation of Stationary Energy Storage Systems. Others include UL 9540-2020: Energy Storage Systems and Equipment, which lists requirements for BESSs supporting the local-area electric power systems or the electrical utility power grid, and UL 9540A-2019: Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, which provides the standard test methodology for determining fire and explosion hazards presented by a given BESS design when undergoing an overheating failure, such as thermal-runaway.

The current edition of the California Fire Code (CFC) contains fire safety requirements for stationary lithium-ion BESS. Section 761.3 of the current California Public Utilities Code, as amended in 2023 by California Senate Bill 38, requires preparation of emergency response and emergency action plans to ensure the safety of employees, emergency responders, and surrounding communities. Issuance of these recent standards and codes provide evidence that the regulatory environment is quickly evolving to accommodate new lithium-ion BESS technology and designs as they emerge. These code requirements, coupled with implementation of standard fire protection mitigation such as the submission of a fire protection plan, UL 9540A BESS hazard mitigation analysis, and facility information to the local fire department to ensure the fire department has detailed facility knowledge of the BESS and receives training in battery related fire events specific to the facility, can mitigate impacts of fire related to wildfire and worker safety to a less-than-significant level. In addition, the BESS Alternative would avoid impacts to aerial firefighting that may occur under the proposed project.

Land Use and Agriculture

The BESS Alternative would not conflict with the County's General Plan policies or municipal code. The two potential BESS sites identified in **Figure 8-2** are designated as Timber (T) and zoned as Timber Production (TP). Shasta County General Plan Policy T-b requires that all uses within a Timber Production Zone (i.e., TP district) comply with the applicable zoning provisions of the County's municipal code. As stated in municipal code section 17.08.030, a TP district allows for the construction and operation of an electrical facility with issuance of a use permit. Section 17.88 of the municipal code further states that public uses and public utilities are conditionally permitted in all zone districts with the exception of large wind energy systems. Municipal code section 17.04.430 defines a "public utility" as the following:

> *"Public utility" means the use of land for public utility purposes by an entity providing pipeline, gas, electrical, telephone, telegraph, water or sewage service that is subject to the jurisdiction of the California Public Utilities Commission. "Public utility" also includes the use of land for utility purposes, whether or not owned, controlled or operated by a public entity, whose services are performed for or commodities delivered to the public or any portion thereof. Private energy*

production, transmission relay, repeater, translator, radio and television towers and equipment and cable television facilities are also considered public utilities. "Public utility" does not include airports or television, radio or community television antenna system administration offices or other types of administrative offices or maintenance yards.

A BESS facility would meet the County's definition of a "public facility" as it would provide services (i.e., storage and discharge of electricity) that support the delivery of energy into the transmission grid. Furthermore, a BESS facility is not identified as a prohibited energy technology per municipal code sections 17.88.100 and 17.88.335. Therefore, a BESS facility would be an allowable use within a TP district.

The BESS Alternative would not conflict with agricultural zoning. While grazing is a permitted use in a TP district per County municipal code section 17.08.020, neither of the two potential site locations for a BESS facility would be located on land identified by the DOC as suitable for grazing or in an area that has been used for grazing activities.

A BESS facility would not require subdivision of the parcel(s) on which it would be constructed (e.g., project parcel 029-190-010 or project parcel 031-010-003), and thus would continue to meet the parcel size requirements for a TP district as required by Shasta County General Plan Policy T-c. Similar to the proposed project, the BESS Alternative would be required to comply with the Subdivision Map Act in order to ensure site control throughout the life of the BESS facility. Implementation of LAND-1 would bring the BESS Alternative into compliance with this regulation. As such, the BESS Alternative would comply with the County's applicable Timber policies and TP zoning provisions and would avoid an impact due to a LORS conflict.

All other land use and agriculture-related impacts under the BESS Alternative would be similar to the proposed project. Construction and operation of a BESS facility at the two potential site locations identified in **Figure 8-2** would not preclude access to or interfere with an established land use. As neither of the two potential site locations are located on or adjacent to designated Farmland or lands enrolled in a Williamson Act contract, the BESS Alternative would have no impact related to Farmland conversion nor would it conflict with a Williamson Act contract.

Noise and Vibration

The operation of a BESS facility typically generates less noise and vibration compared to a wind energy generation facility. Therefore, the BESS Alternative would reduce the operational noise and vibration expected under the proposed project. Moreover, the proposed location of the BESS facility is more than 20,000 feet away from the nearest noise-sensitive receptor (R-4), which is a much greater distance compared to the approximately 5,000 feet between the R-4 and any turbine. This means that the BESS alternative would likely have a lower impact in terms of construction noise. However, the BESS Alternative would not eliminate noise impacts, and therefore the overall effect would remain similar to the proposed project (i.e., less than significant with mitigation).

Public Health

The public health impacts under the BESS Alternative would be similar to those of the proposed project. During construction, health risks from toxic air pollutants would be slightly reduced due to the reduced duration of construction activities and smaller construction footprint. The public health impacts during operation and maintenance of the BESS Alternative would be either slightly reduced or similar to those of the proposed project, depending on whether the alternative would include an emergency generator. With the alternative, the health effects would continue to be less than significant.

Socioeconomics

The BESS Alternative would have similar Socioeconomic-related impacts as the proposed project. During construction, fewer workers (i.e., less than 100) are needed for a BESS facility compared to the proposed project, and the construction schedule would be shorter (i.e., a 12-month construction period). During operation, the workforce would be likely smaller than the proposed project with no onsite staff. As discussed in **Section 5.11, Socioeconomics**, the local construction and operation workforce would likely be able to meet the staffing needs of this alternative. As neither construction nor operation of the BESS Alternative would require a large workforce to relocate to the project area, the alternative would not induce population growth in the region.

Given that there would be no notable change in the population from the alternative's construction and operation workforce, there would be no associated increased demand or need for new public services in the County (i.e., fire, police, schools, parks, other public facilities). Therefore, public services impacts would remain less than significant under this alternative. It should be noted that the BESS Alternative, with its lithium-ion technology, presents fire-related concerns that are specific to Hazard, Hazardous Materials, and Wildfire, and are addressed under that subsection above.

Solid Waste Management

The BESS Alternative would have a smaller construction footprint compared to the proposed project, which would serve to decrease the amount of solid waste generated under this alternative. However, the overall impacts to solid waste management under the BESS Alternative would remain less than significant.

Transmission Line Safety and Nuisance

There is a fundamental difference between BESS and wind turbines. Batteries store electricity, but don't produce it, while wind turbines produce electricity. While the BESS Alternative would not be a power generation facility (i.e., a wind energy facility), the EF and EMF impacts from this alternative on Transmission Line Safety and Nuisance would remain less than significant.

Transportation

With the BESS Alternative, the impacts to transportation would be similar to those of the proposed project (i.e., less than significant). The alternative would require short-term construction activities such as moving workers and construction material to the site, but at a reduced level compared to the proposed project. The project access intersections would continue to be constructed under this alternative and associated measures to make the project access intersections compliant with Caltrans design standards would be required. Long-term operations are typically not required with BESS, and therefore VMT from employee trips would not occur. VMT generation during construction of the BESS Alternative would be lower than the proposed project. Despite these reductions in VMT, the BESS Alternative would continue to have an overall less-than-significant effect on transportation.

Visual Resources

The BESS Alternative's components of greatest visual concern would be the on-site collector substation, gen-tie line, and battery storage containers. While the 8-foot-tall battery storage containers of the BESS Alternative are unlikely to be visible to the public from beyond the site due to terrain and vegetation screening, the taller components of the collector substation and gen-tie line could potentially be visible from SR-299. Of the two possible 12-acre locations for the BESS facility, Site A is the farthest location from potential public views along SR-299. However, with either site location, it is unlikely that any of the BESS Alternative's components would cause significant visual resources impacts or compromise the scenic integrity or visual quality of any landscape visible from public vantage points. Furthermore, none of the BESS Alternative's components would be tall enough to require FAA hazard lighting, and significant night lighting impacts are not anticipated under this alternative. Overall impacts to visual resources would be less than significant.

Water Resources

Compared to the propsoed proejct, the BESS Alternative would diminish the amount of ground disturbance required for construction and operation. However, stormwater management, compliance with Clean Water Act sections 404 and 405, and reliance on regional groundwater for water supply would remain necessary during construction. Overall impacts to water resources from a BESS Alternative would be less than significant with mitigation. Presumably, the BESS facility would be remotely operated with little to no staff, so water supply for a fire suppression system and minimal landscaping would be satisfied with on-site extraction.

Consumer Benefits

A BESS Alternative would likely have less local financial benefits than the proposed project due to the shorter construction period and fewer workers for construction and operations and less overall materials associated with construction. For example, the 200 MW Zeus BESS project estimates a peak construction workforce of 80 and no regular onsite staff during operations (Docket 98-AFC-07C, TN 254396 pp. 4-5). A global study

from the Lappeenranta University of Technology in Finland projected that 330,000 energy storage jobs will be created in North America by 2050, which includes research and development, manufacturing, and installation jobs (Ram et al. 2020, as cited in Martin 2020).

Under a BESS Alternative, the costs related to fire protection would likely be similar to the proposed project. As discussed in **Section 4.4, Worker Safety and Fire Protection**, the Shasta County Fire Department stations that serve the project area are not adequately staffed. Condition of Certification **WORKER SAFETY-8** would require the applicant to fund a portion of a new fire station in Montgomery Creek (i.e., $1 million in capital costs, per project, plus annual payments for staffing). Under a Battery Energy System Alternative, the shortage of fire station staffing and the need for additional emergency responder training per NFPA 855 requirements may require a similar mitigation measure or condition of certification to fund the construction and/or operation of a new fire station. As such, there may be no change in anticiapted fire protection costs under a BESS Alternative.

Impacts on Grid Reliability

Currently, no evidence in the record indicates that the region around the project has a reliability issue addressed by the project. The CAISO considers the proposed project to not be in a transmission constrained local capacity area (CAISO 2023). The applicant noted the site was selected because of access to the land and wind resources, not due to any reliability need and that the power would enter the general transmission system and not specifically serve local consumption (TN 250551). Furthermore, the Power System Benefits Report (TN 254714) for the proposed project states, "...[t]he interconnection studies performed by CAISO for the Fountain Wind Project did not identify any overloaded facilities that the Fountain Wind Project would be required to mitigate" (GridBright 2024).

The applicant indicates the expected capacity factor for the project is 26-32%. This, coupled with information from the applicant that the project is serving the grid in general, evidences that the project is not intended to contribute to local reliability or specifically address the net peak time when thousands of megawatts of solar come off the system, and other sources are needed especially in the summer between 4 p.m. and 9 p.m.

A BESS Alternative can support both the local and region wide grid reliability, because a BESS offers the CAISO a reliable dispatchable energy resource to the electrical grid, especially in net peak times (Docket 01-AFC-18C, TN 248510, pp. 2 and 9.)

A BESS also provides support for the grid and renewable generation by reducing renewable energy curtailment. According to National Renewables Energy Lab (NREL), in addition to addressing temporal mismatches between renewable energy supply and electricity demand (e.g., excess wind generation in the middle of the night) that may require renewable generators to curtail their output, a BESS can help defer or

circumvent the need for new grid investments by meeting peak demand with energy stored from lower-demand periods, thereby reducing congestion and improving overall transmission and distribution asset utilization. NREL notes that a BESS can provide fast response to a contingency such as a generator failure or some other real-time grid need (Bower et al. 2019). Table 8-8 summarizes the potential applications for BESS in the electricity system, as well as whether the application is currently valued in U.S. electricity markets.

TABLE 8-8 APPLICATIONS OF UTILITY-SCALE ENERGY STORAGE

Application	Description	Duration of Service Provision	Typically Valued in U.S. Electricity Markets?
Arbitrage	Purchasing low-cost off-peak energy and selling it during periods of high prices.	Hours	Yes
Firm Capacity	Provide reliable capacity to meet peak system demand.	4+ hours	Yes, via scarcity pricing and capacity markets, or through resource adequacy payments.
Operating Reserves			
• Primary Frequency Response	Very fast response to unpredictable variations in demand and generation.	Seconds	Yes, but only in a limited number of markets.
• Regulation	Fast response to random, unpredictable variations in demand and generation.	15 minutes to 1 hour	Yes
• Contingency Spinning	Fast response to a contingency such as a generator failure.	30 minutes to 2 hours	Yes
• Replacement/ Supplemental	Units brought online to replace spinning units.	Hours	Yes, but values are very low.
• Ramping/ Load Following	Follow longer-term (hourly) changes in electricity demand.	30 minutes to hours	Yes, but only in a limited number of markets.
Transmission and Distribution Replacement and Deferral	Reduce loading on T&D system during peak times.	Hours	Only partially, via congestion prices.
Black-Start	Units brought online to start system after a system-wide failure (blackout).	Hours	No, typically compensated through cost-of-service mechanisms.

Source: Denholm 2018, as cited in Bower et al. 2019

The BESS Alternative can be expected to provide greater flexibility to the local and regional grid by not only matching demand but more directly supporting grid reliability and use of renewable energy generation that may otherwise be curtailed.

LORS Consistency

The BESS Alternative would be consistent with the Shasta County General Plan (Policies T-b, T-c, T-g, E-d), and with Shasta County Municipal Code sections 17.08.030, 17.08.040, 17.88.100, and 17.88.335. Operation of a BESS would meet the definition of

a “public utility” set forth in municipal code section 17.02.430, which is permitted as a special use in all unincorporated county districts per code section 17.88.100.

For the above reasons, if the CEC finds the Fountain Wind Project is necessary for public convenience and necessity, the CEC may find that a BESS is a more prudent and feasible means of achieving that public convenience and necessity. Table 8-9 provides the comparison of the BESS Alternative to the proposed project.

TABLE 8-9 COMPARISON OF FOUNTAIN WIND PROJECT AND BESS ALTERNATIVE

Issue Area	Fountain Wind Project	BESS Alternative
Air Quality		
Conflict with or obstruct implementation of the applicable air quality plan	PSM	PSM
Result in a cumulatively considerable net increase of any criteria pollutant	PSM	PSM
Expose sensitive receptors to substantial pollutant concentrations	PSM	PSM
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	LS	LS
Biological Resources		
Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	SU	SM
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 Wildlife or U.S. Fish and Wildlife Service	SU	SM
Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means	SM	SM
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 wildlife nursery sites	SU	SM
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	SU	SM
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan	None	None
Climate Change and Greenhouse Gas Emissions		
Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment	LS	LS
Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions	LS	LS

TABLE 8-9 COMPARISON OF FOUNTAIN WIND PROJECT AND BESS ALTERNATIVE

Issue Area	Fountain Wind Project	BESS Alternative
Cultural and Tribal Cultural Resources		
Cause a substantial adverse change in the significance of a historical resource	SU	LS
Cause a substantial adverse change in the significance of a unique archaeological resource	PSM	PSM
Disturb human remains	PSM	PSM
Cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in California Register of Historical Resources, or in a local register	None	None
Cause a substantial adverse change in the significance of a tribal cultural resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant	SU	Unknown
Efficiency and Energy Resources		
Impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	LS	LS
Conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	LS
Forestry Resources		
Conflict with zoning for forest land or timberland	SU	LS
Conversion of forest land	SU	LS
Create other changes in the environment that contribute to loss of forest land	SM	LS
Geology, Paleontology, and Minerals		
Increase the risk of loss, injury, or death due to geologic hazard	LS	LS
Destroy a unique paleontological resource or geologic feature	LS	LS
Result in the loss of an available mineral resource	LS	LS
Hazards, Hazardous Materials, and Wildfire		
Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	SM	SM
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	SM	SM
Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	None	None
Be 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 or excessive noise for people residing or working in the project area	SM	None
Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	LS	LS

TABLE 8-9 COMPARISON OF FOUNTAIN WIND PROJECT AND BESS ALTERNATIVE

Issue Area	Fountain Wind Project	BESS Alternative
Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires	SM	SM
Substantially impair an adopted emergency response plan or emergency evacuation plan in a very high fire hazard severity zones	PSU	LS
Exacerbate wildfire risks and expose project occupants and the public in nearby communities to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire	SM	SM
Project infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or may result in temporary or ongoing impacts to the environment	SM	SM
Expose people or structures to downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes	SM	SM
Land Use and Agriculture		
Create a conflict with an established land use	LS	LS
Conflict with local land use plans, policies, or regulations	SU	None
Conflict with agricultural zoning	SU	None
Noise and Vibration		
Generation of a substantial increase in ambient noise levels	PSM	PSM
Generation of excessive groundborne vibration levels	LS	LS
Public Health		
Expose sensitive receptors to substantial pollutant concentrations or result in other public health impact	LS	LS
Socioeconomics		
Induce unplanned population growth or displace people or housing	LS	LS
Impact the public services in Shasta County, including fire and police protection, schools, parks and recreational facilities or other public facilities	LS	LS
Solid Waste Management		
Generate solid waste in excess of the capacity of local infrastructure	LS	LS
Transmission Line Safety and Nuisance		
Electric Field and Electro Magnetic Field	LS	LS
Transportation		
Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities	LS	LS
Conflict or be inconsistent with CEQA Guidelines, section 15064.3, subdivision (b)	LS	LS
Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	PSM	PSM

TABLE 8-9 COMPARISON OF FOUNTAIN WIND PROJECT AND BESS ALTERNATIVE

Issue Area	Fountain Wind Project	BESS Alternative
Result in inadequate emergency access	LS	LS
Visual Resources		
Substantially degrade landscape integrity and visual quality	SU	LS
Create a new source of night lighting	SM	None
Water Resources		
Violate water quality standards or waste discharge requirements	PSM	PSM
Decrease groundwater supplies	PSM	PSM
Substantially alter the existing drainage pattern of the site	PSM/LS	LS
Have sufficient water supplies	PSM	PSM
On-site waste-water treatment	PSM	None
LORS Consistency	Inconsistent	Consistent

Notes:
The following impact conclusions correspond to impact determinations of the Fountain Wind Project, as provided within each environmental analysis section of this EIR:

None = No impact
Beneficial = Beneficial impact
Unknown = Significance of impact is unknown
LS = Less than significant impact, no mitigation required
SM or PSM = Significant/Potentially significant impact that can be mitigated to less than significant
SU or PSU = Significant/Unavoidable or Potentially significant/Unavoidable impact that cannot be mitigated to less than significant

8.8 Environmentally Superior Alternative

In accordance with CEQA requirements, an "environmentally superior alternative" must be identified among the alternatives analyzed in an EIR. The environmentally superior alternative is the alternative found to have an overall environmental advantage compared to the other alternatives based on the impact analysis in the EIR. If the environmentally superior alternative is the No Project alternative, CEQA Guidelines Section 15126.6(e)(2) requires the EIR to identify an environmentally superior alternative from among the other alternatives.

In evaluating the anticipated environmental impacts of the proposed project and alternatives, staff has determined that the No Project Alternative would have the least environmental effects. However, the No Project Alternative would not meet the objectives of the project to assist California in reaching the renewable energy generation or zero carbon emission targets set forth in SB 100. Therefore, staff has identified an environmentally superior alternative from among the action alternatives.

The BESS Alternative was expressly developed to avoid or substantially lessen significant effects of the proposed project while achieving the project's objective of contributing to the State's zero carbon targets identified in SB 100. As discussed in

subsection 8.7.3, battery storage was identified in the 2021 SB 100 Joint Agency Report as a key factor for improving load flexibility within the State's transmission system. A BESS Alternative has an additional advantage of not being limited solely to the proposed project site. It could be suitable for multiple sites within the wider region. For example, it could be used for managing transmission congestion at a substation site or for integrating an intermittent generation resource into the transmission grid at a co-generation facility. Furthermore, a BESS Alternative would be feasible as there are currently three battery storage projects proposed within Shasta County that would connect to the Northern California electrical grid (see Table 8-7).

While development of a BESS facility would result in temporary and permanent effects from construction and operation activities, the acreage of disturbance from this alternative is greatly reduced when compared to the proposed project. This smaller project footprint would result in less severe impacts for the following issues areas: Biological Resources; Cultural Resources; Forestry Resources; Hazards, Hazardous Materials, and Wildfire; Land Use and Agriculture; Visual Resources; and Water Resources. A BESS Alternative would also avoid the proposed project's significant and unavoidable impacts for four issue areas (Biological Resources, Forestry Resources, Land Use and Agriculture, and Visual Resources). It would also be consistent with State and local LORS. Compared to the proposed project, this alternative would have less intrusive effects on the Montgomery-Hatchet Creek Tribal Cultural Landscape, although the overall severity of these effects remains unknown pending input from the Pit River Tribe. All other potentially significant impacts would be mitigable under the BESS Alternative through the adoption of conditions of certification identified by staff.

The BESS Alternative would reduce the severity of many of the proposed project's impacts. Furthermore, it would avoid the proposed project's significant and unavoidable impacts in four issue areas, and it would be consistent with State and local LORS. Therefore, staff have identified the BESS Alternative as the CEQA Environmentally Superior Alternative.

8.9 References

Arthur 2023 – Arthur, Damon (Arthur). Shasta County to get 'clean' power plant north of Burney. Record Searchlight. Dated April 19, 2023. Accessed on December 7, 2023. Accessed online at: https://www.redding.com/story/news/2023/04/19/construction-begins-on-a-new-power-plant-unique-to-shasta-county/70128371007/

Bowen et al. 2019 – Bowen, T., Chernyakhovskiy, I., and Denholm, P. (Bowen et al.). Grid-Scale Battery Storage Frequently Asked Questions. Greening the Grid. National Renewable Energy Laboratory. Dated September 2019. Accessed on February 28, 2024. Accessed online at: https://www.nrel.gov/docs/fy19osti/74426.pdf

CAISO 2024 – California Independent System Operator (CAISO). Cluster 15 Interconnection Requests. Dated January 3, 2024. Accessed on January 11,

2024. Accessed online at: https://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx

CAISO 2023 – California Independent System Operator (CAISO). 2025 Local Capacity Area Technical Study, Final. Dated November 30, 2023. Accessed on February 28, 2024. Accessed online at: http://www.caiso.com/InitiativeDocuments/FinalStudyManual-2025LocalCapacityRequirements.pdf

Caltrans 2019 – California Department of Transportation (Caltrans). List of eligible and officially designated State Scenic Highways. Dated August 2019. Accessed on February 23, 2024. Accessed online at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways

CDFW 2023 – California Department of Fish and Wildlife (CDFW). TN 253469. Docket: 23-OPT-01. Department of Fish and Wildlife Comments - CEQA-2017-0312_2023110139_SHA_CEC_Fountain Wind Project_NOP_Ltr. Dated December 1, 2023. Accessed on December 18, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CDPR 2019 – California Department of Parks and Recreation (CDPR). Draft Environmental Impact Report for the Gonzaga Ridge Wind Repowering Project. SCH 2018101047. Prepared by Dudek. Dated October 2019. Accessed on March 28, 2024. Accessed online at: https://ceqanet.opr.ca.gov/2018101047/2

CEC 2024a – California Energy Commission (CEC). California Energy Storage System Survey. Accessed on February 26, 2024. Accessed online at: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-storage-system-survey

CEC 2024b – California Energy Commission (CEC). Quarterly Fuel and Energy Report Data Tables. Accessed on March 5, 2024. Accessed online at: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/quarterly-fuel-and-energy-report-qfer-0

CEC 2023a – California Energy Commission (CEC). TN 248742. Docket: 23-OPT-01. Deficiency letter. Dated February 10, 2023. Accessed on February 13, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2023b – California Energy Commission (CEC). TN 248759. Docket: 23-OPT-01. Deficiency Letter, Attachment B Addendum. Dated February 10, 2023. Accessed on February 13, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2023c – California Energy Commission (CEC). TN 252898. Docket: 23-OPT-01. Notice of Preparation of a Draft Environmental Impact Report. Dated November 2, 2023. Accessed on November 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2023d – California Energy Commission (CEC). Docket: 23-OPT-01. Docket Log for the Fountain Wind Project. Opened on January 3, 2023. Accessed on January 2023 through February 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2023e – California Energy Commission (CEC). TN 249906. Docket: 17-MISC-01. Energy Commission Report on AB 525 Offshore Wind Permitting Roadmap. Dated April 28, 2023. Accessed on December 11, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=17-MISC-01

CEC 2023f – California Energy Commission (CEC). TN 252354. Docket: 21-SIT-01. Final Land-Use Screens Staff Report (UPDATED). Dated September 22, 2023. Accessed on December 13, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-SIT-01

CEC 2023g – California Energy Commission (CEC). CEC 2023 Land-Use Screens for Electric System Planning. Data last updated July 18, 2023. Accessed on December 13, 2023. Accessed online at: https://www.energy.ca.gov/data-reports/california-energy-planning-library/land-use-screens/cec-2023-land-use-screens-electric

CEC 2023h – California Energy Commission (CEC). California Electric Infrastructure App. Published date December 27, 2017. Data updated July 21, 2023. Accessed on December 14, 2023. Accessed online at: https://cecgis-caenergy.opendata.arcgis.com/pages/web-mapping-applications

CEC 2022a – California Energy Commission (CEC). Offshore Wind Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045. Publication Number: CEC-800-2022-001-REV. Dated August 2022. Accessed on December 11, 2023. Accessed online at: www.energy.ca.gov/filebrowser/download/4361

CEC 2022b – California Energy Commission (CEC). 3-D Interactive Visualization of California Wind Generators. Data last updated December 7, 2022. Accessed on February 26, 2024. Accessed online at: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/3-d-interactive-visualization-california

CEC 2021a – California Energy Commission (CEC). TN 237167. Docket: 19-SB-100. 2021 SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future. Dated March 15, 2021. Accessed on November 27, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-SB-100

CEC 2021b – California Energy Commission (CEC). Report to the Governor on Priority SB 100 Actions to Accelerate the Transition to Carbon-Free Energy. CEC-200-2021-008. Dated September 2021. Accessed on November 27, 2023. Accessed online at: https://www.energy.ca.gov/sites/default/files/2021-09/CEC-200-2021-008.pdf

CEC 2019 – California Energy Commission (CEC). Staff Report. "Estimated Cost of New Utility-Scale Generation in California: 2018 Update." CEC-200-2019-500. May. Accessed on: January 12, 2024. Accessed online at: https://www.energy.ca.gov/sites/default/files/2021-06/CEC-200-2019-005.pdf

CEC 2018 – California Energy Commission (CEC). California Energy Commission-Tracking Progress Report: Energy Efficiency. Last updated September 2018. Accessed on December 14, 2023. Accessed online at: https://www.energy.ca.gov/sites/default/files/2019-12/energy_efficiency_ada.pdf

City of Commerce 2022 – City of Commerce (City of Commerce). Commerce Energy Storage Project Initial Study and Mitigated Negative Declaration. Prepared by TRC. Dated April 2022. Accessed on February 27, 2024. Accessed online at: https://files.ceqanet.opr.ca.gov/277992-1/attachment/o_VhiTWYPAAHt5t2qxPFaePG29UW_0rLeGtwRF19zcNB4WFcK_gJAisbvGcngNKDIKleh5mdLKOqlhHJ0

City of Grand Terrace 2021 – City of Grand Terrace (City of Grand Terrace). Condor Battery Energy Storage Facility Initial Study and Mitigated Negative Declaration. Prepared by MIG, Inc. Dated October 13, 2021. Accessed on February 27, 2024. Accessed online at: https://files.ceqanet.opr.ca.gov/273469-1/attachment/JDX3uKHXDeBlGND_AoeF57Nu76NBwWAJBpmn865RCNJiKjpOm8lzjh0am5nbr-uug29UZz33VWPV7bEH0

County of Monterey 2019 – County of Monterey (County of Monterey). Elkhorn Battery Energy Storage Facility Initial Study and Mitigated Negative Declaration. Dated July 3, 2019. Accessed on February 27, 2024. Accessed online at: https://files.ceqanet.opr.ca.gov/252916-2/attachment/cFUVBHWibQn3_v8ftWmvzuzHh6VmXSw2dEyjl_mbtKXtVQ6dRXrrX15nLYCLZUf_-SrEvpUR8xMo35Ap0

County of San Diego 2023 – County of San Diego (County of San Diego). Notice of Preparation and Public Scoping Meeting for a Draft Environmental Impact Report for the Seguro Storage Project. Dated October 26, 2023. Accessed on February 21, 2024. Accessed online at: https://www.sandiegocounty.gov/pds/ceqa/MUP-23-012.html

County of San Diego 2020 – County of San Diego (County of San Diego). Valley Center Energy Storage Statement of Reasons for Exemption from Additional Environmental Review and 15183 Checklist. Dated August 27, 2020. Accessed on February 21, 2024. Accessed online at: https://www.sandiegocounty.gov/pds/ceqa/STP-20-011.html

DOC 2023a – California Department of Conservation (DOC). California Important Farmland Finder. Updated 2020. Accessed on December 13, 2023. Accessed online at: https://www.conservation.ca.gov/dlrp/fmmp

DOC 2023b – California Department of Conservation (DOC). California Williamson Act Enrollment Finder. Data reported by Tehama County for Enrollment Year 2022.

Accessed on December 13, 2023. Accessed online at: https://www.conservation.ca.gov/dlrp/wa/Pages/stats_reports.aspx

EIA 2024 – U.S. Energy Information Administration (EIA). Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies. Dated January 2024. Accessed on February 21, 2024. Accessed online at: https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2025.pdf

ESA 2020 – Environmental Science Associates (ESA). TN 248288-9. Docket: 23-OPT-01. Fountain Wind Project Draft Environmental Impact Report: Section 3.7 Energy. Prepared for Shasta County Department of Resource Management Planning Division. Dated July 2020. Accessed on March 1, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

ESA 2019 – Environmental Science Associates (ESA). Fountain Wind Project Scoping Report. Prepared for Shasta County Department of Resource Management Planning Division. Dated March 20, 2019. Accessed on December 5, 2023. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/3360/_fountain-wind-scoping-report_with-appendicies.pdf

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

GAO 2023 – United States Government Accountability Office (GAO). Report to Congressional Addressees. Technology Assessment Utility-Scale Energy Storage. GAO-23-105583. Dated March 2023. Accessed on November 28, 2023. Accessed online at: https://www.gao.gov/assets/gao-23-105583.pdf

GridBright 2024 – GridBright (GridBright). TN 254714. Docket: 23-OPT-01. Fountain Wind Project Power System Benefits Report. Dated February 20, 2024. Accessed on February 29, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Imperial County 2021a – Imperial County Planning and Development Services (Imperial County). Westside Canal Battery Storage Project Final Environmental Impact Report. Prepared by Stantec Consulting Service, Inc. Dated July 27, 2021. Accessed on February 27, 2024. Accessed online at: https://www.icpds.com/assets/Westside-Canal-Battery-Storage-FEIR-with-Findings-----1653586638.pdf

Imperial County 2021b – Imperial County (Imperial County). Westside Canal Battery Storage Project Draft Environmental Impact Report. Prepared by Stantec Consulting Service, Inc. Dated April 7, 2021. Accessed on February 27, 2024. Accessed online at: https://www.icpds.com/assets/Westside_Battery_Public_Draft-EIR.pdf

Jacobs 2020 – Jacobs Engineering Group, Inc. (Jacobs). Summit Wind Repower Project Affected Environmental Analysis Update, Final. Prepared for Alameda County Planning Department. Dated April 2020. Accessed on March 28, 2024. Accessed online at: https://www.acgov.org/cda/planning/landuseprojects/documents/SummitWindPDUpdate-AEAUFinal4-28-20.pdf

Jefferson Resource Company 2023 – Jefferson Resource Company, Inc (Jefferson Resource Company). TN 251438. Docket: 23-OPT-01. fwp_LU-001_FountainWind_timber_analysis. Dated July 31, 2023. Accessed on August 22, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Martin 2020 – Jose Rojo Martin (Martin). Study: PV, storage poised to become top energy job creators by mid-century. PVTech. Dated January 22, 2020. Accessed on February 28, 2024. Accessed online at: https://www.pv-tech.org/study-pv-storage-poised-to-become-top-energy-job-creators-by-mid-century/

MRP SJE 2024 – Middle River Power San Joaquin Energy LLC (MRP SJE). TN 254396. Docket: 08-AFC-07C. Petition for Post-Certification Amendment, Tracy Combined Cycle Power Plant, Zeus 200 MW Battery Energy Storage System Project. Dated February 2024. Accessed on February 27, 2024. Accessed online at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=254396&DocumentContentId=89783

Ram et al. 2020 – Ram, M., Aghahosseini, A., and Breyer, C. (Ram et al.). Job creation during the global energy transition towards 100% renewable power system by 2050. Technological Forecasting and Social Change. Volume 151, February 2020, 119682. Accessed on February 28, 2024. Accessed online at: https://doi.org/10.1016/j.techfore.2019.06.008

Sargent & Lundy 2024 – Sargent & Lundy, LLC (Sargent & Lundy). Summit Wind Farm. Accessed on March 28, 2024. Accessed online at: https://sargentlundy.com/projects/summit-wind-farm/

Shasta County 2024 – Shasta County (Shasta County). TN 260101. Docket: 23-OPT-01. County of Shasta Comments on Wildfire, Economics, and Various Project Environmental Issues. Dated November 15, 2024. Accessed on November 21, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2023a – Shasta County (Shasta County). Shasta County Code. Codified through Ordinance No. 2023-05. Updated September 25, 2023. Accessed on December 15, 2023. Accessed online at: https://www.shastacounty.gov/planning

Shasta County 2023b – Shasta County (Shasta County). Shasta County Map Viewer. Updated October 15, 2023. Accessed on December 19, 2023. Accessed online at: https://www.shastacounty.gov/information-technology/page/geographic-information-systems-gis-division

Shasta County 2022 – Shasta County (Shasta County). County of Shasta Adopted Budget Fiscal Year 2022-2023. Dated June 14, 2022. Accessed on February 28, 2024. Accessed online at: https://www.shastacounty.gov/sites/default/files/filefield_paths/final-adopted_budget_book_fy2223.pdf

Shasta County 2020a – Shasta County Department of Resource Management Planning Division (Shasta County). TN 248288-1. Docket: 23-OPT-01. DEIR Comparison of Alternatives. Dated July 2020. Accessed on April 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2020b – Shasta County Department of Resource Management Planning Division (Shasta County). TN 248288-2. Docket: 23-OPT-01. DEIR Description of Project and Alternatives. Dated July 2020. Accessed on April 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Shasta County 2004. Shasta County (Shasta County). Shasta County General Plan. Amended through September 2004. Accessed on December 19, 2023. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan

SMUD 2023 – Sacramento Municipal Utility District (SMUD). SMUD begins construction on Solano 4 Wind Project. Dated April 19, 2023. Accessed on March 28, 2024. Accessed online at: https://www.smud.org/en/Corporate/About-us/News-and-Media/2023/2023/SMUD-begins-construction-on-Solano-4-Wind-Project

SMUD 2022 – Sacramento Municipal Utility District (SMUD). Accelerating decarbonization, ESS, Inc. and SMUD announce agreement for long-duration energy storage solutions. Dated September 20, 2022. Accessed on November 28, 2023. Accessed online at: https://www.smud.org/en/Corporate/About-us/News-and-Media/2022/2022/Accelerating-decarbonization-ESS-Inc-and-SMUD-announce-agreement-for-long-duration-energy-storage

Stantec 2023a – Stantec Consulting Services, Inc. (Stantec). TN 250551. Docket: 23-OPT-01. ALT-01_02_fwp_site_selection_and_proj_obj. Dated June 8, 2023. Accessed on June 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023b – Stantec Consulting Services, Inc. (Stantec). TN 250553. Docket: 23-OPT-01. ALT-01_02_fwp_responses. Dated June 8, 2023. Accessed on June 12, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023c – Stantec Consulting Services, Inc. (Stantec). TN 250956. Docket: 23-OPT-01. fwp_misc_responses_2023-0706. Dated July 6, 2023. Accessed on July 10, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023d – Stantec Consulting Services, Inc. (Stantec). TN 251462. Docket: 23-OPT-01. fwp_memo_lu_soc_alts_2023-0802. Dated August 2, 2023. Accessed on

August 7, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023e – Stantec Consulting Services, Inc. (Stantec). TN 250835. Docket:23-OPT-01. fwp_file_submittal_memo_2023-0629_gis. Dated June 29, 2023. Accessed on July 7, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stauffer 2023 – Stauffer, Nancy W. (Stauffer). Flow batteries for grid-scale energy storage. MIT News. Dated April 7, 2023. Accessed on November 28, 2023. Accessed online at: https://news.mit.edu/2023/flow-batteries-grid-scale-energy-storage-0407

Tehama County 2024a – Tehama County (Tehama County). Tehama County Zoning Portal. Accessed on February 23, 2024. Accessed online at: https://www.co.tehama.ca.us/government/departments/planning-department/

Tehama County 2024b – Tehama County (Tehama County). Tehama County Municipal Code. Updated February 14, 2024. Accessed on February 23, 2024. Accessed online at: https://www.co.tehama.ca.us/government/departments/planning-department/zoning-information/

Twitchell et al. 2023 – Twitchell, Jeremy B., Powell, Devyn W., and Paiss, Matthew D. (Twitchell et al.). Energy Storage in Local Zoning Ordinances. Pacific Northwest National Laboratory. PNNL-34462. Dated October 2023. Accessed on November 28, 2023. Accessed online at: https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-34462.pdf

USFWS 2023 – U.S. Fish and Wildlife Service (USFWS). National Wetlands Inventory. Updated October 23, 2023. Accessed March 7, 2024. Accessed online at: https://www.fws.gov/program/national-wetlands-inventory/data-download

Vahle 2023 – Vahle, Elise (Vahle). How Much Does Commercial Energy Storage Cost? Energy Link LLC. Dated April 27, 2023. Accessed on February 26, 2024. Accessed online at: https://goenergylink.com/blog/how-much-does-commercial-energy-storage-cost/

Vistra 2023 – Vistra Corp. (Vistra). Vistra Completes Milestone Expansion of Flagship California Energy Storage System. Dated August 1, 2023. Accessed on February 26, 2024. Accessed online at: https://investor.vistracorp.com/2023-08-01-Vistra-Completes-Milestone-Expansion-of-Flagship-California-Energy-Storage-System

Section 9

Compliance Conditions and Compliance Monitoring Plan

9 Compliance Conditions and Compliance Monitoring Plan

9.1 Introduction

The Fountain Wind Project (Fountain Wind or project), Compliance COCs (COC's), including a Compliance Monitoring Plan (Compliance Plan), are established as required by Public Resources Code section 25545.11. The Compliance Plan provides a means for assuring that the facility is constructed, operated, and closed in compliance with public health and safety and environmental law; all other applicable laws, ordinances, regulations, and standards (LORS); and the conditions adopted by the California CEC (CEC) Final Decision (Decision) on the project's Opt-in Application (OPT), or otherwise required by law.

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of the compliance project manager (CPM), the project owner or operator, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all CEC-approved COC's;
- establish contingency planning, facility non-operation protocols, and closure requirements; and
- establish a tracking method for the technical area COC's that contain measures required to mitigate potentially adverse project impacts associated with construction, operation, and closure below a level of significance; each technical COC also includes one or more verification provisions that describe the means of assuring that the condition has been satisfied.

9.2 Key Project Event Definitions

The following terms and definitions help determine when various COCs are implemented.

Project Certification

Project certification occurs upon CEC approving an order certifying the project at a Business Meeting or hearing. At that time, all CEC COCs become binding on the project owner and the proposed facility. Also at that time, the project enters the compliance phase. It retains the same docket number it had during its siting review, but the letter

"C" is added at the end (for example, 19-OPT-8C) to differentiate the compliance phase activities from those of the certification proceeding.

Site Assessment and Pre-Construction Activities

The below-listed site assessment and pre-construction activities may be initiated or completed prior to the start of construction, subject to the CPM's approval of the specific site assessment or pre-construction activities.

Site assessment and pre-construction activities include the following, but only to the extent the activities are minimally disruptive to soil and vegetation and will not affect listed or special-status species or other sensitive resources:

1. the installation of environmental monitoring equipment;
2. a minimally invasive soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility;
5. any minimally invasive work to provide safe access to the site for any of the purposes specified in 1 through 4, above; and
6. removal of small surface structures and equipment that is minimally invasive such as sheds, trailers, and similar sized structures.

Site Mobilization and Construction

When a condition of certification requires the project owner to take an action or obtain CPM approval prior to the start of construction, or within a period of time relative to the start of construction, that action must be taken, or approval must be obtained, prior to any site mobilization or construction activities, as defined below.

Site mobilization and construction activities are those necessary to provide site access for construction mobilization and facility installation, including both temporary and permanent equipment and structures, as determined by the CPM.

Site mobilization and construction activities include, but are not limited to:

1. ground disturbance activities like grading, boring, trenching, leveling, mechanical clearing, grubbing, and scraping;
2. site preparation activities, such as access roads, temporary fencing, trailer and utility installation, construction equipment installation and storage, equipment and supply laydown areas, borrow and fill sites, temporary parking facilities, chemical spraying, and controlled burns; and
3. permanent installation activities for all facility and linear structures, including access roads, fencing, utilities, parking facilities, equipment storage, mitigation and landscaping activities, and other installations, as applicable.

Commissioning

Commissioning activities test the functionality of the installed components and systems to ensure the facility operates safely and reliably. Commissioning provides a multistage, integrated, and disciplined approach to testing, calibrating, and proving all of the project's systems, software, and networks. For compliance monitoring purposes, examples of commissioning activities include interface connection and utility pre-testing, "cold" and "hot" electrical testing, and grid synchronization.

Start of Commercial Operation

For compliance monitoring purposes, "commercial operation" or "operation" begins once commissioning activities are complete, the certificate of occupancy has been issued, and the power plant has reached reliable steady-state electrical production. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager. Operation activities can include a steady state of electrical production, or, for "deployable battery energy storage systems," a seasonal or on-demand operational regime to meet peak load demands.

Non-Operation and Closure

Non-operation is time-limited and can encompass part or all of a facility. Non-operation can be a planned event, usually for equipment maintenance or repair, or unplanned, usually the result of unanticipated events or emergencies.

Closure is a facility shutdown with no intent to restart operation. It may also be the cumulative result of unsuccessful efforts to re-start over an increasingly lengthy period of non-operation. Facility closures can occur due to a variety of factors, including, but not limited to, irreparable damage and/or functional or economic obsolescence.

9.3 Roles and Responsibilities

Provided below is a generalized description of the compliance roles and responsibilities for CEC staff (staff) and the project owner for the construction and operation of the project.

Compliance Project Manager Responsibilities

The CPM's compliance monitoring and project oversight responsibilities include:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Decision;
2. resolving complaints;
3. processing post-certification project amendments for changes to the project description, COCs and ownership or operational control, and requests for extension of the deadline for the start of construction (see **COM-10** for instructions on filing a Petition to Amend (PTA) or to extend a construction start date);

4. documenting and tracking compliance filings; and
5. ensuring that the compliance files are maintained and accessible.

The CPM is the central contact person for the CEC during project preconstruction, construction, operation, emergency response, and closure. The CPM will consult with the appropriate responsible parties when handling compliance issues, disputes, complaints, and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal requires CPM approval required by a condition of certification, the approval will involve appropriate CEC staff and management. All submittals must include searchable electronic versions (.pdf, MS Word, or equivalent files).

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. These meetings are used to assist the CEC and the project owner's technical staff in the status review of all required pre-construction or pre-operation COCs and facilitate staff taking proper action if outstanding conditions remain. In addition, these meetings shall ensure, to the extent possible, that CEC's COCs do not delay the construction and operation of the plant due to last-minute unforeseen issues, or a compliance oversight. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes or exchanging information regarding the project's pre-construction.

Energy Commission Record

The CEC maintains the following documents and information as public records, in either the Compliance file or Dockets Unit files, for the life of the project (or other period as specified):

1. all documents demonstrating compliance with any legal requirements relating to the construction, operation, and closure of the facility;
2. all Monthly and Annual Compliance Reports (MCRs, ACRs) and other required periodic compliance reports (PCRs) filed by the project owner;
3. all project-related complaints of alleged noncompliance filed by the CEC; and
4. all petitions for project or condition of certification changes and the resulting action by staff or the CEC.

Chief Building Official Delegation and Agency Cooperation

Public Resources Code section 25532 requires the CEC to establish a monitoring system to assure that any facility it certifies is constructed and operated in a manner consistent with law and the CEC's Decision. In carrying out these responsibilities through monitoring construction and operation of the project, the CEC has the responsibilities of

the chief building official (CBO) consistent with Health and Safety Code section 18949.27 and Title 24, part 2, section 104 (commonly referred to as the California Building Code, or CBC). Staff may delegate some CBO responsibility to either an independent third-party contractor or a local building official, as per section 103.3 of part 2 of the CBC. However, staff retains CBO authority when selecting a delegate CBO (DCBO), including the interpretation and enforcement of state and local codes, and the use of discretion, as necessary, in implementing the various codes and standards. (See section 104.1 of part 2 of the CBC).

The DCBO will be responsible for the implementation of all appropriate codes, standards, and CEC requirements. The DCBO will conduct on-site (including linear facilities) reviews and inspections at intervals necessary to fulfill these responsibilities. The project owner will pay all DCBO fees necessary to cover the costs of these reviews and inspections.

Project Owner Responsibilities

Should the project be approved, the project owner is responsible for ensuring that all COCs and applicable LORS in the project Decision are satisfied. The project owner will submit all compliance submittals to the CPM for processing unless the conditions specify another recipient. The Compliance conditions regarding post-certification changes specify measures that the project owner must take when modifying the project's design, operation, or performance requirements, or to transfer ownership or operational control. Failure to comply with any of the COCs or applicable LORS may result in a non-compliance report, an administrative fine, certification revocation, or any combination thereof, as appropriate.

9.4 Compliance Enforcement

The CEC's legal authority to enforce the terms and conditions of its Decision are specified in Public Resources Code sections 25545.11 and 25900. The CEC may amend or revoke a project certification and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Decision. The CEC's actions and fine assessments would take into account the specific circumstances of the incident(s).

Periodic Compliance Reporting

Many of the COCs require submittals in the MCRs and ACRs. All compliance submittals assist the CPM in tracking project activities and monitoring compliance with the terms and conditions of the project Decision. During construction, the project owner or an authorized agent will submit compliance reports on a monthly basis. During operation, compliance reports are submitted annually; though reports regarding compliance with various technical area COCs may be required more often (e.g. Biological Resources), and if the project is operating with a temporary permit to occupy. Further detail regarding the MCR/ACR content and the requirements for an accompanying compliance matrix are described below.

Investigation Requests and Complaint Procedures

Any person may file a Request for Investigation alleging noncompliance with the COCs, CEC regulations, or orders. Such a request shall be filed with and reviewed by the Executive Director. The provisions setting forth the Request for Investigation process can be found in Title 20, California Code of Regulations, sections 1230 through 1232.5. The Request for Investigation may result in the Executive Director bringing a complaint against the alleged violator under section 1233 and seeking administrative penalties. The California Office of Administrative Law provides on-line access to the California Code of Regulations at http://www.oal.ca.gov/.

9.5 Post-Certification Changes to the Energy Commission Decision

The project owner must petition the CEC pursuant to Title 20, California Code of Regulations, section 1882, to amend the Final Commission Decision in order to modify the design, operation, or performance requirements of the project and/or the linear facilities, or to transfer ownership or operational control of the facility. It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1882 and the CPM will determine whether staff approval will be sufficient, or whether CEC approval will be necessary.

A project owner is required to submit a $5,000 dollar fee for every petition to amend the license for a previously certified facility, pursuant to Public Resources Code section 25806(e). If the actual amendment processing costs exceed $5,000.00, the total PTA reimbursement fees owed by a project owner will not exceed the maximum filing fee OPT, which is $1,068,853 adjusted annually. Current amounts for PTA fees are available at http://www.energy.ca.gov/siting/filing_fees.html. Implementation of a project modification without first securing CEC approval may result in an enforcement action including civil penalties in accordance with Public Resources Code, section 25545.11.

Below is a summary of the criteria for determining the type of approval process required, reflecting the provisions of Title 20, California Code of Regulations, section 1882 at the time this compliance plan was drafted. If the CEC modifies this regulation, the language in effect at the time of the requested change shall apply. Upon request, the CPM can provide sample formats of these submittals.

Changes to the Design, Operation or Performance of the Project

The project owner shall submit a Petition to Amend the CEC Decision, pursuant to Title 20, California Code of Regulations, section 1882 (b), when proposing changes to the design, operation, or performance requirements of the project and/or the linear facilities. All project changes that do not require the preparation of a subsequent or supplemental environmental impact report as set forth in California Code of Regulations, title 14, sections 15162 and 15163 are subject to staff approval. Project changes that do require the preparation of a subsequent or supplemental environmental impact report shall be submitted to the CEC for consideration.

A decision by staff to approve a project change is subject to a 14-day public comment period where one may object to staff being able to approve a project change. Any such objection must make a showing supported by facts that the change does not meet the criteria for a staff approved change. Speculation, argument, conjecture, and unsupported conclusions or opinions are not sufficient to support an objection to staff approval.

If there is a valid objection to a staff action, the petition must be considered by the CEC at a publicly noticed meeting.

Change of Ownership and/or Operational Control

Changes of ownership or operational control shall be approved by staff. Upon approval, the new owner/operator is obligated to follow all project conditions of certification and applicable laws. Failure to do so subjects the new owner/operator to enforcement actions and civil penalties under Public Resources Code section 25534.

9.6 Emergency Response Contingency Planning and Incident Reporting

To protect public health and safety and environmental quality, the COC's include contingency planning and incident reporting requirements to ensure compliance with necessary health and safety practices. A well-drafted contingency plan avoids or limits potential hazards and impacts resulting from serious incidents involving personal injury, hazardous spills, flood, fire, explosions, or other catastrophic events and ensures a comprehensive timely response. All such incidents must be reported immediately to the CPM and documented. These requirements are designed to protect the public, build from "lessons learned," limit the hazards and impacts, anticipate and prevent recurrence, and provide for the safe and secure shutdown and restart of the facility.

9.7 Facility Closure and Certification Termination

The CEC cannot reasonably foresee all potential circumstances in existence when a facility permanently closes. Therefore, the closure conditions provided herein strive for the flexibility to address circumstances that may exist at some future time. Most importantly, facility closure must be consistent with all applicable CEC COCs and the LORS in effect at that time.

Prior to submittal of the facility's Final Closure Plan to the CEC for approval, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan's approval, the CPM will hold one or more workshops and/or the CEC may hold public hearings as part of its approval procedure.

With the exception of measures to eliminate any immediate threats to public health and safety or to the environment, facility closure activities cannot be initiated until the CEC approves the Final Closure Plan and Cost Estimate, and the project owner complies with

any requirements the CEC may incorporate as conditions of approval of the Final Closure Plan.

Upon approving the project owner's final closure plan, the CEC may direct that the facility's certification be terminated at the time staff finds the closure process contained in the plan has been completed.

9.8 Compliance Conditions of Certification

COM-1 Unrestricted Access. The project owner shall take all steps necessary to ensure that the CPM, responsible CEC staff, and delegate agencies or consultants, have unrestricted access to the facility site, related facilities, project-related staff, and the records maintained on site for the purpose of conducting audits, surveys, inspections, or general or closure-related site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time, whether such visits are by the CPM in person or through representatives from CEC staff, delegated agencies, or consultants.

COM-2 Compliance Record. The project owner shall maintain electronic copies of all project files and submittals accessible on site, or at an alternative site approved by the CPM, for the operational life and closure of the project. The files shall also contain at least one hard copy of:

1. the facility's Opt-In Application;
2. all amendment petitions and CEC orders;
3. all site-related environmental impact and survey documentation;
4. all appraisals, assessments, and studies for the project;
5. all finalized original and amended structural plans and "as-built" drawings for the entire project;
6. all citations, warnings, violations, or corrective actions applicable to the project, and
7. the most current versions of any plans, manuals, and training documentation required by the COCs or applicable LORS.

The CEC staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition which includes electronic submission of records to the CEC.

COM-3 Compliance Verification Submittals. Verification lead times associated with the start of construction may require the project owner to file submittals during application or amendment processing, particularly if construction is planned to commence shortly after certification. The verification procedures may be modified as necessary by the CPM after notice to the project owner.

A cover letter from the project owner or an authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. The cover letter subject line shall identify the project by docket number, cite the appropriate condition of certification number(s), and give a brief description of the subject of the submittal. When submitting supplementary or corrected information, the project owner shall reference the date of the submittal and the condition(s) of certification applicable.

All reports and plans required by the project's COCs shall be submitted in a searchable electronic format (.pdf, MS Word or Excel, etc.) and include standard formatting elements such as a table of contents identifying by title and page number each section, table, graphic, exhibit, or addendum. All report and/or plan graphics and maps shall be adequately scaled and shall include a key with descriptive labels, directional headings, a bar scale, and the most recent revision date.

The project owner is responsible for the content and delivery of all verification submittals to the CPM showing that the actions required by the verification were satisfied by the project owner or an agent of the project owner. All submittals shall be submitted electronically by email.

COM-4 Pre-Construction Matrix and Tasks Prior to Start of Construction. Prior to construction, the project owner shall submit to the CPM a compliance matrix including only those conditions that must be fulfilled before the start of construction. The matrix shall be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first, and shall be submitted in a format similar to the description below.

Site mobilization and construction activities shall not start until the following have occurred:

1. the project owner has submitted the pre-construction matrix and all compliance verifications pertaining to pre-construction COCs; and
2. the CPM has issued an authorization-to-construct letter to the project owner.

The deadlines for submitting various compliance verifications to the CPM allow staff sufficient time to review and comment on, and, if necessary, also allow the project owner to revise the submittal in a timely manner. These procedures help ensure that project construction proceeds according to schedule. Failure to submit required compliance documents by the specified deadlines may result in delayed authorizations to commence various stages of the project.

If the project owner anticipates site mobilization immediately following project certification, it may be necessary for the project owner to file compliance submittals prior to project certification. In these instances, compliance verifications can be submitted in advance of the required deadlines and the anticipated authorizations to start construction. The project owner must understand that submitting items required in compliance verifications prior to these authorizations is at the owner's own risk. Any

approval by CEC staff prior to project certification is subject to change based upon the Commission Decision, or amendment thereto, and early staff compliance approvals do not imply that the CEC will certify the project for actual construction and operation.

COM-5 Compliance Matrix. The project owner shall submit a compliance matrix to the CPM with each MCR and ACR. The compliance matrix shall identify:

1. the technical area (e.g., biological resources, facility design, etc.);
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Delegate Chief Building Official (DCBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., "not started," "in progress" or "completed" (include the date)); and
8. if the condition was amended, the updated language and the date the amendment was proposed or approved.

The CPM can provide a template for the compliance matrix upon request.

COM-6 Monthly Compliance Report. The first MCR is due one month following the docketing of the project's Decision unless otherwise agreed to by the CPM. The first MCR shall include the docket number and an initial list of dates for each of the events identified on the Key Events List. (The Key Events List form is found at the end of this **Compliance Conditions and Compliance Monitoring Plan** section.) During pre-construction, construction, or closure, the project owner or authorized agent shall submit an electronic searchable version of the MCR to the CPM within 10 business days after the end of each reporting month.

MCRs shall be submitted each month until construction is complete and the final certificate of occupancy is issued by the DCBO. MCRs shall be clearly identified for the month being reported. The MCR shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the MCR. Each of these items shall be identified in the transmittal letter, as well as the conditions they satisfy, and submitted as attachments to the MCR;
3. an initial, and thereafter updated, compliance matrix showing the status of all COCs;

4. a list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. a list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to COCs;
7. a listing of any filings submitted to, and permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months; the project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with COCs;
9. a listing of the month's additions to the on-site compliance file; and
10. a listing of incidents, complaints, notices of violation, official warnings, and citations received during the month; a list of any incidents that occurred during the month, a description of the actions taken to date to resolve the issues; and the status of any unresolved actions noted in the previous MCRs.

COM-7 Periodic and Annual Compliance Reports. After construction is complete, the project must submit searchable electronic ACRs to the CPM, as well as other periodic compliance reports (PCRs) required by the various technical disciplines. ACRs shall be completed for each year of commercial operation and are due each year on a date agreed to by the CPM. Other PCRs (e.g. quarterly reports or decommissioning reports to monitor closure compliance), may be specified by the CPM. The searchable electronic copies may be filed on an electronic storage medium or by e-mail, subject to CPM approval. Each ACR must include the docket number, identify the reporting period, and contain the following:

1. an updated compliance matrix which shows the status of all COCs (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the ACR; each of these items shall be identified in the transmittal letter with the condition(s) it satisfies, and submitted as an attachment to the ACR;
4. a cumulative list of all post-certification changes approved by the Energy Commission or the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings submitted to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;

8. a listing of the year's additions to the on-site compliance file;
9. an evaluation of the Site Contingency Plan, including amendments and plan updates; and
10. a listing of complaints, incidents, notices of violation, official warnings, and citations received during the year, a description of how the issues were resolved, and the status of any unresolved complaints.

COM-8 Confidential Information. Any information that the project owner designates as confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality, pursuant to Title 20, California Code of Regulations, section 2505(a). Any information deemed confidential pursuant to the regulations will remain undisclosed, as provided in Title 20, California Code of Regulations, section 2501 *et seq*.

COM-9 Annual Energy Facility Compliance Fee. Pursuant to the provisions of section 25806(b) of the Public Resources Code, the project owner is required to pay an annually adjusted compliance fee. Current compliance fee information is available on the CEC's website at http://www.energy.ca.gov/siting/filing_fees.html. The project owner may also contact the CPM for the current fee information. The initial payment is due on the date the CEC dockets its final Decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification.

COM-10 Amendments, Staff-Approved Project Modifications, and Ownership/Operational Control Changes. The project owner shall petition the CEC, pursuant to Title 20, California Code of Regulations, section 1882, to modify the design, operation, or performance requirements of the project or linear facilities. The CPM will determine whether staff approval will be sufficient, or whether CEC approval will be necessary. It is the project owner's responsibility to contact the CPM to determine if a proposed project change triggers the requirements of section 1882. Section 1882 details the required contents for a petition to amend a CEC Decision.

For changes in ownership or operational control the existing owner/operator and incoming owner/operator shall jointly in writing notify the CPM, 30 days in advance of the pending change in ownership or operational control, the fact of the change and all relevant contact information. Upon the transition, the new owner/operator will be obligated to comply with all requirements of the certification and will be subject to enforcement actions.

A project owner is required to submit a $5,000 fee for every petition to amend a previously certified facility, pursuant to Public Resources Code section 25806 (e). If the actual amendment processing costs exceed $5,000.00, the total PTA reimbursement fees owed by a project owner will not exceed the OPT cap of $1,050,850, adjusted annually. Current amendment fee information is available on the CEC's website at http://www.energy.ca.gov/siting/filing_fees.html.

COM-11 Reporting of Complaints, Notices, and Citations. Prior to the start of construction or closure, the project owner shall send a letter to property owners within one mile of the project, notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it must include automatic answering with date and time stamp recording.

The project owner shall respond to all recorded complaints within 24 hours or the next business day. The project owner shall post the telephone number onsite and make it easily visible to passersby during construction, operation, and closure. The project owner shall provide the contact information to the CPM and promptly report any disruption to the contact system or telephone number change to the CPM, who will provide it to any persons contacting him or her with a complaint.

Within five business days of receipt, the project owner shall report, and provide copies to the CPM, all complaints, including, but not limited to, noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the Noise and Vibration conditions of certification. All other complaints shall be recorded on the complaint form at the end of this compliance plan. Additionally, the project owner must include in the next MCR, ACR or PCR, copies of all complaints, notices, warnings, citations and fines, a description of how the issues were resolved, and the status of any unresolved or ongoing matters.

COM-12 Emergency Response Site Contingency Plan. No less than 60 days prior to the start of construction (or other CPM-approved) date, the project owner shall submit, for CPM review and approval, an Emergency Response Site Contingency Plan (Contingency Plan). Subsequently, no less than 60 days prior to the start of commercial operation, the project owner shall update (as necessary) and resubmit the Contingency Plan for CPM review and approval. The Contingency Plan shall evidence a facility's coordinated emergency response and recovery preparedness for a series of reasonably foreseeable emergency events. The CPM may require Contingency Plan updating over the life of the facility. Contingency Plan elements include, but are not limited to:

1. a site-specific list and direct contact information for persons, agencies, and responders to be notified for an unanticipated event;
2. a detailed and labeled facility map, including all fences and gates, the windsock location (if applicable), the on and off-site assembly areas, and the main roads and highways near the site;
3. a detailed and labeled map of population centers, sensitive receptors, and the nearest emergency response facilities;
4. a description of the on-site, first response and backup emergency alert and communication systems, site-specific emergency response protocols, and procedures for maintaining the facility's contingency response capabilities, including a detailed

map of interior and exterior evacuation routes, and the planned location(s) of all permanent safety equipment;

5. an organizational chart including the name, contact information, and first aid/emergency response certification(s) and renewal date(s) for all personnel regularly on-site;
6. a brief description of reasonably foreseeable, site-specific incidents and accident sequences (on- and off-site), including response procedures and protocols and site security measures to maintain twenty-four-hour site security;
7. procedures for maintaining contingency response capabilities; and
8. the procedures and implementation sequence for the safe and secure shutdown of all non-critical equipment and removal of hazardous materials and waste (see also specific conditions of certification for the technical areas of **Public Health, Solid Waste Management, Hazards, Hazardous Materials, and Wildfire, and Worker Safety and Fire Protection**).

COM-13 Incident-Reporting Requirements. The project owner shall notify the CPM within one hour after it is safe and feasible, of any incident at the facility that results in any of the following:

1. An event of any kind that causes a "Forced Outage" as defined in the CAISO tariff;
2. The activation of onsite emergency fire suppression equipment to combat a fire;
3. Any chemical, gas or hazardous materials release that could result in potential health impacts to the surrounding population; or create an offsite odor issue; and
4. Notification to, or response by, any off-site emergency response federal, state or local agency regarding a fire, hazardous materials release, onsite injury, or any physical or cyber security incident.

Notification shall describe the circumstances, status, and expected duration of the incident. If warranted, as soon as it is safe and feasible, the project owner shall implement the safe shutdown of any non-critical equipment and removal of any hazardous materials and waste that pose a threat to public health and safety and to environmental quality (also, see specific conditions of certification for the technical areas of **Hazards, Hazardous Materials, and Wildfire and Solid Waste Management**).

Within six business days of the incident, the project owner shall submit to the CPM a detailed incident report that includes, as applicable, the following information:

1. A brief description of the incident, including its date, time, and location;
2. A description of the cause of the incident, or likely causes if it is still under investigation;
3. The location of any off-site impacts;

4. Description of any resultant impacts;
5. A description of emergency response actions associated with the incident;
6. Identification of responding agencies;
7. Identification of emergency notifications made to federal, state, and local agencies;
8. Identification of any hazardous materials released and an estimate of the quantity released;
9. A description of any injuries, fatalities, or property damage that occurred as a result of the incident;
10. Fines or violations assessed or being processed by other agencies;
11. Name, phone number, and e-mail address of the appropriate facility contact person having knowledge of the event; and
12. Corrective actions to prevent a recurrence of the incident.

The project owner shall maintain all incident report records for the life of the project, including closure. After the submittal of the initial report for any incident, the project owner shall submit to the CPM copies of incident reports within 48 hours of a request.

If the project owner requests that an incident notification or report be designated as a confidential record and not publicly disclosed, the project owner shall submit copies of notices or reports with an application for confidential designation in accordance with CEC regulations.

COM-14 Non-Operation and Repair/Restoration Plans.

a. If the facility ceases operation temporarily (excluding planned and unplanned maintenance for longer than one week (or other CPM approved date), but less than three months (or other CPM-approved date), the project owner shall notify the CPM. Notice of planned non-operation shall be given at least two weeks prior to the scheduled date. Notice of unplanned non-operation shall be provided no later than one week after non-operation begins.

   For any non-operation, a Repair/Restoration Plan for conducting the activities necessary to restore the facility to availability and reliable and/or improved performance shall be submitted to the CPM within one week after notice of non-operation is given. If non-operation is due to an unplanned incident, temporary repairs and/or corrective actions may be undertaken before the Repair/Restoration Plan is submitted. The Repair/Restoration Plan shall include:

   1. Identification of operational and non-operational components of the plant;
   2. A detailed description of the repair and inspection or restoration activities;
   3. A proposed schedule for completing the repair and inspection or restoration activities;

4. An assessment of whether or not the proposed activities would require changing, adding, and/or deleting any COCs, and/or would cause noncompliance with any applicable LORS; and
5. Planned activities during non-operation, including any measures to ensure continued compliance with all COCs and LORS.

b. Written monthly updates (or other CPM-approved intervals) to the CPM for non-operational periods, until operation resumes, shall include:
   1. Progress relative to the schedule;
   2. Developments that delayed or advanced progress or that may delay or advance future progress;
   3. Any public, agency, or media comments or complaints; and
   4. Projected date for the resumption of operation.

c. During non-operation, all applicable COCs and reporting requirements remain in effect. If, after one year from the date of the project owner's last report of productive repair/restoration plan work, the facility does not resume operation or does not provide a plan to resume operation, the Executive Director may assign suspended status to the facility and recommend commencement of permanent closure activities. Within 90 days of the Executive Director's determination, the project owner shall do one of the following:
   1. If the facility has a closure plan, the project owner shall update it and submit it for CEC review and approval; or
   2. If the facility does not have a closure plan, the project owner shall develop one consistent with the requirements in this Compliance Plan and submit it for CEC review and approval.

COM-15: Facility Closure Planning. To ensure that a facility's eventual permanent closure and maintenance do not pose a threat to public health and safety and/or to environmental quality, the project owner shall coordinate with the CEC to plan and prepare for eventual permanent closure.

Final Closure Plan and Cost Estimate

a. No less than one year (or other CPM-approved date) prior to initiating a permanent facility closure, or upon an order compelling permanent closure, the project owner shall submit for CEC review and approval a Final Closure Plan and Cost Estimate, which includes any site maintenance and monitoring.

   Prior to submittal of the facility's Final Closure Plan to the CEC, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan's approval, the CPM may hold one or more workshops and/or the CEC may hold public hearings as part of its approval procedure.

b. Final Closure Plan and Cost Estimate contents include, but are not limited to:

1. a statement of specific Final Closure Plan objectives;
2. a statement of qualifications and resumes of the technical experts proposed to conduct the closure activities, with detailed descriptions of previous power plant closure experience;
3. identification of any facility-related installations or maintenance agreements not part of the CEC certification, designation of who is responsible for these, and an explanation of what will be done with them after closure;
4. a comprehensive scope of work and itemized budget for permanent plant closure and site maintenance activities, with a description and explanation of methods to be used, broken down by phases, including, but not limited to:
    a. dismantling and demolition;
    b. recycling and site clean-up;
    c. impact mitigation and monitoring;
    d. site remediation and/or restoration;
    e. exterior maintenance, including paint, landscaping and fencing;
    f. site security and lighting; and
    g. any contingencies.
5. a final cost estimate for all closure activities, by phases, including site
    a. monitoring and maintenance costs, and long-term equipment
    b. replacement;
6. a schedule projecting all phases of closure activities for the power plant site and all appurtenances constructed as part of the CEC-certified project;
7. an electronic submittal package of all relevant plans, drawings, risk assessments, and maintenance schedules and/or reports, including an above and below-ground infrastructure inventory map and registered engineer's or DCBO's assessment of demolishing the facility;
8. additionally, for any facility that permanently ceased operation prior to submitting a Final Closure Plan and Cost Estimate and for which only minimal or no maintenance has been done since, a comprehensive condition report focused on identifying potential hazards;
9. all information additionally required by the facility's COCs applicable to plant closure;
10. an equipment disposition plan, including:
    a. recycling and disposal methods for equipment and materials; and

b. identification and justification for any equipment and materials that will remain on-site after closure.

11. a site disposition plan, including but not limited to proposed rehabilitation, restoration, and/or remediation procedures, as required by the COCs and applicable LORS, and site maintenance activities;
12. identification and assessment of all potential direct, indirect, and cumulative impacts and proposal of mitigation measures to reduce significant adverse impacts to a less-than-significant level. Potential impacts to be considered shall include, but not be limited to:
    a. traffic;
    b. noise and vibration;
    c. soil erosion;
    d. air quality degradation;
    e. solid waste;
    f. hazardous materials;
    g. waste water discharges; and
    h. contaminated soil;
13. identification of all current conditions of certification, LORS, federal, state, regional, and local planning efforts applicable to the facility, and
14. proposed strategies for achieving and maintaining compliance during closure;
15. updated mailing list and Listserv of all responsible agencies, potentially interested parties, and property owners within one mile of the facility;
16. identification of alternatives to plant closure and assessment of the feasibility and environmental impacts of these; and
17. description of and schedule for security measures and safe shutdown of all non-critical equipment and removal of hazardous materials and waste (see COCs **Public Health, Solid Waste Management, Hazards, Hazardous Materials, and Wildfire, and Worker Safety and Fire Protection**).

If the CEC-approved Final Closure Plan and Cost Estimate procedures are not initiated within one year of the plan approval date, it shall be updated and re-submitted to the CEC for supplementary review and approval. If a project owner initiates but then suspends closure activities, and the suspension continues for longer than one year, the CEC may initiate corrective actions against the project owner to complete facility closure. The project owner remains liable for all costs of contingency planning and closure.

c. Upon approving the project owner's final closure plan, the CEC may direct that the facility's certification be terminated at the time staff finds the closure process contained in the plan has been completed.

KEY EVENTS LIST

PROJECT: Fountain Wind Project

DOCKET #: 23-OPT-01

COMPLIANCE PROJECT MANAGER: Ashley Gutierrez

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
On-line Date	
POWER PLANT SITE ACTITIES	
Start Site Assessment/Pre-construction	
Start Site Mobilization/Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Rotor and Nacelle Start-Up ~~Combustion of Turbine~~	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start Transmission Line Construction	
Complete Transmission Line Construction	
Synchronization with Grid and Interconnection	
GEOTHERMAL FLUID PIPING ACTIVITIES	
Start Geothermal Pipeline Construction and Connections	
Complete Geothermal Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	
Start Recycled Water Supply Line Construction	
Complete Recycled Water Supply Line Construction	

COMPLAINT LOG NUMBER:_____ DOCKET NUMBER:_____

PROJECT NAME:_____

COMPLAINANT INFORMATION

NAME:_____ PHONE NUMBER:_____

ADDRESS:_____

COMPLAINT

DATE COMPLAINT RECEIVED:_____ TIME COMPLAINT RECEIVED:_____

COMPLAINT RECEIVED BY: _____ ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE:_____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION):_____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL:_____

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS:_____

DESCRIPTION OF CORRECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION:_____

DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION? ☐ YES ☐ NO

IF NOT, EXPLAIN:_____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED:_____

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

OTHER RELEVANT INFORMATION:_____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE:_____ DATE: _____

Section 10

Mandatory Opt In Requirements

10 Mandatory Opt-In Requirements

10.1 "Facility" Definition Met

Summary of Requirements

The California Energy Commission (or CEC) has jurisdiction to certify certain non-fossil-fueled power plants, energy storage facilities, the electric transmission lines from these facilities to the first point of interconnection, and related manufacturing facilities.[1] A developer with a qualifying project may optionally file with the CEC to obtain a certification to construct and operate the project. The CEC is the "lead agency" under the California Environmental Quality Act and is required to prepare an environmental impact report, or Initial Study, for any facility that elects to opt-in to the CEC's jurisdiction. With exceptions, the issuance of a certificate by the CEC for an eligible facility is in lieu of any permit, certificate, or similar document required by any state, local, or regional agency, or federal agency to the extent permitted by federal law, and supersedes any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law.

A qualified opt-in project must meet one or more of the definitions of a "facility"[2]:

1. A solar photovoltaic or terrestrial wind electrical generating powerplant with a generating capacity of 50 megawatts or more and any facilities appurtenant thereto.
2. An energy storage system[3] that can store 200 megawatt hours or more of electrical energy.
3. A stationary electrical generating powerplant using any source of thermal energy, with a generating capacity of 50 megawatts or more, excluding any powerplant that burns, uses, or relies on fossil or nuclear fuels.
4. A discretionary project[4] for which the applicant has certified that a capital investment of at least two hundred fifty million dollars will be made over a period of five years.[5] The applicant must additionally provide what the facility would manufacture, produce, or assemble, and how the facility's products or services would be used in the manufacture, production, or assembly of the following:
   a. Energy storage systems or component manufacturing,
   b. Wind systems or component manufacturing,
   c. Solar photovoltaic energy systems or component manufacturing, or

1 Pub. Resources Code, § 25545.1
2 Pub. Resources Code, § 25545(b)
3 Pub. Util. Code, § 2835
4 Pub. Resources Code, § 21080
5 Pub. Resources Code, § 25545(b)(4)

d. Specialized products, components, or systems that are integral to renewable energy or energy storage technologies.[6]

5. An electric transmission line carrying electric power from a facility described in paragraph (1), (2), or (3) that is located in the state to a point of junction with any interconnected electrical transmission system.

Proposed Findings of Fact

1. Based on the information provided in the application, and additional evidence and information as described below and contained in the record of this proceeding, the project is a terrestrial wind electrical generating facility with a generating capacity of 205 megawatts (MW), thus exceeding the minimum 50 MW threshold required to meet the definition of a facility (FWPA, TN 254794).

Staff concludes the project meets one or more of the definitions of a "facility," as required under Public Resources Code § 25545(b) and recommends the CEC may adopt a proposed finding that the facility meets the requirements of Public Resources Code § 25545(b).

10.2 Requirements for Covered Project Under the Labor Code

Summary of Requirements

Public Resources Code sections 25545.3.3 and 25545.3.5 require the applicant to certify that either the entirety of the construction of the project is a public work for purposes of Chapter 1 (commencing with section 1720) of Part 7 of Division 2 of the Labor Code, or the construction of the project is not in its entirety a public work for which prevailing wages must be paid, but all construction workers employed on the project will be paid at least the general prevailing rate of per diem wages. In addition, the applicant must certify that a skilled and trained workforce will be used to perform all construction work.

The applicant submitted a letter dated November 16, 2022, (TN 248291-2) attesting that the project would meet the requirements of Public Resources Code sections 25545.3.3 and 25545.3.5. Specifically, the letter states in part that the applicant will do the following:

1. The prevailing wage requirement of AB 205 will be included in all contracts for the performance of all construction work.
2. All contractors and subcontractors will be required to pay to all construction workers employed in the construction of the project at least the general prevailing rate of per diem wages or the applicable apprentice prevailing rate, as applicable.
3. All contractors and subcontractors performing construction work will maintain and verify payroll records pursuant to Section 1776 of the Labor Code, make those records available for inspection and copying as provided therein, and furnish those

6 Cal. Code Regs., tit. 20, § 1877(b)

payroll records to the Labor Commissioner pursuant to Section 1771.4 of the Labor Code.

4. All contracts for the performance of work will require that every contractor and subcontractor at every tier will individually use a skilled and trained workforce to construct the project.
5. Every contractor and subcontractor will be required to use a skilled and trained workforce to construct the project.
6. Contractors and subcontractors that fail to use a skilled and trained workforce will be subject to the penalties provided in Section 2603 of the Public Contract Code.

Proposed Finding of Fact

Based on the information provided in the application, and additional evidence and information as described above and contained in the record of this proceeding, staff concludes the following facts are supported by substantial evidence in the record and recommends CEC adopt findings as follows:

1. The construction of the project is not a covered project subject to public works provisions of the Labor Code.
2. The applicant has committed to paying prevailing wages and using a skilled and trained workforce.
3. The November 16, 2022, letter (TN 248291-2) meets the requirements of Public Resources Code sections 25545.3.3 and 25545.3.5.

Conclusions. Based on the content of the certification contained in the application the requirements of Public Resources Code Sections 25545.3.3 and 25545.3.5 have been met.

10.3 Identification of Whether Site is Located at a Prohibited Area

Summary of Requirements

The opt-in applicant must identify whether the project is located on a prohibited site as identified in Public Resources Code section 25527 or on a site designated by the California Coastal Commission under Public Resources Code section 30413(b) or on a site designated by the San Francisco Bay Conservation and Development Commission under Government Code section 66645(b). For projects on such a site, the opt-in application shall include documentation of the approval of the public agency having ownership or control of the land.[7]

7 Cal. Code Regs., tit. 20, § 1877(e)

Proposed Findings of Fact

Based on the information provided in the application, and additional evidence and information as described below and contained in the record of this proceeding, staff recommends the CEC make the following findings and conclusions because the record contains substantial evidence for their support:

1. The applicant has identified that the proposed project is located on 37 parcels of privately-owned land in an unincorporated area of Shasta County (FWPA, TN 254794) and nothing in the record contradicts this factual assertion. The project area is designated by the Shasta County General Plan as Timber (T) and has a zoning designation of Timber Production (TP). The project site is not located on a prohibited site as identified in Public Resources Code section 25527, which includes a State, regional, county or city park; wilderness, scenic or natural reserves; or areas for wildlife protection, recreation, historic preservation, or natural preservation (FWPA, TN 248321). Similarly, consistent with Public Resources Code section 25527, there are no estuaries in an essentially natural and undeveloped state on the project site. The project is not located on a site designated by the San Francisco Bay Conservation and Development Commission as identified in Public Resources Code section 66645(b). The project site is not located in a coastal zone (FWPA, TN 248321).

Conclusions. Based on the location of the project, staff has concluded that the site is not within a prohibited site as identified in Public Resources Code section 25527 or on a site designated by the California Coastal Commission under Public Resources Code section 30413(b) or on a site designated by the San Francisco Bay Conservation and Development Commission under Government Code section 66645(b). Staff recommends the CEC may adopt this proposed finding and conclusion as it is supported by substantial evidence in the record.

10.4 Net Positive Economic Benefit to the Local Government

Summary of Requirements

Public Resource Code section 25545.9 states:

The commission shall not certify a site and related facility under this chapter unless the commission finds that the construction or operation of the facility will have an overall net positive economic benefit to the local government that would have had permitting authority over the site and related facility.

The local government that would have had permitting authority is Shasta County. Thus, the record must contain substantial evidence to support a finding that the project will result in a net positive economic impact to Shasta County for the CEC to approve the project.

In support of a net economic benefit to the County, the applicant submitted the following two studies and a set of county data:

1. *Local Economic Effects of Wind Energy Projects*, Stantec Consultants, September 14, 2020. (TN 248292-3)
2. *Fountain Wind Project Economic and Public Revenue Impact Study*, Economic and Planning Systems, Inc, March 25, 2021. (TN 248292-2)
3. *2022 Shasta County Economic Forecast,* (TN 250499)

Note that the second study which is project specific, addressed the original 216 MW project under review in 2021, but assumed only 45 turbines were installed, not the higher potential size of a 72-turbine project. The second study utilized the U.S. Department of Energy's Jobs and Economic Development Impact (JEDI) input-output (I/O) mode with project specific figures to generate the estimated numbers. The reports identified the following categories and estimated economic benefits for Shasta County:

1. $4 million in one-time County sales and use tax revenues from the construction phase.
2. $60 million in property tax revenues over the life of the project, an average of about $1.7M annually
3. Under current tax allocation factors, of this $60 million total, about $7.5 million would remain with the County, $4 million to Cities, $3.6 million to Special Districts, $8 million to Redevelopment Property Tax, $9 million to the Educational Revenue Augmentation Fund, and $28 million to Schools, over the 35-year life of the project.
4. While not a direct benefit to Shasta County, project construction is estimated to generate 450 job-years, about $27 million in employee compensation, and about $60 million in total economic output/ sales in Shasta County.
5. Also, not a direct benefit to Shasta County, project operation will provide 8 ongoing jobs, about $2.5 million in employee compensation, and just over $6 million in economic output/ sales activity each year during its 35-year lifetime.
6. Cumulatively indirect Shasta County benefits over the 35-year period include, project Operations will provide 1,456 job-years, $90.4 million in employee compensation, and $210.3 million in economic output/ sales activity in the County.

In *Local Economic Effects of Wind Energy Projects*, the report considers the impact of wind energy projects on property values. The report finds that studies have generally confirmed that wind energy facilities have no statistically significant effect on property values. In a 2010 study Lawrence Berkeley National Laboratory (LBNL) looked at the effect of proximity and view on sales prices of 7,500 single-family homes situated within 10 miles of 24 existing wind facilities in Washington, Oregon, Texas, Oklahoma, Iowa, Illinois, Wisconsin, Pennsylvania, and New York. Neither the view of the wind facilities nor the distance of the home to those facility was found to have a statistically

significant effect on home sales prices. (Hoen, B., Wiser, R., Cappers, P., Thayer, M., and Sethi, G. 2010. Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices (Hoen, 2010).

A follow-up to this study in 2013 looked at data from over 50,000 home sales among 27 counties in nine states. The homes were within 10 miles of wind facilities, and approximately 1,200 homes sold were within one mile of a turbine. Again, the study found "no statistical evidence that home values near turbines were affected in the post-construction or post-announcement/pre-construction periods," suggesting that "the property-value effect of wind turbines is likely to be small, on average, if it is present at all." (Hoen et al., 2013).

Neither report submitted identifies any costs to Shasta County from the project such as any loss in tourism, road damage, costs associated with wildfire caused or exacerbated by the project, or other potential costs to Shasta County. Thus, based on the applicant's filings, there would be a gross positive economic benefit to Shasta County.

Other evidence of economic cost to the local government that would have had permitting authority over the project, i.e. Shasta County, is in the record. Shasta County submitted a comment prepared by Beacon Economics dated July 31, 2024 (TN259437) titled "Fountain Wind Project: Completeness Evaluation of the Net Economic Impact Study". The document references some published documents as sources for evaluating the economic impacts of terrestrial wind projects.

Staff notes the legal requirement in AB 205 is not to evaluate the economic impact of the project, but to assess the net economic impact on the local government that would otherwise have permitting authority over the project had the application not been filed with CEC. Shasta County would be the entity with whom applicant could have filed this application, therefore the relevant inquiry is the economic costs to Shasta County.[8] Impacts to non-governmental elements of the local community are not relevant to the statutory requirement of Public Resources Code Section 25545.9, evaluated here.

Relevant to this analysis, a jobs growth or impediment estimate, if well supported, would potentially impact the local government by providing additional sales tax for increased population, and increased resources burden for schools, recreation district costs, emergency services and other municipal services. The Beacon document asserts these types of costs would exist as a result of the project, but provides no quantification of these costs that would provide substantial evidence to reach a calculation of net economic benefit.

The record contains a legislative determination by Shasta County regarding the economic impact of wind facilities like the proposed project. Shasta County Ordinance 17.88.335 which prohibits large wind facilities in unincorporated areas of Shasta County

8 Although a very similar project was denied by Shasta County in 2021, CEQA does not prohibit a developer from re-filing a denied project with the permitting entity that previously denied the project.

also states that due to the impacts from a large wind facility, the construction or operation of large wind energy systems will not have an overall net positive economic benefit to the County of Shasta. Ordinance 17.88.335 directs the Director of Resource Management to "evaluate the economic impacts of the proposal and prepare and present a comment letter regarding the economic impacts of the proposal to the Board of Supervisors for their consideration. When directed by the Board of Supervisors, submit a comment letter regarding the economic impacts of the proposal to the California Energy Commission and on such other impacts as may be directed by the Board of Supervisors."

Shasta County filed additional comments to the docket on November 15, 2024, and December 13, 2024, which included a discussion of the adverse economic impacts of wildfire damage and associated fire insurance increases (COS 2024l and COS 2024j, respectively). The County asserts that wildfire costs (e.g., direct damages and property-related costs, higher insurance premiums, and loss of insurance coverage) must be accounted for in any overall net positive economic benefit analysis under Public Resources Code section 25545.9. The County identifies the following costs as offsets that should be evaluated and quantified as part of the calculation of net economic benefit (COS 2024l):

1. Wildfire Costs and Damages
    a. The property costs associated with direct fire damage in Shasta County is extensive with approximately $87,392,000 due to the Zogg, Dixie, Salt and other wildfires.
    b. Damages caused by wildfires in the surrounding counties are extensive with approximately $194,800,000 in direct damages in Lassen, Tehama, Butte, Plumas, Trinity and Siskiyou counties.
    c. PG&E costs and penalties for its culpability in various Shasta County and regional wildfires have totaled approximately $500,000,000, although this amount does not reflect economic damages.
    d. Economic costs also include replacement of lost or damaged structures, time delay, the discouragement of future investment, damage to wildland ecosystems, environmental recovery, and a decrease in tourism.
2. Wildfire impacts on the cost of fire insurance
    a. Shasta County is one of the highest risk areas of the state and nation for wildfires.
    b. Marginal increases in wildfire risk have not been priced into the Fountain Wind Project, including fire insurance premiums.
    c. Small increases in premiums of 1 percent or 5 percent can have significant impact on economic activity and across all economic sectors.

d. Increased fire insurance premiums slow real estate markets, which compound reduced growth and costs over time.

e. The overall result is that money effectively "leaves" the local economy.

In its December 13, 2024, filing, Shasta County argues that an overall “net” positive economic benefit cannot be demonstrated, and that the applicant has not yet submitted a net analysis, thus, this item is incomplete.

Staff finds that unlike the benefit metrics such as property tax, costs to the County from the project are more difficult to assess and require multiple assumptions. For example, trying to attribute wildfire costs from the project that will be incurred to the County or the impacts to tourism due to large imposing wind turbines.

As detailed in the next section, staff attempted to assess potential costs on the County from the project so that the CEC can reach a conclusion as to whether the project is a net economic benefit for the County. Based on multiple scenarios, staff concludes the project will have an overall net positive economic benefit to the County and that the project meets the requirements of Public Resources Code section 25545.9.

Staff assessment of net economic benefits

To determine if Fountain Wind provides net positive economic benefits to Shasta County, staff estimated gross economic costs to subtract from the gross economic benefits to get net economic benefits. Staff considered gross economic benefits and costs for the construction phase (2 years) and operation (35 years) of the project, For the net economic analysis, staff followed these steps:

- Using the National Renewable Energy Laboratory’s (NREL) Jobs and economic development (JEDI) model[1] and the IMPLAN economic modeling software[2], staff re-created the gross economic impacts from fountain wind construction and operations, to assess their reasonableness.
    - Staff did not have Shasta County-specific data so used generic U.S.-wide data from the NREL JEDI model
    - Staff found that their generic data (not Shasta County-specific) matched well with the applicant’s estimates
    - From this first part, staff concluded the applicant’s estimates of gross economic benefits are reasonable, and will use their estimates for the rest of the analysis
- Next, staff considered potential gross negative economic impacts to Shasta County:
    - Fountain Wind is expected to displace a small portion of private timberlands areas in Shasta County. As timberlands production provides an economic benefit to Shasta County, staff estimated the negative economic impact from displacing this timberlands resource. If less timberland areas are available, then less timber product will be produced; this is a potential negative economic impact.

- Fountain Wind also has the potential to increase the risk of igniting wildfires and increasing the burn area and damage to property and buildings. There are two parts to estimating the negative economic impacts from wildfires:
  - Increased fire risk mitigation costs represent a negative economic impact to Shasta County. For example, given a wildfire occurs (either because of Fountain Wind activities, or anther cause), The fire can be more difficult to suppress and cause more economic harm than if Fountain Wind is not built as the tall wind turbines impact arial firefighting.
  - Second, wind turbines can malfunction and ignite a fire. For this part, the damaged property and buildings could be a negative impact to Shasta County (assuming the cost of fire damage is born by the county)

For the first part (re-creating gross economic impacts), staff studied the economic analysis performed by the applicant, then using IMPLAN and NREL's JEDI model, staff attempted to verify the accuracy of the analysis, but project-specific information was not available; however, staff used information specific to Shasta County. The applicant used some project-specific inputs for their modeling that are not available, so their estimates differed from staff's.

Staff compared the project's economic analysis that uses project-specific data to CEC staff's estimates that use generic public data. The next two tables show the applicant's economic analysis using Shasta County and project-specific inputs, compared with staff's estimates (Shasta-specific but not project-specific). The estimates of economic benefits show some differences.

First, for the construction phase, the applicant's estimates of gross direct benefits are roughly 50 percent higher than staff's estimates, and the indirect and induced gross benefits are about 5 percent and 25 percent less than staff's. Overall, the applicant's estimates are larger than staff's for job creation (40 percent higher), but smaller for economic output (3 percent smaller).

For operations, the applicant's gross direct benefits are roughly 50 percent larger than staff's estimate, but indirect and induced benefits are roughly 50 percent smaller. Overall, for operations, the results are mixed. Staff estimates about 11 percent more jobs and 30 percent more labor income, but 30 percent less economic output during operations (for direct, indirect, and induced gross benefits combined). See **Table 10-1** and **Table 10-2**.

TABLE 10-1 CONSTRUCTION PHASE, CEC VS FW GROSS ECONOMIC BENEFITS (TOTAL)

	Number of Jobs		Labor Income (Million $)		Value Added (Million $)		Economic Output (Million $)	
	FW	CEC	FW	CEC	FW	CEC	FW	CEC
Direct	142	37	11.8	5.5	10.7	5.5	12.2	5.7
Indirect	199	133	9.8	10.3	16.3	17.3	29.7	34.5
Induced	109	106	5.9	7.6	10.8	13.7	17.7	21.6

TABLE 10-2 OPERATIONS PHASE, CEC VS FW GROSS ECONOMIC BENEFITS (ANNUAL)

	Number of Jobs		Labor Income (Million $)		Value Added (Million $)		Economic Output (Million $)	
	FW	CEC	FW	CEC	FW	CEC	FW	CEC
Direct	8	9	1.0	0.6	1.1	0.6	1.2	0.6
Indirect	25	21	1.1	1.5	2.2	5.6	3.5	7.4
Induced	9	17	0.5	1.3	0.8	2.3	1.4	3.6

Staff also compared the applicant's estimated fiscal benefits. Staff estimates are larger than the applicant's, (about four times as large). This is likely due to staff using generic assumptions in the NREL JEDI wind model (local content percentages) vs the applicant using more project-specific information The applicant's fiscal benefits estimates seem reasonable.

TABLE 10-3 GROSS FISCAL BENEFITS- CEC VS FW

Tax Revenue ($)	Applicant	CEC
Property Tax (Annual)	$1,719,240	$1,737,558
Annual Sales tax	$111,450	$435,660
Sales Tax (construction, one-time)	$3,900,761	$16,351,049

This completes the first step of CEC's analysis of net economic benefits. Based on this step, staff finds the applicant's estimates of gross economic benefits are reasonable and will use the estimates for the second part of the analysis.

For the second part, staff starts with the applicant's estimates of gross economic benefits then runs scenarios of gross economic costs to subtract from the gross benefits to identify a range of net economic benefits. Gross economic cost estimates include potential loss of production to private timberlands and different levels of fire risk and cost to the county. Staff reviewed relevant information in the project docket, and other public sources, to assess potential negative impacts to the county.

Timberlands Impacts

Staff used a timber analysis from the Fountain Wind docket to estimate impacted timber acres and the potential negative economic impacts. The timber analysis estimates 548 acres of timberlands will be temporarily impacted during construction and 510 acres will be permanently impacted during operations. (FWPA, TN 251438) 2002 data from

Shasta County estimates there are 1,231,000 acres of production timberlands in the county and in 2002 the county timber production value was $39,000,000.

Shasta County estimates the production value of timber from 2019, 2020, and 2021 to be: $39,721,204, $37,486,268, and $30,516,743, respectively.[9] The average value is $35,000,000. Staff will use the high end $40,000,000 (rounded up) as a production value to estimate per acre value of timber production and negative economic impact (dollar terms) from FW construction and operation.

The $40,000,000 timber production value divided by 1,231,000 acres of timberlands in Shasta County dedicated to commercial forest use production equals $32/acre of timber production value. Now looking at the expected impacted timber acres (from docketed timber analysis), we get $32/acres times 548 acres equals $17,807 per year of negative timber impact (production value) during each of the two years of construction. For the operations phase, we get $32/acre times 510 acres equals $16,572 of negative production value, annually, during operations. Staff will start with these values to determine impacts to use in IMPLAN as direct negative economic impacts to the timber industry in Shasta County.

To account for direct negative timber impacts to use in IMPLAN, staff assumes annual impacts during construction and operations are $30,000, almost double the estimates described above. Staff is using the larger value to account for uncertainty (in case the value of timber increases). The $30,000 will account for increased timberlands value, or more timberlands being impacted (taken out of production) than expected.

For the timber industry, staff used IMPLAN code 15 (forestry, forest products, and timber tract production). Staff is using the values as the applicant did not provide detailed quantitative information on impacts to the timber industry.

There could also be a negative fiscal impact to the county from reduced tax revenues from the reduced timber production. The California Department of Tax and Fee Administration (CDTFA) sets the tax rate for timberlands production in California; the current timberland yield tax is 2.9%. [10] With this information, the negative annual fiscal impacts to Shasta County from lost timberlands could be $516 ($17,807 * 2.9%) and $481 ($16,572 * 2.9%) for the construction and operations phases, respectively. If we assume $30,000 per year in lost timber production value, the County could experience a negative fiscal impact of $870 ($30,000 * 2.9%). The applicant's estimates of positive fiscal impacts from just property taxes from the project is over $1.7 million, much larger than staffs estimated negative fiscal impacts from lost timberlands production.

9 Crop and Livestock Report: 2022: https://www.shastacounty.gov/media/28411
10 See https://www.cdtfa.ca.gov/taxes-and-fees/special-taxes-and-fees-tax-rates/#timber-yield-tax. The tax rate is on the assessed production value, not the value the timber or timber products were sold for.

Wildfire Impacts:

Wildfires can destroy land and property and cause economic harm to communities. The cost of wildfire mitigation and suppression can be millions of dollars for a single fire. The Fawn fire near Redding[11] (2021) cost $25 million to suppress (8,500 acres), while the Creek Fire[12] (Sept 2020) destroyed 380,000 acres and cost $200 million to suppress. Pacific Gas and Electric Company (PG&E) paid $55 Million for two wildfires in Northern California.[13] The average cost per acre to suppress a wildfire based on the Fawn and Creek fire estimates above in California is about $1,730 per acre. Although each wildfire in California will be different, these historical wildfires give us an idea of the economic costs.

Due to the height of the turbines for the Fountain Wind project (over 600 ft), aerial firefighting efforts would be hindered to some extent. During construction and operation, the probability of igniting a fire would be increased. The Fountain Wind project has the potential to increase the probability of a fire occurring and increase the potential burn area of a given fire (as it is more difficult for aerial firefighting efforts). Staff considers two parts in estimating the potential negative economic impacts from wildfire from Fountain Wind activities:

- Increased mitigation and suppression costs to the county given a fire occurred (whether or not it was caused by FW activities) as aerial firefighting is more difficult with the height of the wind turbines
- Negative economic impact to the county from fires caused by the construction or operations of the project. These negative impacts will include property damage to any county owned building or other infrastructure the county is responsible for, and costs for potentially expanded disaster planning, preparedness, mitigation, response and recovery activities.

To directly estimate the negative economic impacts to Shasta County from wildfire suppression, mitigation, and damage to property, detailed information that is unavailable would be necessary. Such information includes:

- The cost to mitigate the increased difficulty for aerial firefighting
  - New fire fighter infrastructure, training, and technology
- The negative cost to the County, on average, of property and other damages expected as a result of FW activities
- Public funding mechanisms and levels for disaster preparation and response activities

11 https://www.redding.com/story/news/2021/10/03/fawn-fire-near-redding-100-contained-cost-25-million-suppress/5983085001/
12 https://www.fresnobee.com/news/california/fires/article248158005.html
13 https://www.pbs.org/newshour/nation/pge-to-pay-55-million-for-two-massive-california-wildfires

Absent this information staff relied on estimates from public information to develop three scenarios for negative impacts (costs) to the County from wildfires related to FW:

1. Base (lower fire risk) scenario: no fire occurs around or near the project during its construction or operations. This case does assume negative economic impacts to Shasta County from reduced timberlands production.
2. Increased mitigation and suppression cost (increased fire mitigation) scenario: This scenario assumes fire/s may occur at or around the project but were not started because of FW activities. This case assumes it will cost more to suppress and mitigate wildfires because of the FW turbine heights (over 600 feet). The increased costs to the county in this case could represent new fire fighting infrastructure, equipment, and training for fire fighters, and disaster response and recovery planning costs. This case also assumes negative impacts to the timber industry.
3. An increased fire damage case (stress case): this case assumes that, along with negative impacts to the timber industry, and increased mitigation and suppression costs, additional costs to the county from wildfires caused by FW activities, to include deployment of disaster response resources, and redevelopment costs. FW activities can increase the probability of wildfire igniting and damaging property and infrastructure the county is responsible for. In this case, staff will estimate these direct negative impacts to Shasta County.

All Three Scenarios:

For all three scenarios staff assumes negative impacts to timberlands output of $30,000 per year for construction ($60,000 total for two years) and operations. Each scenario includes additional negative economic impacts from wildfire impacts.

Low Fire Risk Scenario (base):

Although the applicant did not provide information on wildfire risk, staff found information in the Fountain Wind docket that estimates some potential costs of fire risk mitigation. The Condition of Certification **Worker Safety-8** assumes the applicant is responsible for the cost of mitigating increased fire risk.[14] **Worker Safety-8** says the applicant will pay the county a one-time payment of $1,000,000, and annual payments of $340,000 over the 35-year life of the project. Staff made this determination based on the record of conversation with the Shasta County fire chief.[15] In Condition of Certification **Worker Safety-8,** staff determined that with construction of four additional energy-related projects, funding should be provided equally by the project plus the other energy projects to build a new fire house to be located at the current Mongomery Creek Fire Station (or another location to be determined by the SCFD) for

14 Staff Assessment, Worker Safety and Fire Protection, worker safety 8: https://caenergy.sharepoint.com/:w:/r/sites/SEBE/_layouts/15/Doc.aspx?sourcedoc=%7B5D413887-69C3-4B82-853E-EFAD88DC5611%7D&file=4.4%20WSFP_FW%20supe%20approved.docx&action=default&mobileredirect=true

15 https://efiling.energy.ca.gov/GetDocument.aspx?tn=254837&DocumentContentId=90492

the amount of $5M ($1M to be provided by the Fountain Wind and each of the other projects if built) and provide full-time staffing for an annual amount of $1.7M ($340,000 per year provided by each project).

If Condition of Certification **Worker Safety-8** does not go through, then Shasta County could be responsible for these costs for wildfire mitigation. Staff used these values to model (in IMPLAN) the potential negative economic impacts (direct, indirect, and induced) from increased fire risk mitigation and suppression. The base or low fire risk case will use these values for fire mitigation and suppression costs (negative economic impacts to Shasta County). This scenario represents a lower fire risk/cost case where there are some negative impacts to the timber industry.

For construction, the impacts from loss of timberlands production and increased wildfire mitigation and suppression reduces total job years by 3 percent (about 15 job years lost). Economic output decreases by the same percentage ($1.6 million per year). See **Table 10-4**.

TABLE 10-4 LOW FIRE RISK SCENARIO: CONSTRUCTION PHASE ECONOMIC IMPACTS (ANNUAL)

	Employment (Job Yrs)				Economic Output (Million $)			
Phase	FW	CEC-Fire	CEC Timber	**Net**	FW	CEC-Fire	CEC Timber	**Net**
Direct	142	-10.7	-0.9	**130**	12.2	-0.98	-0.06	$11
Indirect	199	-0.1	-0.2	**199**	29.7	-0.03	-0.02	$30
Induced	109	-3.4	-0.2	**105**	17.7	-0.59	-0.03	$17
Total Impacts	**450**	**-14.2**	**-1.3**	**435**	**59.6**	**-1.60**	**-0.11**	**$58**

For the operations phase, annual jobs decrease 28 percent (42 to 30), and annual economic output decreases by 20 percent, or $1 million. Annual net economic benefits for the low fire risk scenario are lower, but still positive. See **Table 10-5**.

TABLE 10-5 LOW FIRE RISK SCENARIO: OPERATIONS PHASE ECONOMIC IMPACTS (ANNUAL)

	Employment (annual jobs)				Economic Output (Million $)			
Phase	FW	CEC-Fire	CEC Timber	**Net**	FW	CEC-Fire	CEC Timber	**Net**
Direct	8	-3.6	-5.0	**-1**	$1.17	-$0.3	-$0.3	$0.49
Indirect	25	0.0	-1.0	**24**	$3.49	$0.0	-$0.1	$3.35
Induced	9	-1.2	-1.0	**7**	$1.35	-$0.2	-$0.2	$0.98
Total Impacts	**42**	**-4.8**	**-7.0**	**30**	**$6**	**-$0.5**	**-$0.7**	**$5**

High Fire Cost Scenario:

This Scenario builds on the low fire risk scenario by assuming a larger cost for wildfire mitigation, suppression and recovery. Staff relied on information from the project

docket for this Scenario; in particular, staff used information from a record of conversation with the Shasta County fire chief.[7] The fire chief stated that to mitigate the increased fire risk from the project up to two new fire stations would need to be built, and the fire stations cost $5-$8 million, each, to build, and $1.7 million to operate each year.

With this information, staff assumed one fire station would be built, with a cost of $5 million (CEC 2024g). Staff assumes the operation costs would be $1.7 million. As the applicant finds that the fire risk impact would be less than significant, but not zero, staff used estimates from the lower end of the range. This scenario provides a more expensive case for fire risk mitigation. Staff used both of the above fire risk mitigation estimates to model the direct economic costs in IMPLAN (average and high fire mitigation scenario).

For the construction phase, over 100 job years were lost from fire mitigation and suppression costs. Together with the negative timber industry impacts, this scenario has 25 percent less job years than the gross estimates. Estimates show almost 13 million in negative impacts each year from increased county costs for wildfire mitigation and suppression. Together with the negative timber industry impacts, this scenario reduces economic output by almost 21 percent from the gross estimates. Economic output represents the total value of goods and services produced within Shasta County over a given time period (1 year, or 24 months, etc.). Economic output does not directly equate to benefits to the Shasta County government as economic output can impact anyone within the county- not just the local government. For this analysis, economic output will be used as a comparative measure between scenarios. The construction phase net economic benefits are positive although they are less than the gross estimates. See **Table 10-6**.

TABLE 10-6 HIGH FIRE COST SCENARIO: CONSTRUCTION PHASE ECONOMIC IMPACTS (TOTAL)

	Employment (Job Yrs)				**Economic Output (Million $)**			
Phase	FW	CEC-Fire	CEC Timber	**Net**	FW	CEC-Fire	CEC Timber	**Net**
Direct	142	-85.33	-0.91	**56**	12.2	-7.84	-0.06	$4
Indirect	199	-1.01	-0.22	**198**	29.7	-0.24	-0.02	$29
Induced	109	-27.32	-0.17	**82**	17.7	-4.72	-0.03	$13
Total Impacts	**450**	**-113.7**	**-1.3**	**335**	**59.6**	**-12.80**	**-0.11**	**$47**

For the operations phase, job-years decreased by almost 60 percent from the gross estimates and economic output decreased by about 46 percent. The net economic benefits are positive in this scenario See **Table 10-7**.

TABLE 10-7 HIGH FIRE COST SCENARIO: OPERATIONS PHASE ECONOMIC IMPACTS (ANNUAL)

	Employment (annual jobs)				Economic Output (Million $)			
Phase	FW	CEC-Fire	CEC Timber	**Net**	FW	CEC-Fire	CEC Timber	**Net**
Direct	8	-18.1	-0.5	**-11**	$1.17	-1.67	-0.03	($0.53)
Indirect	25	-0.2	-0.1	**25**	$3.49	-0.05	-0.01	$3.43
Induced	9	-5.8	-0.1	**3**	$1.35	-1.00	-0.01	$0.33
Total Impacts	**42**	**-24.2**	**-0.6**	**17**	**$6**	**-2.72**	**-0.05**	**$3**

High Fire Property Damage Scenario (stress case):

This Scenario builds on the high fire cost scenario by assuming a larger cost for wildfire mitigation and suppression, as well as total costs (negative impacts) for property and other damage to the county from fires caused by FW activities. This scenario, of the three staff considered, assumes the largest negative economic costs to the county.

This scenario assumes Shasta County will build and pay for one new fire station during construction of FW, $8 million, so $8 million during the construction phase ($4 million /year in direct negative economic impacts during construction). During the operations phase, the negative impact (cost) to the county will be $1.7 million per year to operate the fire station. These wildfire mitigation costs are in addition to the negative timberlands impacts.

Next, staff estimates costs from project-caused fires that damage property and other structures that Shasta County is responsible for. This scenario represents a stress case scenario where fire mitigation and suppression costs are larger than expected and wildfire is expected to occur from FW activities during construction and or operations. To estimate these costs, staff uses public information from the California Department and Forestry and Fire Protection to use the total damage to Shasta County from wildfires caused by the electric power system. Over the last five years, on average, total damage to the county from electric power was over $10 million dollars (mainly due to the $50 million costs in 2020).

Staff searched the literature to find estimates on the probability of wind turbine fires. Many studies estimate that 1 in 7,000 to 1 in 2,000 wind turbines catch fire. (NAWP, 2023, [16] [17][18][19][20] To account for potential increased wildfire risk in this stress case, staff used the higher end of the range (48 turbines *[1 / 2,000] = 2.4 percent, or the expected number of project fires [0.024 fires] per year). Next, we multiply this percentage by the average dollar damage to Shasta County from electric power fires

17 https://www.windsystemsmag.com/wind-turbine-fire-risk-the-time-to-act-is-now/
18 https://www.windsystemsmag.com/wind-turbine-fire-risk-the-time-to-act-is-now/
19 https://www.powerengineeringint.com/renewables/wind/the-burning-issue-of-wind-turbine-fires/
20 https://www.firetrace.com/fire-protection-blog/wind-turbine-fire-statistics

from 2019 through 2023 ($10.2 million) to get the expected cost from 10.2 million* 2.4 percent equals $244,378 per year in damages from the project. This dollar amount may include damages to personal or other property that the county is not responsible for; therefore, these values may overestimate wildfire damage costs directly to Shasta County. This value may also include damages from other electric power (solar or natural gas for example)- this may overestimate the projects negative impacts to Shasta County for fire damage. Lastly, these values are 'total damages', so they could also include indirect and induced impacts to the county. Staff assumes the $244,378 is total annual expected cost (negative economic output) to the county each year during project construction and operations.

TABLE 10-8 HIGH FIRE DAMAGE SCENARIO: CONSTRUCTION PHASE ECONOMIC IMPACTS (TOTAL)

	Employment (Job Yrs)					Economic Output (Million $)				
Phase	FW	CEC-Fire Mitigation	CEC-Timber	CEC-Fire Damage	**Net**	FW	CEC-Fire Mitigation	CEC-Timber	CEC-Fire Damage	**Net**
Direct	142	-170.66	-0.91		**-30**	12.2	-15.69	-0.06	-0.49	-$4
Indirect	199	-2.01	-0.22		**197**	29.7	-0.48	-0.02		$29
Induced	109	-54.64	-0.17		**54**	17.7	-9.44	-0.03		$8
Total Impacts	**450**	**-227.3**	**-1.3**		**221**	**59.6**	**-25.61**	**-0.11**	**-0.49**	**$33**

TABLE 10-9 HIGH FIRE DAMAGE SCENARIO: OPERATIONS PHASE ECONOMIC IMPACTS (ANNUAL)

	Employment (Job Yrs)					Economic Output (Million $)				
Phase	FW	CEC-Fire Mitigation	CEC-Timber	CEC-Fire Damage	**Net**	FW	CEC-Fire Mitigation	CEC-Timber	CEC-Fire Damage	**Net**
Direct	8	-18.1	-0.5		-10.6	1.17	-1.67	-0.03	-0.24	-0.8
Indirect	25	-0.2	-0.1		24.7	3.49	-0.05	-0.01		3.4
Induced	9	-5.8	-0.1		3.1	1.35	-1.00	-0.01		0.3
Total Impacts	**42**	**-24.2**	**-0.6**		**17.2**	**6.01**	**-2.72**	**-0.05**	**-0.24**	**3.0**

Conclusions. Based on these three scenarios with conservative assumptions of potential costs to the County, the project continues to show a net positive economic impact for the County. Although under the more extreme scenarios some of the categories turn negative, overall staff finds the project meets the requirements of Public Resources Code section 25545.9.

10.5 Legally Binding Enforceable Agreement(s) for Community Benefits of the Project

Summary of Requirements

Public Resources Code section 25545.10(a) states that the CEC shall not certify a site and related facility unless the CEC finds that the applicant has entered into one or more

legally binding and enforceable agreements with, or that benefit, a coalition of one or more community-based organizations, such as workforce development and training organizations, labor unions, social justice advocates, local governmental entities, California Native American tribes, or other organizations that represent community interests, where there is mutual benefit to the parties to the agreement.

The topics and specific terms in the community benefits agreements may vary and may include workforce development, job quality, and job access provisions that include, but are not limited to, any of the following:

1. Terms of employment, such as wages and benefits, employment status, workplace health and safety, scheduling, and career advancement opportunities.
2. Worker recruitment, screening, and hiring strategies and practices, targeted hiring planning and execution, investment in workforce training and education, and worker voice and representation in decision making affecting employment and training.
3. Establishing a high road training partnership, as defined in Section 14005 of the Unemployment Insurance Code.

The topics and specific terms in the community benefits agreement may also include, but not be limited to, funding for or providing specific community improvements or amenities such as park and playground equipment, urban greening, enhanced safety crossings, paving roads and bike paths, and annual contributions to a nonprofit or community-based organization that awards grants to organizations delivering community-based services and amenities. (Pub. Resources Code § 25545.10(b).)

The topics and specific terms in agreements with California Native American tribes may include, but not be limited to, cultural preservation and revitalization programs, joint management and stewardship agreements, open-space preservation agreements, repatriation and reparations agreements, and other compensatory mitigation programs. (Pub. Resources Code § 25545.10(c).)

The applicant submitted an executed agreement with the Northeastern California Building and Construction Trades Council, an organization that represents workers in Shasta, Tehama, Trinity, Lassen, Modoc and Siskiyou counties. (TN 253611). The Northeastern California Building and Construction Trades Council is located within Shasta County and comprised of local labor union affiliates. The agreement states that the funding will benefit the Northeastern California Building and Construction Trades Council by furthering its workforce training and development purposes while benefitting the applicant by satisfying the requirements of Public Resources Code section 25545.10 in furtherance of developing the Project in accordance with the State of California's renewable energy goals.

The applicant has agreed to provide the Northeastern California Building and Construction Trades Council $175,000 for workforce training and development purposes, including workplace health and safety, job quality and job training, worker

recruitment, screening, and hiring strategies and practices, targeted hiring planning and execution, investment in workforce training and education, and worker voice and representation in decision making affecting employment and training. Additionally, the agreement requires a portion of the funds to support conducting job fairs for the Project in both Redding and Burney and provide at least two month-long Multi-Craft Core Curriculum Trainings in both Redding and Burney on or before commencement of the Project's commercial operations.

Proposed Findings of Fact

Based on the information provided in the application, the submitted executed agreement between the applicant and the Northeastern California Building and Construction Trades Council (TN 253611) and additional evidence and information as described below and contained in the record of this proceeding, staff recommends the CEC make the following findings and conclusions because the record contains substantial evidence for their support:

1. The applicant has entered into a legally binding and enforceable agreement with or that benefit the Northeastern California Building and Construction Trades Council.
2. The Northeastern California Building and Construction Trades Council is an organization comprised of local labor union affiliates, which is a qualified organization under Public Resources Code section 25545.10(a).
3. Applicant has identified the following mutual benefit(s) to the parties of the agreement: the Northeastern California Building and Construction Trades Council will benefit by furthering its workforce training and development purposes. The applicant will benefit by satisfying the requirements of Public Resources Code section 25545.10 in furtherance of developing the Project in accordance with the State of California's renewable energy goals.
4. Applicant has identified that the agreement will include providing $175,000 to the Northeastern California Building and Construction Trades Council for workforce training and development purposes in accordance with Public Resources Code section 25545.10, including workplace health and safety, job quality and job training, worker recruitment, screening, and hiring strategies and practices, targeted hiring planning and execution, investment in workforce training and education, and worker voice and representation in decision making affecting employment and training.

Based on the foregoing proposed findings, staff concludes that the applicant has entered into one or more legally binding and enforceable agreements with, or that benefit a coalition of one or more community-based organizations as specified in Public Resources Code section 25545.10. Therefore, staff recommends the CEC adopt proposed findings and conclusions consistent with staff's recommendation based on the identified evidence in the administrative record.

Staff notes various commenters who assert that the relatively low dollar amount of the agreement, and the narrow benefit of serving only a union advocacy group in furtherance of a specific type of job development, is disproportionate to the impacts of the project, and is for this reason inadequate. However, the Public Resources Code does not establish a minimum amount of benefit, or require that the benefit be proportional to the impact of the project. Staff acknowledges the comments but does not consider them in its determination that substantial evidence is contained in the record to support a finding that the statutory requirement of the existence of a valid agreement has been met.

10.6 Identification of Public Agencies that Received Notice of the Application

Consistent with Public Resources Code section 25519 and 25545.8, CEC staff notified the following agencies of the opt-in application: Shasta County, California Department of Fish and Wildlife, Department of Toxic Substances Control, State Water Resources Control Board, Central Valley Regional Water Quality Control Board, California Public Utilities Commission, California Attorney General, California Office of Emergency Services, California Department of Forestry and Fire Protection, California Department of Transportation, Native American Heritage Commission, Office of Land Use and Climate Innovation, U.S. Army Corps of Engineers, California State Parks, Bureau of Land Management, and United States Fish and Wildlife Service.

10.7 Environmental Leadership Development Project Requirements

Summary of Requirements

An opt-in application is deemed an environmental leadership development project certified by the Governor and eligible for streamlined procedures,[21] if the CEC verifies that the project meets the conditions under Public Resources Code section 21183 and mitigates greenhouse gas impacts as required under Public Resources Code section 21183.6.[22]

Under Public Resources Code section 21183 the following conditions must be met:

1. The Project will result in a minimum investment of $100,000,000 in California upon completion of construction.
2. The project creates high-wage, highly skilled jobs that pay prevailing wages and living wages, provides construction jobs and permanent jobs for Californians, helps reduce unemployment, and promotes apprenticeship training as defined in Public Resources Code section 21183.5.

21 Pub. Resources Code, §§ 21178 et seq.
22 Cal. Code Regs., tit. 20, § 1877(h); Pub. Resources Code § 25545.13

3. For environmental leadership development projects[23], including a wind or solar energy project or a project that manufactures products, equipment, or components used for renewable energy generation, or energy efficiency, the project does not result in any net additional emission of greenhouse gases, including greenhouse gas emissions from employee transportation, as determined by compliance with Public Resources Code section 21183.6.
4. The applicant demonstrates compliance with the requirements of recycling commercial solid waste and organic solid waste as required under Chapter 12.8 (commencing with Section 42649) and Chapter 12.9 (commencing with Section 42649.8) of Part 3 of Division 30, as applicable.
5. The applicant has entered into an agreement that all mitigation measures required to certify the project must be conditions of approval of the project. For environmental mitigation measures, the applicant agrees that those measures will be monitored and enforced by the lead agency for the life of the obligation.
6. The applicant agrees to pay the costs of the trial court and the court of appeal in hearing and deciding any case challenging a lead agency's action on the certified project.
7. The applicant agrees to pay the costs of preparing the record of proceedings for the project concurrent with review and consideration of the project under this division.
8. The applicant demonstrates that the record of proceedings is being prepared in accordance with Public Resources Code section 21186.

Under Public Resources Code section 21183.6, quantification and mitigation of impacts of environmental leadership development projects[24] including a wind or solar energy project or a project that manufactures products, equipment, or components used for renewable energy generation, energy efficiency, or for the production of clean alternative fuel vehicles from the impacts of greenhouse gases must be as follows:

1. The environmental baseline for greenhouse gas emissions be based on the physical environmental conditions in the vicinity of the project site at the time the application is submitted.[25]
2. The mitigation of the impacts resulting from the emissions of greenhouse gases must be achieved in accordance with the following priority:
    a. Direct emissions reductions from the project that also reduce emissions of criteria air pollutants or toxic air contaminants through implementation of project features, project design, or other measures, including, but not limited to, energy efficiency, installation of renewable energy electricity generation, and reductions in vehicle miles traveled.

23 Pub. Resources Code, § 21180(1), (2), and (3)
24 Id.
25 Cal. Code Regs., tit. 14, § 15125

b. The remaining unmitigated impacts shall be mitigated by direct emissions reductions that also reduce emissions of criteria air pollutants or toxic air contaminants within the same air pollution control district or air quality management district in which the project is located.

c. The remaining unmitigated impacts shall be mitigated through the use of offsets that originate within the same air pollution control district or air quality management district in which the project is located, consistent with the Health and Safety Code[26], including, the requirement that the offsets be real, permanent, quantifiable, verifiable, and enforceable, and shall be undertaken from sources in the community in which the project is located or in adjacent communities.

d. The remaining unmitigated impacts shall be mitigated through the use of offsets that originate from sources that provide a specific, quantifiable, and direct environmental and public health benefit to the region in which the project is located.

Proposed Findings of Fact

Based on the information provided in the application, and additional evidence and information as described below and contained in the record of this proceeding, staff recommends the CEC make the following findings and conclusions because the record contains substantial evidence for their support:

(Public Resources Code section 21183 required proposed findings)

1. The project will result in a minimum investment of $100,000,000 in California upon completion of construction (FWPA, TN 248321).

2. The applicant has identified that construction of the project will generate 71 full-time equivalent jobs annually over the 24-month construction schedule with an estimated peak of approximately 200 workers on-site during peak construction months (FWPA, TN 250915). Operation of the project will employ a fulltime workforce of eight employees over the 35-year expected lifetime of the project and will therefore provide permanent jobs for Californians (FWPA, TN 250915).

   The applicant has certified that these workers will be paid prevailing wages and living wages as evident by their employment agreements (FWPA, TN 248291-2).

   The applicant certifies that it plans to promote apprenticeship training (Stantec 2023d, TN 253611).

3. The proposed project is a wind energy facility and is therefore a qualified environmental leadership development project under Public Resources Code section 21180(b)(1), (2), or (3). As discussed in Staff Assessment **Section 5.3, Climate Change and Greenhouse Gas Emissions**, the project does not result in any net additional emission of greenhouse gases, including greenhouse gas emissions from

26 Pub. Resources Code, § 38500

employee transportation, as determined by compliance with Public Resources Code section 21183.6.

4. The applicant has certified that it will comply with recycling commercial solid waste and organic solid waste requirements under Public Resources Code sections 42649 and 42649.8, as applicable (FWPA, TN 248321). As described in **Section 5.12, Solid Waste Management**, waste management plans would ensure the recycling of project solid waste generated during construction and operation to the greatest extent feasible. Biodegradable waste associated with timber harvesting operations and clearing would also be recycled or reused, with the likely use being that this material will be processed and sold as hogfuel chips to feed biomass energy plants (FWPA, TN 251438).
5. Upon certification of this project the applicant will have entered into an agreement that any and all mitigation measures contained within the Final Decision of certification will be conditions of approval of the project. The CEC will monitor and enforce the mitigation measures for the lifetime of the project.
6. The applicant has agreed to pay the potential costs of the trial court and the court of appeal in hearing and deciding any case challenging the CEC's action on the certified project (FWPA, TN 248742).
7. The applicant has agreed to pay the costs of preparing the record of proceedings for the project concurrent with review and consideration of the project (FWPA, TN 248742).
8. The preparation and certification of the record of proceedings for this project complies with Public Resources Code section 21186.

(Public Resources Code section 21183.6 required proposed findings)

9. The application demonstrates that the environmental baseline for greenhouse gas emissions was based on the physical environmental conditions in the vicinity of the project site when the application was submitted on January 11, 2023.
10. This document requires any and all mitigation measures resulting from the emissions of greenhouse gases to be in accordance with the priorities outlined in Public Resources Code section 21183.6.

Conclusions. Staff has verified and concluded that the record contains evidence to support a finding that the project meets the requirements of, and may be deemed, an environmental leadership development project under Public Resources Code section 21183. In addition, staff has proposed Conditions of Certification (**SOLID WASTE-1**) that require compliance with all mitigation measures required to certify the project, as set forth in this proposed finding.

Staff has also verified and concluded that the record contains evidence to support a finding that the impacts of greenhouse gas emissions were quantified and mitigated in

a manner consistent with Public Resources Code section 21183.6, and therefore staff recommends that the CEC may adopt this proposed finding and conclusion.

10.8 Potential for Restoring the Site if Application Rejected

Summary of Requirements

As part of the opt-in application the applicant must demonstrate the potential for restoring the site as necessary to protect the environment if the CEC denies approval of the application.[27]

Proposed Findings of Fact

Based on the information provided in the application, and additional evidence and information as described below and contained in the record of this proceeding, staff proposes the following findings:

1. Project site preparation and construction would not begin prior to application approval and thus restoration work would not be necessary.

Conclusions. Staff concludes that the applicant has sufficiently evaluated and identified the potential for restoring the project site as required under California Code of Regulations, title 20, section 1879(a)(3) and therefore staff recommends that the CEC may adopt this proposed finding and conclusion.

10.9 Minimum Standards of Efficiency

Summary of Requirements

The applicant must demonstrate compliance with the recommended minimum standards of efficiency for the operation of a new facility at a particular site that are technically and economically feasible, as required under Public Resources Code section 25402(d). The applicant must certify that standards recommended by the CEC have been considered; the certification shall include a statement specifying the extent to which conformance with the recommended standards will be achieved.[28]

Proposed Findings of Fact

Based on the information provided in the application, and additional evidence and information as described below and contained in the record of this proceeding, staff recommends the CEC make the following findings and conclusions because the record contains substantial evidence for their support:

1. The CEC has not recommended minimum standards of efficiency for the proposed project. The applicant is not required to demonstrate compliance with minimum

27 Cal. Code Regs., tit. 20, § 1879(a)(3); Pub. Resources Code, § 25523(e)
28 Cal. Code Regs., tit. 20 § 1879(a)(1); Pub. Resources Code, § 25523(d)

efficiency standards, as no minimum efficiency standards have been applied to this project.

Conclusions. Based on the foregoing proposed findings, the applicant is not required to demonstrate compliance with minimum standards of efficiency, as no efficiency standards have been applied to this project. Therefore, staff proposes the CEC may adopt this finding and conclusion as it is supported by substantial evidence in the record.

10.10 Conformity with Local, Regional, State, and Federal Standards, Ordinances, or Laws

Summary of Requirements

See **Section 11, Override Findings and Recommendations** for a detailed analysis of the project's non-conformance with local laws, and proposed findings supported by substantial evidence regarding the non-conformance.

10.11 References

AQMD 2023 – Shasta County Air Quality Management District (AQMD). SCAQMD ATC Application Completeness Letter, dated August 16, 2023. (Also cited as FWPA TN 251630). Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

AQMD 2024 – Shasta County Air Quality Management District (AQMD). Input on the Opt-in Application for Certification of the Fountain Wind Project, dated February 23, 2024. (Also cited as FWPA TN 254693). Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2024 – California Energy Commission (CEC). Visualization of Seasonal Variation in California Wind Generation. Accessed July 2024. Available online at: https://repository.energy.ca.gov/3D_Visualizations/2014-2022_Monthly_Visualization/2014-2022_monthly.html

CEC 2023e – California Energy Commission (TN 249849). Newspaper Ad Notice, dated April 21, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2023l – California Energy Commission (TN 252955). State Clearinghouse NOP Package, dated November 6, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CEC 2023o – California Energy Commission (TN 253231). Notice of Joint Environmental Scoping and Informational Meeting, dated November 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2023a – County of Shasta (TN 251601). Shasta County Opposition to AB 205 Jurisdiction and Objection to Notice of Completion Request, dated August 14,

2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2023l – County of Shasta (TN 253508). County of Shasta Comments on Notice of Preparation of DEIR, dated December 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024c – County of Shasta (TN 253813). County of Shasta AB 205 Review and Comments on Fountain Wind Community Benefits Agreement Update and Submittal with Exhibits, dated January 5, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024i – County of Shasta (TN 254693). Shasta County Air Quality Management District Input on the Opt-in Application for Certification of the Fountain Wind Project, dated February 26, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024l – County of Shasta (TN 260101). County of Shasta Comments on Wildfire, Economics, and Various Project Environmental Issues, dated November 15, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

COS 2024j– County of Shasta (TN 260646). County of Shasta's AB 205 Continuing Review and Additional Comments on Fountain Wind Project, dated December 13, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248290-4). FAA Determination of No Hazard, dated January 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248291-2). AB 205 Labor Certification, dated January 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 248321). Appendix B Opt-In Application Crosswalk Matrix, dated January 4, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250551). ALT-01_02 Site Selection and Project Objectives, dated June 8, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 250915). Revised Fountain Wind EIA, dated July 3, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251438). LU-001 Fountain Wind Timber Analysis, dated August 1, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 251630). SCAQMD ATC Application Completeness Letter, dated August 16, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

FWPA – Fountain Wind Project Application (TN 254794) Fountain Wind Project Updated Project Description, dated March 4, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Hoen, Ben. 2010. Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices. Accessed online at: https://cloudfront.escholarship.org/dist/prd/content/qt2z14x0kw/qt2z14x0kw.pdf

Hoen, Ben; Jason P Brown, Thomas Jackson, Ryan H Wiser, Mark A Thayer, Peter Capper. 2013. A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States. Accessed online at: https://emp.lbl.gov/publications/spatial-hedonic-analysis-effects-wind

NAWP 2023 – North American Wind Power. Wind Turbines and Fire: Why Take the Risk? March 9, 2023. Ross Paznokas. Accessed online at: https://nawindpower.com/wind-turbines-and-fire-why-take-the-risk

Stantec 2024p (TN 254794). FWP Description Update, dated March 4, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Stantec 2023d (TN 253611). Fountain Wind Community Benefit Agreement, dated December 14, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Section 11

Override Findings and Recommendations

11 Override Findings and Recommendations

Discussion of the Project's Inconsistency with Local Laws and Significant Environmental Impacts and Staff's Recommendation

11.1 Summary of Staff's Recommendations

Staff recommends the CEC not certify the project because the project conflicts with local land use ordinances and substantial evidence supports a finding that the project is not required for public convenience and necessity. Alternatively, if the CEC finds the project is required for public convenience and necessity, staff concludes the record supports a finding that there is a more prudent and feasible means for achieving public convenience and necessity through a project alternative.

Further, the project will result in significant unmitigable environmental impacts and based on substantial evidence in the record, staff recommends the CEC not issue a statement of overriding considerations under CEQA.

Staff's recommendations are based only on the facts in this record and are not intended to be generally applicable to pending or future recommendations regarding other applications for siting certifications made to the CEC.

11.2 CEC's Authority to Approve Projects that are Inconsistent with Local and State Laws

When a project is inconsistent with a local and or state law, the CEC may approve the project only if it makes additional, specific findings set forth in Public Resources Code section 25525:

> The commission may not certify a facility contained in the application when it finds, pursuant to subdivision (d) of Section 25523, that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the commission determines that the facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to, the impacts of the facility on the environment, consumer benefits, and electric system reliability. The commission may not make a finding in conflict with applicable federal law or regulation. The basis for these findings shall be reduced to writing and submitted as part of the record pursuant to Section 25523.

Additionally, if such an inconsistency exists, the Public Resources Code directs the CEC to attempt to resolve the inconsistency, stating: "If the commission finds that there is

noncompliance with a state, local, or regional ordinance or regulation…it shall consult and meet with the…local governmental agency concerned to attempt to correct or eliminate the noncompliance." (Pub. Resources Code § 25523(d)(1).)

Public Resources Code section 25525 anticipates that not all conflicts can be resolved, and, in those cases, the CEC may approve the project, and "override" the inconsistency with local or state law only after finding that the project is required for public convenience and necessity, and no more prudent and feasible alternative is identified.

11.3 Required for Public Convenience and Necessity

The phrase "public convenience and necessity" is not defined in the CEC's enabling statute or regulations, but case law interprets and applies the phrase which also appears in Public Utilities Code section 1001. It is well-settled by judicial decisions construing section 1001 that *"public convenience and necessity"* has a broad and flexible meaning, and that the phrase "cannot be defined so as to fit all cases." *(San Diego & Coronado Ferry Company v. Railroad Commission* (1930) 210 Cal. 504, 511.) "[A]ny improvement which is highly important to the public convenience and desirable for the public welfare may be regarded as necessary. . . The word connotes different degrees of necessity. It sometimes means indispensable; at others, needful, requisite, or conducive. It is relative rather than absolute." (*Id*. At pp. 511 - 512 [emphasis added] [internal quotation marks and citations omitted].)

The factors the CEC considers in assessing public convenience and necessity must be reasonably related to the goals and policies of the CEC's enabling legislation. As the California Supreme Court stated, "[t]he meaning [of 'public convenience and necessity'] must be ascertained by reference to the context, and to the objects and purposes of the statute in which it is found." (*San Diego Ferry*, at p. 512.) The CEC then must weigh the competing interests of public safety and welfare and environmental protection addressed by the inconsistent LORS against the broader and longer-term goals and polices related to Warren-Alquist Act directives and implementing policies, including the purposes of the Opt-in certification program.

While not binding, a review of CEC's past efforts to apply this standard are instructive and provide staff with a useful framework for the current analysis and recommendation. Staff notes that in characterizing the override remedy, the CEC has stated:

> In applying our discretion, we note first that the Commission has consistently regarded a LORS override as "an extraordinary measure which . . . must be done in as limited a manner as possible." (Commission Decision, Eastshore Energy Center, Pub. No. CEC-800-2008-004-CMF, Docket No. 06-AFC-6 (Oct. 2008), p. 453.)

The process of weighing competing interests was articulated in the CEC's *Eastshore* decision,

> therefore, the purposes of any LORS, which we may be asked to override, must be weighed or balanced against the stated goals and policies of the Warren-Alquist Act and the consequences of the override assessed. In other words, we must make a judgment, based upon the unique fact situation before us, which of the competing public purposes is paramount. Is it more important and/or beneficial to the public to positively affect the supply of electricity or is the public interest best served by declining to override and thus avoid hindering the purposes of the LORS in question? (Commission Decision, Eastshore Energy Center, Pub. No. CEC-800-2008-004-CMF, Docket No. 06-AFC-6 (Oct. 2008), p. 455.)

Geographic considerations are also relevant to public convenience and necessity determinations. In its *Los Esteros* decision, the CEC considered regional and statewide electricity considerations as follows:

> The statute does not, however, focus on public convenience and necessity solely in a limited geographical context. Rather, the focus is on electricity's essential nature to the welfare of the state as a whole. This logically not only includes a specific area, but also recognizes the interconnected nature of the electrical grid and the interdependence of the people and the economy in one sector of the state upon the people and the economy in the balance of the state. The Commission's 2005 Integrated Energy Policy Report conclusively established that substantial additions to the state's generating system are needed. Since the LECEF will provide a portion of the electrical energy supply essential to the well-being of the state's citizens and its economy, we conclude that this project is required for public convenience and necessity within the meaning of section 25525. (Commission Decision, Los Esteros Critical Energy Facility II Phase 2, Pub. No. CEC-800-2005-004-CMF, Docket No. 03-AFC-2 (Oct. 2006), p. 368.)

As with these prior decisions, current goals and objectives related to the CEC's statutory mandates and related state policies include grid reliability, renewable energy development, reduction in greenhouse gas emissions, environmental protection, and consumer benefits. The CEC must identify the degree to which the project furthers these statewide goals balanced against the purpose and benefits of the local LORS, including land use planning, environmental protection or public health and safety.

If substantial evidence shows the project advances stated policy directives and the local LORS do not present greater counter balancing benefits, the project can be deemed required for public convenience and necessity.

11.4 Evidence in the Record Relevant to LORS Override

The project is inconsistent with Shasta County Code section 17.88.335 which prohibits large wind facilities in unincorporated areas of the Shasta County, section 17.08.010, which establishes timber production zones, such as the project site, for timber harvesting, and the Scenic Highways Element of the Shasta County General Plan which

is intended to establish and protect State or county roads with scenic value. (See Land Use, Visual Resources and Forestry Sections, 5.8, 5.15, and 5.17.)

The record establishes Shasta County's express and consistent opposition to the project. Shasta County denied the Fountain Wind project and subsequently amended its zoning laws before the applicant filed an application with the CEC, and adopted additional requirements after the applicant filed its application with the CEC. The project's noncompliance with local zoning laws has not been corrected or eliminated. (See Shasta County Opposition to AB 205 Jurisdiction and Objection to Notice of Completion Request, TN 251601 and Shasta County's Comments on Notice of Preparation of DEIR, TN 253508.)

Since the conflicts cannot be resolved, staff evaluated whether the project meets the standard of "public convenience and necessity".

Staff notes that the County in its comments on the Notice of Preparation, stated the following, which does not accurately reflect the legal standard:

> Lastly, the County has reviewed the CEC's prior decisions and legal opinions on public convenience and necessity and the so-called "LORS override." An extensive review shows that the CEC cannot make the required findings based on statutory language, relevant case law, and prior agency precedent, and importantly, the unique facts and circumstances of the project.
>
> In preparing the staff assessment on this issue, the CEC must use and identify a threshold for renewable energy achievement, GHG reduction, consumer benefits and grid reliability that is objective, measurable and verifiable by the public as well as data that is publicly available and docketed (not just in the "project file"). The public convenience and necessity analysis must be transparent and information submitted by the applicant that is not in the docket is not. (Shasta County's Comments on Notice of Preparation of DEIR, TN 253508.)

In performing a LORS override analysis, the CEC is not required to develop specific thresholds for renewable energy, GHG reductions, consumer benefits or grid reliability. As noted above, "public convenience and necessity" has a broad and flexible meaning and Public Resources Code section 25525 directs the CEC to consider the entire record of proceeding when deciding on a LORS override, which necessitates a project specific approach.

In assessing the verifiable benefits and protections aligned with the Warren-Alquist Act and resulting from the project, staff has, when available, identified objective metrics from information in the docket or public data sets accessible through the web, including quantities of renewable energy generation, state renewable energy and GHG targets, alternatives to the project, socioeconomic data, project costs, wind performance data. etc.

11.5 Purpose of the Shasta County Ordinance SCC 2023-01

Shasta County Code, section 17.88.335, which was amended under Ordinance SCC 2023-01, prohibits the issuance of a permit or approval of any large wind systems in unincorporated areas of Shasta County. (See Section 5.8 Land Use.) The stated purpose in the ordinance is to protect and promote the public health, safety, and general welfare of the County's citizens. The ordinance also contains findings that describe other reasons for the prohibition, including the adverse impacts of large wind energy systems with respect to wildfire, aerial firefighting, aesthetics, biological resources, and historical, cultural, and tribal resources, as well as the fact that most areas subject to this ban are in high and very high fire hazard zones as designated by the California Department of Forestry and Fire Protection.

With regards to wind systems in these fire zones, the ordinance finds that large wind energy systems are incompatible in the high and very high fire hazard severity zones. The ordinance also finds that due to the identified impacts, the construction or operation of large wind energy systems will not have an overall net positive economic benefit to Shasta County.

In sum, the ordinance can reasonably be read as a public health, safety and environmental protection law seeking to address articulated concerns and impacts related to the placing of large turbines in a mountainous forest prone to wildfires.

11.6 Purpose of the Shasta County Code Section 17.08.010, Timber Production

The project's current zoning designation as a timber production (TP) district is incompatible with development of this project, and the project site zoning would need to be revised to allow for this industrial use. (See Section 5.17 Forestry Resources.) The purpose of the TP district is to preserve lands devoted to and used for growing and harvesting timber, that meet the requirements of the California Timberland Productivity Act of 1982 (Gov. Code § 51100 et al.), and to provide for uses compatible with growing and harvesting timber.

The California legislature states in section 51101 of the Timberland Protection Act,

> the forest resources and timberlands of this state, together with the forest products industry, contribute substantially to the health and stability of the state's economy and environment by providing high quality timber, employment opportunities, regional economic vitality, resource protection, and aesthetic enjoyment... A continued and predictable commitment of timberland, and of investment capital, for the growing and harvesting of timber are necessary to ensure the long-term productivity of the forest resource, the long-term economic viability of the forest products industry, and long-term stability of local resource-based economies.

As described in the Forestry Resources section, timberland is rated for productivity based upon five classes by California Board of Forestry and Fire Protection regulation. Site Class I denotes sites of high productivity, Site Class II and Site Class III denote sites of intermediate productivity potential, and Site Class IV and Site Class V denote sites of lowest productivity potential.

The project site is primarily Site Class I, with some areas of Site Class II. Thus, the site is a productive timberland and one the county seeks to preserve for timber production through Shasta County Code section 17.08.010 which establishes the process for designating sites as timberland production districts also known as timberland production zones under the Timberland Protection Act. Timberland production zones are areas, such as the project site, which have been zoned pursuant to Government Code sections 51112 or 51113 and are devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses.

Under the current project, the total area of project-related disturbance is anticipated to be 1,058 acres within the 2,855-acre project site, of which 510 acres would be permanently disturbed with tree removal, and another 548 acres would be temporarily disturbed.

Thus, Shasta County has identified a highly productive timber production site and sought to take advantage of this productivity by limiting the site's use to timber operations in furtherance of the state goals under the Timberland Productivity Act.

11.7 Purpose of the Scenic Highways Element in the Shasta County General Plan

The scenic highways element in the Shasta County General Plan helps contribute to the present and future protection of the County's scenic environment from certain roadways. Land uses which impair the visual quality of official scenic highways can be controlled limiting the construction of large buildings or facilities, various types of large unscreened outdoor storage areas, non-landscaped parking lots, and the siting of billboards or other off-premises signs. These activities tend to conflict with the surrounding natural environment and restrict views of distant features such as mountains and lakes.

Scenic highways and their associated corridors enhance the tourist industry of Shasta County. For many visitors, highway corridors will provide their only experience of Shasta County. Enhancement and protection of these corridors ensures that the tourist experience continues to be a positive one and, consequently, provides support for the tourist-related activities of the County's economy. To implement the scenic element, Shasta County has devised the following provisions, along with the County development standards, that govern new development:

- setback requirements
- regulations of building form, material, and color

- landscaping with native vegetation, where possible
- minimizing grading and cut and fill activities
- requiring use of adequate erosion and sediment control programs
- siting of new structures to minimize visual impacts from highway
- regulation of the type, size, and location of advertising signs
- utility lines shall be underground wherever possible; where undergrounding is not practical, lines should be sited in a manner which minimizes their visual intrusion."

(Shasta County General Plan, Scenic Highways Element, pp. 6.8.05 to 6.8.06)

11.8 State and Federal Endangered Species Acts, Migratory Bird Act, Bald and Golden Eagle Protection Act, Furbearing Mammals Act, Clean Water Act, Non-Conformance

In addition to the definitive land use non-conformance, previously discussed, the project may violate multiple statutory provisions governing the taking of protected species and protection of state and federal waters. As noted in Section 5.2.3 of the Biological Resources analysis, operation of the project has the potential to enhance the spread of wildfires across the project site and to adjacent national forests lands. These fires may result in unanticipated and potentially catastrophic impacts to a variety of sensitive plants and wildlife. Staff considers these impacts to be significant and unavoidable impacts for some species that are listed as federally threatened or endangered. In addition, these fires can result in the destruction of habitat supporting these species. The potential statutory non-conformance occurs because take permits do not allow for species mortality or habitat loss due to accelerated wildfire spread. In addition, impacts to jurisdictional waters and wetlands of the state from an uncontrollable wildfire would be significant and unavoidable and also inconsistent with the state and federal Clean Water Acts.

11.9 Stated Goals and Polices of the Warren-Alquist Act

After considering the purpose of the conflicting local laws, next the goals and related polices of the CEC's implementing statute, the Warren-Alquist Act, must be considered. Since its inception, the CEC has been charged with the mandate to ensure energy generation development for a reliable electricity supply to promote public health, safety and general welfare as well as ensure resource conservation and environmental protection. This dynamic of conservation and development is reflected in the CEC's formal name, State Energy Resources Conservation and Development Commission. (See, Public Resources Code sections 25001, 25007, and 25104.) California is undergoing an historic transition away from a fossil fuel-based energy system encompassing both electricity generation and transportation to a renewable energy-based system anchored with carbon free resources such as solar, wind, geothermal and other technologies supported by large amounts of energy storage.

In 2018, Senate Bill 100 was passed which among other things amended the Public Utilities Code accelerating the energy transition by requiring 50% of all retail sales of electricity be from renewable resources by December 31, 2026, 60% by December 31, 2030, and by December 31, 2045, 100% of all retail sales be from renewable and zero carbon sources. (See, Public Utilities Code sections 399.15(b)(2)(B) and 454.53(a).) SB 100 also requires the Energy Commission, Public Utilities Commission and Air Resources Board to use programs under existing laws to achieve these clean electricity targets and issue a joint policy report on SB 100 by 2021 and every four years thereafter. (See, Public Utilities Code section 454.53(d).)

The 2021 SB 100 report has several key findings including the need for bold action to decarbonize as, "Californians experienced the damaging effects of climate change as never before: a historic siege of wildfires and smoke, and a record-breaking heat wave. Scientists worldwide agree that without bolder mitigation measures, climate-related disasters will recur with increasing frequency and greater devastation." (2021 SB 100 Joint Agency Report Summary Achieving 100% Clean Electricity in California, Docket No. 19-SB-100 (March 2021), p. 3. https://efiling.energy.ca.gov/GetDocument.aspx?tn=239588&DocumentContentId=73021.)

A major finding in the report is that construction of clean electricity generation and storage facilities must be sustained at record-setting rates. (2021 SB 100 Joint Agency Report Achieving 100 Percent Clean Electricity in California: An Initial Assessment, Pub. No. CEC-200-2021-001, Docket No. 19-SB-100 (March 2021), pp. 17 and 22. https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity.) Specifically, the 2021 report estimated the following build-out by 2030 is required to meet the ultimate 2045 targets: The addition of 16.9 GW of utility scale solar, 9.5 GW of battery storage and 8.2 GW of terrestrial wind. On average, the state will need to build 6 GW of new solar, wind and battery storage resources annually. (See, Modeling Results and Build Rates Summary for 2021 SB 100 Joint Agency Report Summary Achieving 100% Clean Electricity in California, p. 10. https://efiling.energy.ca.gov/GetDocument.aspx?tn=239588&DocumentContentId=73021.) While these numbers reflect information at the time of the report and are expected to change over time, the message is clear, a major buildout on all fronts will be necessary to add to the existing 20,000 MW plus of utility scale renewable energy on the transmission system. (https://www.caiso.com/todays-outlook/supply. See for example June 29, 2024, where renewable generation peaked at 3:20pm reaching 22,708 MW.)

Thus, an important driver of reaching the SB 100, 2030 and 2045 targets is the rapid construction and operation of solar, wind and battery systems. In considering whether the Fountain Wind project is needed for public convenience and necessity one question to address is the project's contribution to the renewable and carbon free energy targets

set forth in SB 100, considering current renewable generation capacity and expected future renewable energy and storage projects.

The Fountain Wind project would potentially contribute 205 MW to the 8,200 MW targets identified in the SB 100 report for terrestrial wind. For comparison the existing, Ocotillo Express Wind facility is 265 MW, Manzana Wind is 189 MW, and Alta V Wind Energy is 168 MW. (California Energy Commission 2022. 3-D Interactive Visualization of California Wind Generators. Data last updated December 7, 2022. Accessed December 11, 2024, from Quarterly Fuel and Energy Reports (QFER) Data Tables. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/3-d-interactive-visualization-california.) It should be noted that these other projects are in wind resources areas that support multiple projects. When viewed on a wind resources area basis, the dominant regions identified in the CEC visualization data, with total area capacity, include Altamont (325 MW), East San Diego County (447 MW), San Gorgonio (591 MW), Solano (1026 MW), and Tehachapi (3575 MW). Shasta County is not identified as a major wind resources area with only the single Hatchet Ridge project at 100 MW.

While project capacity, in this case 205 MW, is important when considering the project's public convenience and necessity, capacity factor is also important. As detailed in Section 4.2 Facility Reliability, the applicant has indicated in its project description that the proposed project has an expected capacity factor, or percentage of time operating at maximum output, of 26-32 percent. Data from the CEC's wind database shows this range is comparable to some other wind farms, including the nearby Hatchet Project which had an overall 2022 capacity factor of 31 percent. (*Id.*)

The best performing wind farms in the state, located in the Tehachapi, Monterey, Altamont, San Gorgonio, and San Diego can hit an annual capacity factor of 40-50 percent. (*Id.*)

The proposed site location is not within one of the previously identified and established wind resources areas and the project's expected capacity factor will be lower than other projects located in the state's traditional wind resources areas. The applicant has indicated that:

> to the Applicant's knowledge, the Fountain Wind Project is the only greenfield, utility-scale wind energy project currently under review by any permitting entity in California. This is the case not because there is no market for wind energy in the state, but because there are very few available sites suitable for new utility-scale wind energy in California. (See Responses to Data Request ALT-01 and ALT-02, TN 250551)

Staff reviewed two public data sets from the CalISO showing interconnection requests up through what is called cluster 15. One data set is titled *The California ISO Controlled Grid Generation Queue for All: Active* and identifies solar, wind, and battery storage projects that have completed phase I interconnection studies and either have

completed phase II studies or such studies are pending. The second data set is titled *Cluster 15 Interconnection Requests* which contains recent interconnection requests that have not yet received completed phase I studies. While not all of these projects will come to fruition and some projects have been in the generation queue for many years, the number and size of the projects can provide an understanding regarding the overall energy landscape including which technologies are poised to be most rapidly installed, and the number and type of potential projects in the pipeline that can contribute to the state's renewable energy and GHG emission reduction 2030 and 2045 targets set forth in the 2021 SB 100 report. (See the CalISO Public Project Queue Report- *The California ISO Controlled Grid Generation Queue for All: Active* and *Cluster 15 Interconnection Report*
https://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx.)

Based on the CalISO's interconnection data, 16 onshore wind projects have submitted interconnection requests since 2016. These include the following projects: 408 MW Potentia-Viridi project, 400 MW Mount Laguna Wind 2 project, 212 MW Ventoso project, 105 MW Boulder Brush Hybrid project, and the 92 MW Solano 4 Wind project.

In contrast to the number of proposed wind projects, the Grid Generation Queue and Cluster 15 Interconnection report identify over 200 solar PV projects, many of them with battery storage and over 300 battery-only proposed energy storage projects. Based on this CalISO data, and to the extent existing wind farms do not plan to repower with larger turbines as discussed in the Alternatives section, the more limited number of proposed onshore wind projects does increase the importance of each project's contribution to the current SB 100 Joint Report 2030 wind generation targets. But, as also discussed in the Alternatives section, accelerating battery energy storage system installations, now at over 8000 MW, is also needed to meet energy goals. (https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-storage-system-survey.)

In addition to the stated goals and polices of the Warren Alquist Act, the CEC has engaged with relevant California Native American tribes, as required under the Public Resources Code. (Pub. Resources Code §§ 21080.3.1 and 25545.7.4.) For this LORS override analysis, the position of the Pit River Tribe regarding the project, including any information on how the project uniquely effects local tribal cultural resources, is a necessary consideration in determining the public convenience and necessity of a project. The Cultural Resources section details staff's analysis and the consultation process CEC held with tribal leadership consistent with CEQA and the CEC's 2022 Tribal Consultation Policy. The 2022 Tribal Consultation Policy states, "It is the CEC's policy that its consultations with Tribes will occur early and often and be meaningful, respectful, and inclusive." (California Energy Commission Tribal Consultation Policy, Pub. No. CEC-700-2022-001 (November 2021), p. 6.
https://www.energy.ca.gov/sites/default/files/2022-02/CEC-700-2022-001.pdf.) The 2022 Tribal Consultation Policy also acknowledges that "Tribes and tribal communities

possess distinct cultural, spiritual, environmental, economic and public health interests, and unique traditional cultural knowledge about California resources." (*Id.* at p. 2.)

After assessing the purpose of the Shasta County zoning laws and the goals and objectives of the Warren Alquist Act, Public Resources section 25525 requires the CEC to consider the project's impacts on the environment, consumer benefits, reliability, and other related policy considerations.

11.10 Environmental Impacts

The project's environmental impacts are also a factor when considering whether a project is necessary for public convenience and necessity.[1]

As detailed in this environmental impact report, the project presents significant unmitigable impacts in the areas of biological resources, visual resources, cultural and tribal cultural resources, wildfire, forestry resources, and land use. Many of these technical areas are the same as those Shasta County Ordinance SCC 2023-01 and Shasta Code section 17.08.010 were passed to protect. It is notable that there is concurrence between the environmental impact report analysis finding significant impacts and the purpose of the ordinance to prevent these significant impacts. Thus, the broader findings of Shasta County regarding the impacts of large wind facilities in unincorporated areas of the county, are confirmed at a project specific level.

Regarding tribal cultural resources, as part of the consultation process the Pit River Tribe has indicated through numerous filings in the record that the tribe opposes the project which will be located on the tribe's ancestral lands. In a letter dated October 17, 2023, the tribal chairperson stated:

> Tribal members will be immediately adversely impacted by the construction of this project in many ways including, but not limited to, mental and physical health, land health, watershed health, ground instability which triggers landslides, limited access to sacred waters and springs, impacts to cultural resources, and permanent damage and destruction to traditional historical areas integral to the identity of the Pit River People that cannot be mitigated. These adverse impacts would continue long after decommissioning of the project on the land… The topography of the Project Site is central to the Tribe's identity, oral traditions, and history. Changing the landscape so drastically is another state-sanctioned action (under AB 205) that leads to dispossession of homelands and is yet another attempt to erase our people from history." (Pit River Letter, Docket No. 23-OPT-01, TN 252625, pp. 3-4.)

1 This is in addition to the requirements under California Code of Regulations, title 14, sections 15091 and 15093 for an agency to make certain findings to approve a project that causes significant unavoidable impacts to the environment (See section 11.19 below for a detailed discussion on CEQA overriding considerations).

Again, staff's conclusions regarding significant unmitigable impacts to tribal cultural resources is consistent with both the purpose of the ordinance and clear articulations by tribal leaders.

The aggregation of multiple significant environmental impacts and impacts to tribal cultural resources detailed in the environmental impact report provides substantial evidence of burdens occasioned by the project that must be carefully considered when assessing whether the project is needed for public convenience and necessity. Because the environmental impacts identified are also significant and unmitigable under CEQA, staff recommends the CEC give significant weight to the environmental considerations when balancing the local zoning laws with the project's support of renewable energy goals.

11.11 Consumer Benefits

The substantial evidence in the record regarding local and statewide consumer benefits resulting from the project is another factor to be considered when determining whether the project is required for public convenience and necessity.

The Socioeconomic, Alternatives, and Mandatory Opt-In sections contain a detailed assessment of the local benefits to the region from temporary construction jobs, operational jobs, property and sales tax, and other local benefits directly or indirectly attributed to the project. The bulk of the consumer benefits identified relate to local temporary employment for the construction of the facility and local tax revenue associated with the project.

As detailed in **Section 5.11, Socioeconomics**, page 5.11-8, construction of the proposed project is anticipated to last 24 months and employ an average of 71 full-time equivalent construction workers annually. There would be an estimated peak of approximately 200 workers on-site during peak construction months. Operations is expected to employee eight full time workers.

Consumer benefits associated with employment would be moderate during the construction phase given the average of 71 workers during the two-year period. With only eight full time workers during operations, employment related local consumer benefits would be minimal. For context, the 2020, total employment for construction occupations within the Shasta County area was 4,060 workers with a projected increase by 2030 to 4,888 workers. (**Table 5.11-3**)

Page 5.11-1, notes that California Department of Transportation's Shasta County Economic Forecast shows that construction employment trends in Shasta County have increased over the last decade, expanding faster than any other sector in the County. Additionally, the forecast states that as of 2022, the local construction workforce was fully employed and predicts that total construction employment will remain at elevated levels throughout the forecast period (through 2027), but construction firms will struggle to hire and grow (CA DOT 2022).

While projects that create income generation are important, based on the number of overall temporary and permanent jobs coupled with the current and projected low unemployment of the local construction workforce, the project's local consumer benefits related to employment are not significant.

Other local consumer benefits are identified by the applicant in a revised economic impact assessment (see TN 250915). Potential local benefits from the project include total construction-related economic output for Shasta County from direct, indirect, and induced effects is estimated to be about $60 million. Total operation-related economic output for Shasta County from direct, indirect, and induced effects is estimated to be about $6 million each year during its 35-year lifetime.

According to the project's economic impact assessment, the project is estimated to generate approximately $60 million in property tax revenues over the life of the project (2021-dollar terms), which is an average of about $1.7 million annually. Under current tax allocation factors from the Shasta County Auditor-Controller Office, about $7.5 million of the project lifetime total would accrue to the county, $4 million to cities, $3.6 million to special districts, $8 million to Redevelopment Property Tax, $9 million to the Educational Revenue Augmentation Fund, and $28 million to schools (see TN 250915).

While the applicant's economic impact assessment identified various revenues for the local government, the assessment did not include offsetting costs of the project on local government such as from lost tourism, reduced forestry production, damage to roads and wildfire impacts attributed to the project. Net benefits to Shasta County from the project are addressed in **Section 10, Mandatory Opt-In Requirements**. Shasta County identified direct wildfire impacts from the project and increase in fire insurance premiums as significant costs to the county associated with the project. (TN260101) As noted in **Section 10**, staff considered multiple scenarios of project costs to the County and concluded the project would have a net economic benefit to the County.

As described in **Section 5.11, Socioeconomics**, another form of local consumer benefit to consider is the applicant's executed agreement with the Northeastern California Building & Construction Trades Council where the applicant would provide $175,000 for workforce training and development purposes (Stantec 2023d). A second local community benefits agreement includes $2,000,000 for scholarships and worker training within the community. (TN 256472.)

Outside the region, there are no specific identified consumer benefits from the project beyond the general statewide contribution to overall renewable generation which was covered in the prior section regarding the project's contribution to renewable energy goals.

11.12 Reliability

Reliability is an evaluation of the robustness of the state's electrical system, the grid, and the project's impact on that system. (See Public Resources Code section 25525.) As

discussed in the Alternatives section at page 8-47, no evidence in the record indicates that the region around the project has a reliability deficit, vulnerability or weakness addressed by the project. The applicant noted the site was selected because of access to the land and wind resources, not due to any reliability need and that the power would enter the general transmission system - not be provided specifically for local consumption (TN 250551).

The CAISO's 2024 Local Capacity Technical Report (https://www.caiso.com/InitiativeDocuments/Final-2024-Local-Capacity-Technical-Report.pdf) did not identify the area around the proposed project as an area that requires local generation. The Fountain Wind Project is not located in a local reliability area. And while a new generator will typically help support the local grid, grid support is not critical to the area around the Fountain Wind project. But as discussed in detail in Chapter 4.3 Transmission System Engineering, the project can be reliably connected to the PG&E grid with minimal transmission upgrades.

In considering how the project might assist more general grid reliability, staff considered the potential generation profile of the facility compared with likely time periods of potential grid stress which is typically in early evening during summer heat waves as solar generation comes offline. (See **Section 8, Alternatives**.) As described in **Section 8, Alternatives** on pages 8-47 to 8-48, the nearby Hatchet Ridge Wind facility has a lower capacity factor in the summer than its annual average of 32%. Thus, the Fountain Wind project's expected contribution to broader grid reliability during the summer net peak time of 4:00 p.m. to 9:00 p.m. will be less than its overall annual expected energy contribution.

In prior CEC decisions that addressed LORS overrides, the CEC found the required public convenience and necessity when the project was an important asset for local or regional reliability, the project did not otherwise have significant environmental impacts, and the relevant LORS inconsistency imposed a local preference to have some other type of development at the project site. (See, the following CEC decisions *Los Esteros,* Docket 03-AFC-02 TN 38207, *and Carlsbad*, Docket 07-AFC-06 TN 66218.) The *Eastshore* decision, Docket 06-AFC-06 TN 48664, provides an example of a situation where the CEC did not find public convenience and necessity because the project's natural gas derived electricity had only modest local system benefits and the inconsistent local LORS related to public safety.

Based on the entire record, the present project is not designed or located to address any acute reliability needs that would reduce the risk of power loss for the local community. While the project would contribute renewable energy to the wider grid, the expectation that the facility's capacity factor will be lower in the summer, a time when grid stress is most likely to occur, supports the conclusion that reliability benefits of the project are not significant. Last, wind is an intermittent resource, and in contrast to solar and BESS resources, does not fill any specific reliability need locally or to the grid

beyond providing electricity when the wind is adequate. For these reasons, staff considers the reliability of the project to provide a modest benefit.

11.13 Other Relevant State Policy Considerations

In addition to considering the impacts of the project on the environment, consumer benefits, and electrical system reliability, the CEC may consider other relevant factors when assessing whether the project is required for public convenience and necessity. Through staff's independent analysis and consultation staff has identified other pertinent laws and policies that should be considered when determine whether the project is required for public convenience and necessity. This section describes how the project impacts the advancement of statewide policies that are important to the CEC.

During a January 11, 2024, consultation with members of the Pit River Tribe, the tribe asserted that the proposed project conflicts with the State's 30-by-30 Initiative, Truth and Healing Council, and Land-Back initiative. (See the Cultural Resources Section. See also the Pit River Tribe comments filed March 29, 2024, TN 255333.) In addition, because the project site is a forest, consideration must be given to the Natural Working Lands program under AB 1757 signed into law in 2022.

In 2020, Executive Order N-82-20 established the 30-by-30 Initiative with the goal of conserving 30% of California's lands and coastal waters by 2030. In 2023, the 30-by-30 goal was codified into statute by SB 337 amending Public Resources Code section 71450 to read, "It is the goal of the state to conserve at least 30 percent of California's lands and coastal waters by 2030."

The purpose of the 30-by-30 initiative as stated in the Executive Order is to support the global effort to combat the biodiversity and climate crises. Specifically, the Executive Order directs CNRA, among other things, to strategically prioritize investments in cooperative, high-priority actions that promote biodiversity protection, habitat restoration, wildfire-resilient, sustainably managed landscapes, and other conservation outcomes and to implement actions to increase the pace and scale of environmental restoration and land management efforts by streamlining the State's process to approve and facilitate these projects. (https://www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-.pdf)

The 30-by-30 initiative includes sustainably managed private grazing lands, ranches, and working forests with formal durable protections for biodiversity such as conservation or mitigation easements. (Pathways to 30X30 California Accelerating Conservation of California's Nature, April 22, 2022. p. 27 https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/30-by-30/Final_Pathwaysto30x30_042022_508.pdf)

The project's removal of over 500 acres of forest at the project site, precludes the possibility of at least a portion of the working forested land participating in the California's 30-by-30 initiative. Thus, the 30-by-30 initiative (Public Resources Code

section 71450) is a relevant consideration when evaluating the public convenience and necessity of the project. Reducing the size of working forest lands in Shasta County impedes the purpose of the 30-by-30 initiative.

The Truth and Healing Council was created by Executive Order N-15-19 with a stated purpose,

> ...to bear witness to, record, examine existing documentation of, and receive California Native American narratives regarding the historical relationship between the State of California and California Native Americans in order to clarify the historical record of this relationship in the spirit of truth and healing...The Truth and Healing Council shall consult with California Native American tribes to shape the overarching focus and develop the work of the Council and shall endeavor to accurately represent the diversity of experience of California Native Americans within the State of California." (Executive Order N-15-19 sections 2-3, https://www.gov.ca.gov/wp-content/uploads/2019/06/6.18.19-Executive-Order.pdf.)

The goals of the Truth and Healing Council are in part met through the extensive consultation with the tribe as described in the Cultural Resources section.

The Land-back Initiative is a program related to both the ongoing truth and healing process and AB 1757 (discussed below). Through the Land-back Initiative California is supporting the return of over 38,000 acres of ancestral land to tribal stewardship and advancing nature-based solutions projects on tribal lands. (https://www.gov.ca.gov/2024/04/26/a-step-towards-healing-and-restoration-california-to-support-the-return-of-ancestral-tribal-lands-and-lands-management-projects/)

The Pit River Tribe indicated that the tribe is participating in this program pursing a Tribal Nature-Based Solution Grant application submitted to CNRA. This application would fund the acquisition of 576 acres of ancestral land that is adjacent to the proposed project. The tribe highlights the conflict between the state seeking tribal stewardship of land while also considering a project that in the tribe's view is destructive to the same area. (See also the Pit River Tribe comments filed March 29, 2024, TN 255333.)

While the project site is not currently subject to the Land-back Initiative, its proximity to land that is in the process of being returned to the tribe through state funding demonstrates the state policy reflecting the benefits of land in the project region being stewarded for preservation in non-industrial state. This expression of a state recognized benefit is a factor to consider when evaluating the merits of overriding the local ordinance that seeks in part to address impact to the tribal community, the use of the lands for forestry, and reduction of harm to the natural environment and the local population.

Related to Shasta County's code section 17.08.010 and the creation of timber production districts to implement the state's Timberland Productivity Act of 1982, AB

1757 added Health and Safety Code section 38561.5(b)(1) which requires the Natural Resources Agency to identify an ambitious range of targets for natural carbon sequestration, and for nature-based climate solutions, that reduce greenhouse gas emissions for 2030, 2038, and 2045 to support state goals to achieve carbon neutrality and foster climate adaptation and resilience. Health and Safety Code section 38561.5(a)(2) defines "nature-based climate solutions" as activities, such as restoration, conservation, and land management actions, that increase net carbon sequestration or reduce greenhouse gas emissions in natural and working lands.

Forests, including lands subject to timber harvesting, have been identified as a key landscape to facilitate nature-based climate solutions with a total of 165,000 acres a year subject to working forest conservation utilizing practices that enhance carbon sequestration and another 55,000 acres a year subject to preservation. (*Nature-Based Climate Solutions-California's Nature-Based Solutions Climate Targets*, April 22, 2024, p.15. https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Expanding-Nature-Based-Solutions/Californias-NBS-Climate-Targets-2024.pdf.)

The following forestry priority actions have been identified by the state in the 2022 report, *Nature-Based Climate Solutions- Natural and Working Lands Climate Smart Strategy:*

A. Protect resilient forests and large trees and advance proactive vegetation management in more vulnerable stands, using forest thinning, which includes methods such as prescribed and cultural burns and managed natural wildfire, to reduce the risk of catastrophic wildfire, increase resilience to future drought, increase carbon sequestration rates, and stabilize carbon storage.

B. Increase active reforestation efforts in areas recovering from severe wildfires and suffering from reduced natural regeneration as a result. Timely post-wildfire reforestation efforts can also prevent conversion of forest to shrublands and reduced water storage capacity in watersheds.

C. Protect and restore riparian forest ecosystems to enhance carbon storage, protect biodiversity, and expand wildlife corridors and climate migration pathways for native species.

D. Reconnect aquatic habitat within forests to help fish and wildlife endure drought and adapt to climate change.

E. Increase voluntary cultural easements for cultural burns and to ensure California Native American tribes have access to natural cultural resources and cultural landscapes (*Nature-Based Climate Solutions- Natural and Working Lands Climate Smart Strategy,* April 22, 2022, pp. 24 to 26. https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Expanding-Nature-Based-Solutions/CNRA-Report-2022---Final_Accessible.pdf.)

The project's location and its removal of over 500 acres of high productive forest, as described in the Project Description and Forestry Resources sections, implicate state

efforts under the Timberland Productivity Act of 1982 and AB 1757 to conserve forest and to practice active forestry operations in a manner that enhances carbon sequestration and ameliorate effects of climate change wrought by burning fossil fuels. The objectives and goals of California's natural and working lands program and the other related policies described here demonstrate recognized benefits to retaining the current forested condition of the project site. Reducing the benefits of the existing forest by approving the project reduces the GHG benefit of the project. In this way, these climate resiliency policies and statutes run counter to a determination that the project is required for public convenience and necessity.

11.14 Proposed Findings of Fact Regarding Whether the Project is required for Public Convenience and Necessity

Based on the entire record of the proceeding staff proposes the following findings of fact.

1) The project is inconsistent with Shasta County Code section 17.88.335 which prohibits large wind facilities in unincorporated areas of the county, section 17.08.010 which authorizes the creation of timber production districts such as on the project site, and Shasta County General Plan, Scenic Highways Element.
2) The project's noncompliance with zoning laws has not been corrected or eliminated given Shasta County's opposition to the project.
3) The first requirement Under Public Resources Code section 25525 is that the CEC may not certify a facility that does not conform with applicable laws unless the CEC determines that the facility is required for public convenience and necessity.
4) There is no enacted definition of "Public Convenience and Necessity" in statute, regulation, or case law.
5) In determining whether a project is necessary for "Public Convenience and Necessity", the CEC has previously compared the project's ability to further the stated goals and policies of the Warren-Alquist Act to the purpose and benefits of the conflicting law at issue. There is no reason evident in this record suggesting this method of assessing the public convenience and necessity of a project would be inappropriate.
6) The stated purpose in the Shasta County ordinance for the prohibition on large wind facilities is to protect and promote the public health, safety, and general welfare of the county's citizens.
7) Other findings contained in the Shasta County ordinance include adverse impacts of large wind energy systems, with respect to wildfire, aerial firefighting, aesthetics, biological resources, and historical, cultural and tribal resources.
8) Most areas subject to the large wind facility ban are in high and very high fire hazard zones as designated by the California Department of Forestry and Fire Protection.

9) With regards to wind systems in these fire zones, such as the project, the Shasta County ordinance finds that large wind energy systems are incompatible in the high and very high fire hazard severity zones.

10) The Shasta County ordinance also finds that due to the identified impacts, the construction or operation of large wind energy systems will not have an overall net positive economic benefit to Shasta County.

11) The project site is considered productive timberland and designated primarily Site Class I, with some areas of Site Class II and zoned for timber production through Shasta County Code section 17.08.010.

12) The stated goals and policies of the Warren-Alquist Act the project contributes to includes the SB 100 targets of requiring 50% of all retail sales of electricity be from renewable resources by December 31, 2026, 60% by December 31, 2030, and by December 31, 2045, 100% of all retail sales be from renewable and zero carbon sources. (See Public Utilities Code sections 399.15(b)(2)(B) and 454.53(a).)

13) SB 100 also requires the Energy Commission, Public Utilities Commission and Air Resources Board to issue a joint policy report on SB 100 by 2021 and every four years thereafter. (See Public Utilities Code section 454.53(d).)

14) The 2021 SB 100 report contains several key findings including that construction of clean electricity generation and storage facilities must be sustained at record-setting rates. Specifically, the 2021 report estimated the following build-out by 2030 is required to meet the ultimate 2045 targets: The addition of 16.9 GW of utility scale solar, 9.5 GW of battery storage and 8.2 GW of terrestrial wind.

15) The project's 205 MW is a contribution to the 2030 target identified in the SB 100 report of adding an additional 8,200 MW of terrestrial wind to the existing capacity, or .25% of the targeted amount.

16) As detailed in the environmental impact report, the project presents significant unmitigable impacts in the areas of biological resources, visual resources, cultural and tribal cultural resources, forestry resources, wildfire, and land use.

17) The project would provide local consumer benefits in the form of temporary employment during construction, about eight permanent jobs during operations, sales, and property tax revenue and, targeted community benefits.

18) Shasta County identified categories of costs such as wildfire recovery and fire insurance premiums that may offset some project benefits.

19) The project would provide renewable generation for statewide needs but is not designed to meet any specific reliability needs of the region and the project is likely to have a lower capacity factor during the summer and would therefore not be reliable generation to address summer net peak needs during heat events.

20) The Pit River Tribe opposes the project on the basis that the project is on traditional ancestral lands and will impact tribal cultural resources.

21) The project may not be consistent with AB 1757 and policies that encourage the use of nature-based climate solutions because it removes forested lands, the retention of which has been identified in state law as addressing the deleterious effects of climate change.

11.15 Conclusion

In considering the public safety, general welfare and environmental purpose of Shasta County Code sections 17.88.335, 17.08.010 and the Shasta County General Plan, Scenic Highways Element, the articulate opposition by the Pit River tribe, the unmitigable significant impacts to the environment in the areas of biological resources, tribal cultural resources, visual resources, forestry resources, wildfire and land use, the minimal reliability support from the project during summer net peak times, and the financial costs to Shasta County, the potential loss of some natural working lands to sequester carbon, balanced against the contribution of the 205 MW to the SB 100 goals, and the economic benefits to the community from the project, staff recommends the CEC find the project is not necessary for public convenience and necessity and should be denied.

This recommendation is based on substantial evidence and comes after an independent analysis of project information contained in the record, consultation with experts in the field, and independent research as described in each of the technical sections. The particular facts surrounding this project, acute impacts from intrusive turbines in a high fire zone forest setting with considerable biological resources and tribal significance, balanced against the diffuse benefits of contributing to a broader energy transition, favors a finding that the project's contribution is not required for public convenience and necessity.

If the CEC determines the project is necessary for public convenience and necessity, the CEC must determine if there are more prudent and feasible ways to achieve the public convenience and necessity.

11.16 More Prudent and Feasible Alternatives

Public Resources Code section 25525 requires application of the factors identified in the public convenience and necessity analysis to be applied to feasible alternatives. A feasible alternative would be more prudent only if it avoided, either completely or partially, the LORS noncompliance of the proposed facility and met the factors that made the proposed project necessary for public convenience and necessity.

"Prudent" means "Practically wise, judicious, careful, discreet, circumspect, sensible." (Black's Law Dictionary, 11th ed. 2019). "Feasible" is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." (California Code of Regulations, title 20, section 1201(h).)

The analysis in **Section 8, Alternatives**, provides an assessment of whether a battery storage energy system (BESS) alternative is a more prudent and feasible means of

achieving public convenience and necessity. The analysis reviewed the following: (1) whether the BESS alternative would avoid the significant effects of the proposed project; (2) whether the BESS alternative is consistent with applicable LORS; (3) the extent the BESS alternative meets the project objectives and stated Warren-Alquist Act policy objectives of grid reliability, SB 100 targets for renewable energy development and carbon-free energy, and consumer benefits; and (4) the feasibility elements of time to completion, economic, legal, social, and technological factors. After carefully reviewing the BESS alternative, staff concludes a BESS would be the environmentally superior alternative and thus, would be a more prudent and feasible alternative whether located on the current project site or elsewhere in Shasta County.

11.17 Proposed Findings of Fact for More Prudent and Feasible Alternatives

Based on the **Section 8, Alternatives**, analysis and entire record of proceeding, staff proposes the following findings of fact.

1) The 2021 SB 100 Joint Agency Report determined that a key factor in reaching the SB 100 renewable energy targets is to prioritize load flexibility within the transmission system through a diverse energy portfolio combined with energy storage.
2) Storage is a key requirement to fully decarbonize the grid as envisioned under SB 100.
3) The 2021 SB 100 Joint Agency Report estimates the need for an additional 9,500 MW of energy storage by 2030, with a total by 2045 of 52,000 MW of energy storage by 2045. The state will likely exceed the 9,500 MW of additional energy storage capacity from the baseline 2019 capacity in advance of 2030.
4) A BESS would contribute to the 2030 and 2045 energy storage capacity targets.
5) A BESS is technically and economically feasible while capable of being installed in in a shorter time frame than the proposed project.
6) A BESS would be consistent with local zoning laws and would not conflict with other laws.
7) A BESS would avoid the proposed project's significant and unavoidable environmental impacts identified in the areas of biological resources, forestry resources, land use, wildfire, tribal cultural resources, and visual resources.
8) A BESS would provide greater operational flexibility and could better support the transmission grid during net peak times when solar generation is offline.
9) A BESS would require fewer construction workers and likely no regular operational staff, thus reducing potential local economic benefits.

11.18 Conclusion

In considering the **Section 8, Alternatives**, analysis, staff recommends the CEC find the BESS alternative to be a more prudent and feasible means of achieving public convenience and necessity. Therefore, as related to this project, the Shasta County's prohibition against large wind energy systems at the project site should not be overridden, and the site's timber production zoning should not be rezoned to a non-forest use.

11.19 Significant Impacts That Cannot be Avoided or Mitigated, and Evaluation of Overriding Considerations Under CEQA

Separate from the override discussion regarding the project's nonconformance with local and state laws, the CEC must also decide whether to approve a project with significant unmitigable environmental impacts.

California Code of Regulations, title 14, section 15091 states that an agency cannot approve a project with one or more significant environmental effects unless the agency finds that,

> Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

California Code of Regulations, title 14, section 15093, titled "Statement of Overriding Considerations", authorizes an agency, based on substantial evidence to,

> balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable."

Taken together, California Code of Regulations, title 14, sections 15091 and 15093, require an agency to not approve a project with significant and unavoidable impacts unless, after careful consideration, the agency identifies other benefits of the project that outweigh the environmental damage.

Significant and unavoidable impacts have been identified in the areas of Biological Resources, Visual Resources, Tribal Cultural Resources, Wildfire, Forestry Resources, and Land Use. As described in the analysis for these technical sections, to the extent mitigation is proposed (referred to as Condition of Certification), the mitigation would not substantially lessen the impacts to render them less then significant. A summary of key impacts for each relevant technical area follows.

Biological Resources

Section 5.2, Biological Resources, contains a detailed description of the project impacts to biological resources from the construction and operation of the project.

Summary of Biological Significant Impacts. The biological resources analysis indicates that given the regional forested habitat and high number of species that occur in the region, the project would have significant and unmitigable impacts to multiple species primarily through two pathways, directly by collisions with turbines and due to impaired aerial firefighting, which may contribute to a larger fire damaging habitat and causing species mortality in the nearby Lassen and Shasta National Forests. In addition, large uncontrolled wildfires can adversely affect watershed function, damage, streams, and alter vegetative structure for decades or longer. For species that rely on older stands of conifers such as those that occur in adjacent forest lands, these fires can result in the displacement of these species.

For turbine collisions, based on Hatchet Ridge data, staff estimates that during the 35-year life of the project between 3,290-9,576 birds will be killed from turbine strikes. This includes 151-1855 raptors. Bat fatality rates for the Fountain Wind projects 48 turbines could range between 8,618.4 to 20,194 bats over 35 years assuming there is no variation in bat use between the sites. Operation of the project also has the potential to result in the loss of greater sandhill cranes which are a State Threatened and State fully protected species. Staff concurs with the Applicant that the project site does not appear to be located within a daily flight route and migrating cranes are known to fly at high altitudes (e.g., 3,000 to 5,000 feet above ground) that are generally above the height of proposed facilities. But in inclement weather, birds will fly at lower altitudes. However, staff notes that the project site and broader project area are located at the edge of a known migratory pathway for this species (Donnelly et al 2021.). In addition, several hundred sandhill cranes were observed in flight during avian surveys conducted by the Applicant (FWPA, TN 248309-5) but they could not be identified to species. It is likely that this species will collide with the turbines during the life of the project.

Monarch butterflies are in the area and are vulnerable to collisions with the turbines because they migrate at high altitudes and the project is located along a known broad migratory pathway for this species. Insect collisions with turbines are a well-known phenomenon to the extent that wind developers have been evaluating ways to minimize the drag that insect carcasses have on turbines. In addition, as noted by Voight (2021) tens of millions of insects can be lost at a single turbine site. It is likely that monarch butterflies would be subject to routine seasonal mortality for the life of the project.

The biological resources section also identified a sperate significant and unmitigable impact from operational activities based on impaired aerial firefighting at the site. Should wildfires be initiated during operations or spread to the site, the wildfire could more quickly spread to adjacent national forest lands if firefighting activities are hindered because of the large turbine heights and layout of the Project. The expanded fire could contribute to stand-replacing fires in adjacent lands including National Forest

Lands. Should this event occur, it could result in significant loss of habitat and could alter vegetation communities in the region.

Visual Resources

Section 5.15, Visual Resources provides an analysis of the proposed project effect to the existing physical environment specific to aesthetics and visual resources. Staff concludes the project would have a *significant effect on the environment* for "Aesthetics" in accordance with the CEQA Guidelines.

Staff concludes there would be several significant impacts that would be unmitigable pertaining to scenic vista, and from two key observation points (KOPs). See pages 5.15-13 through 5.15-15 and 5.21-21 through 5.21-23.

Staff finds the project would significantly affect nighttime darkness (the dark sky) in the existing physical environment by introducing a new source of artificial light as discussed on pages 5.15-27 to 5.15-32. The project also would introduce a new source of reflectance to the existing visual landscape as discussed on p. 5.15-14, and pp. 5.15-26 through 5.15-28.

Summary of Significant Effects to the Environment. The analysis includes a scenic vista as defined by the California Energy Commission and discusses the Shasta County General Plan Scenic Highway Element, Timberlands Element, and the Timberland Production Zone.

A site plan for the project shows seven wind turbines would span the "saddle" (a topographical narrow valley or gap) between Fuller Mountain and Carberry Mountain on the westside of Carberry Mountain, and four turbines crossing the saddle on the eastside of Carberry Mountain (see Visual Resources Figure 2 and Visual Resources Figure 3). The components of the project would physically change, obstruct, a scenic vista as defined. Staff also concludes the color, form, texture, scale, and motion by the wind turbines, other structures, and equipment for the project would have a *significant effect on the environment* to a scenic vista and would not be in conformance with the designations and identifications in the Shasta County Scenic Highways Element and Figure SH-1, objectives and policies in the Shasta County Timberlands Element, and use and requirements in the Timberland Production Zone.

Staff reviewed the applicant provided six photographs showing the existing physical landscape including the project site prior to alteration from a KOP (existing condition), and six visual simulations of the proposed project in the existing physical landscape from the same KOP (existing condition plus proposed project). Staff completed a Key Observation Point Evaluation Worksheet (worksheet) for each KOP (see Key Observation Point Evaluation Worksheets 1 through 6) and provided a synopsis of each worksheet in the analysis. The synopsis of KOP 4 and KOP 5 are presented below.

From KOP 4 along SR-299 west of Bunch Grass Lookout Road, given the existing physical landscape, the project prominence in the existing landscape rated severe. The visual

absorption capability of the landscape rated low. The magnitude of change in the landscape rated dominant, meaning the project would command or control the view in the landscape.

From KOP 5 along SR-299 at the approximate location for the proposed east access road entrance to the project site, given the existing physical landscape, the project prominence in the existing landscape rated strong, and would be severe when viewing the additional wind turbines beyond the ridge. The visual absorption capability of the landscape rated low. The magnitude of change in the landscape rated prominent, meaning the proposed project would stand out or appear striking in the view in the landscape.

From KOPs 4 and 5, the color, form, texture, scale, and motion by the wind turbines, other tall structures, and equipment on the project site cannot be camouflaged, disguised, screened, or exterior surface coated, colored or finished, nor can setbacks be employed that would mitigate the degrading of the existing visual character or quality of the public view of the site and its surroundings. For the purpose of the CEQA Guidelines, the project would have a *significant effect on the environment*.

Staff evaluated the potential new artificial light in the existing physical environment due to the installation of Federal Aviation Administration (FAA) approved air navigation and obstruction marking and lighting on 50-plus structures on the project site. Project components exceeding 200 feet tall would be required by the FAA to install lighting and be marked (e.g., a distinguishing color). FAA approved air navigation and obstruction lighting is designed to radiate light beyond the project site several miles to alert pilots of obstructions on the site. The emitted light traversing offsite on to surrounding properties would be light trespass, a component of light pollution (pp. 5.15-28 to 5.15-32, p. 5.15-32).

Staff concludes the new artificial light traversing offsite from an installed FAA air navigation and obstruction lighting system(s) in the existing physical environment would not be contained on the project site. The light trespass given the existing physical environment would have a *significant effect on the environment*. This is especially so given concerns expressed by the United States National Park Services regarding the new artificial light to the existing night sky darkness at the nearby national park and national recreation area where popular dark sky viewing activities (stargazing) are conducted.

Tribal Cultural Resources

As described in **Section 5.4, Cultural and Cultural Tribal Resources**, the analysis considers four broad classes of cultural resources: prehistoric, ethnographic, historic-period, and tribal cultural resources. Specifically, ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, value-

imbued landscapes, cemeteries, shrines, or neighborhoods and structures. Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users.

Summary of Tribal Cultural Significant Impacts. Through research and tribal consultation (see Section 5.4 of this document), the CEC staff identified a tribal cultural resource (as defined at Pub. Resources Code, § 21074(a)): a cultural landscape that the CEC staff refers to as the Montgomery-Hatchet Creek Tribal Cultural Landscape. As a tribal cultural resource, the Montgomery-Hatchet Creek Tribal Cultural Landscape is significant under CEQA, requiring the lead agency to consider impacts on the resource and propose mitigation measures to reduce the severity of impacts on the cultural landscape.

According to members of the Pit River Tribe, the tribal cultural landscape includes resources (biological, cultural, and topographical) that are significant to the tribe, such as trails, creeks, fish, medicinal plants, wildlife corridors, hunting grounds, ancestral cemeteries, power places, resting places, settlements, and mountain peaks. All these features of the cultural landscape coalesce in the drainages of Hatchet and Montgomery creeks where the applicant proposes to build the project. Modern tribal communities retain their lengthy and intimate connection to this place and claim continuity of use today. In addition, numerous discrete tribal cultural resources are in the proposed project site or within its viewshed. The project's intrusive turbines would significantly impact cultural characteristics of the project site and vicinity. The proposed project would introduce additional noise and lighting into a little-developed rural area, intruding on its natural characteristics and tranquility. The Pit River Tribe maintains that there is no mitigation for these impacts and although the CEC staff have identified mitigation measures for impacts on the Montgomery-Hatchet Creek Tribal Cultural Landscape. The CEC staff proposes conditions of certification **CUL-1** through **CUL-4** to reduce the severity of impacts on the cultural landscape but concludes that the conditions of certification do not reduce the severity of impacts to less-than-significant.

Wildfire

As detailed in **Section 5.7, Hazards, Hazardous Materials, and Wildfire**, the project site and surrounding areas are entirely located within an area designated as a very high fire hazard severity zone with a history of large wildfires in the region. (Section 5.7, pg. 5.7-5.) Examples of prior notable fires in the region include the 1992 Fountain Fire (60,290 acres), the 1998 Burney Fire (3,264 acres), the 2012 Ponderosa Fire (27,676 acres), and the 2014 Eiler Fire (32,416 acres) (CAL FIRE and Shasta County Fire 2023). Humans have become the dominant source of ignitions in California (Keeley & Syphard 2018). The project would introduce increased temporary human activity and potential ignition sources in the project area due to construction activities due to the presence of construction equipment and crews, and blasting activities (if deemed necessary). Additionally, the project would introduce increased permanent human influences including the presence of the 610 foot tall wind turbine towers,

associated electrical components including overhead electrical collector lines, and the presence of operations and maintenance personnel.

Thus, any project features that contribute to the risk of initiating a fire or impact the ability to fight a wildfire moving through the site must be closely scrutinized. In this case substantial evidence demonstrates that the project will impact emergency response activities by impairing aerial firefighting through reduction of the ability of fixed wing aircraft to fly through the project site close enough to the ground for retardant (or water) drops to effectively attack a fire.

Summary of Wildfire Significant Impacts. The analysis set forth in Section 5.7, pages 5.7-31 to 5.7-33, details the features of the project, in addition to being in a very high fire zone, which would impact aerial firefighting. This includes the 610-foot height of the turbines, over 50 feet taller than the Washington Monument (See https://www.nps.gov/wamo/faqs.htm#:~:text=How%20tall%20is%20the%20Monument,feet%20wide%20at%20the%20base.) The layout of the 48 turbines scattered throughout the over 2800-acre project site represent aerial hazards and reduce the zones within the project site fixed wing aircraft can fly to deploy fire retardant.

In the event of a large wildfire in the project area, CAL FIRE and the Shasta County Fire Department would deploy ground firefighting crews and the incident commander would work with the CAL FIRE Air Tactical Group (ATG) to deploy aerial firefighting assets (fixed winged aircraft and helicopters). The ATG supervisor would be in command of aerial assets during a wildfire. This supervisor would determine whether aerial assets could be used safely in the area and this assessment would depend on the terrain and the fire and weather conditions involved (CEC 2024i TN 254899).

Based on information from experts in the field, staff states in **Section 5.7, Hazards, Hazardous Materials, and Wildfire** that,

> CAL FIRE ground firefighting assets could be deployed to the area in the event of a wildfire, their effectiveness would be hampered without the appropriate aerial coverage, especially given the mountainous terrain and other characteristics of the project area previously discussed. The decreased effectiveness could prolong firefighting activities or potentially allow a wildfire to spread across the large site. Since CAL FIRE could potentially not provide the full suite of firefighting assets in the event of a wildfire at the project site due to the reasons discussed above, staff has determined that the project would create a potentially significant and unmitigable impact.

While there are multiple factors that play a role in the ATG supervisor's determination of the extent aerial firefighting can be deployed, evidence suggests the layout and height of the turbines create a significant obstruction that cannot be adequately mitigated despite requiring notification to pilots and shutting down turbines when a fire approaches. The applicant would be required to provide location data for the wind turbines to local and national hazard maps, but as indicated by Chief O'Hara and CAL

FIRE this does not remove the impediment to aerial firefighting, it just identifies the wind tower locations (CEC 2024i TN 254899, CALFIRE 2024d TN259802). CEC staff proposes COC HAZ-6 to ensure that the turbines are fully shut down and positive confirmation of the shutdown is provided to CAL FIRE in the event of a wildfire for the safety of aerial assets operating in the area, however this does not mitigate the impairment to aerial firefighting emergency response introduced by the presence of the wind turbines.

Land Use and Agriculture

As detailed in **Section 5.8, Land Use**, the Fountain Wind project would be located in an unincorporated and rural area of Shasta County. The proposed project area includes 37 parcels of privately-owned land, which totals approximately 16,108 acres (FWPA, TN 251663). The project area is designated by the Shasta County General Plan as Timber (T) and has a zoning designation of Timber Production (TP) (Shasta County 2023a). Existing land uses within the project area consist exclusively of timber harvesting.

Summary of Land Use Impacts. As discussed in the LORS section of this override analysis, the project is inconsistent with Shasta County's zoning requirements prohibiting large wind facilities within an unincorporated area of the County. Due to this conflict with the existing zoning for the proposed site, construction and operation of the project would create a significant and unavoidable impact under CEQA.

Forestry Resources

Under California Public Resource Code section 4528(d), the productive potential of timberland is classified into one of five classes by California Board of Forestry and Fire Protection regulation, Site Class I denotes sites of high productivity, Site Class II and Site Class III denote sites of intermediate productivity potential, and Site Class IV and Site Class V denote sites of lowest productivity potential. The project site is primarily Site Class I, with some areas of Site Class II. Total area of project-related disturbance is anticipated to be 1,058 acres within the 2,855-acre project site, of which 510 acres would be permanently disturbed (i.e., conversion from timberlands to other uses), and 548 acres would be temporarily disturbed.

Summary of Forestry Significant Impacts. The project has two significant and unmitigable impacts. First, the project is inconsistent with the site's Timber Production zoning (TP district or TPZ) under Shasta County Code section 17.08.010, which sets forth conditions and restrictions that limit TP districts to timber harvesting and related activities. Second, the project would result in the permanent conversion of 510 acres of Site Class I (high productivity) and II (intermediate productivity) forest land to non-forest use. Conversion of 510 acres of high to intermediate productivity timberland zoned for timber production represents a significant impact to forest resources.

11.20 Project Benefits

As noted in the discussion on the inconsistent LORS analysis, the project contributes to statewide renewable energy and carbon free energy goals under SB 100 and potentially displaces GHG emissions.

Potential local benefits from the project include total construction-related economic output for Shasta County from direct, indirect, and induced effects is estimated to be about $60 million. Total operation-related economic output for Shasta County from direct, indirect, and induced effects is estimated to be about $6 million each year during its 35-year lifetime.

The project provides temporary employment to about 70 workers per month for two years and permanent employment to eight workers during operations. According to the project's economic impact assessment, the project is estimated to generate approximately $60 million in property tax revenues over the life of the project (2021-dollar terms), which is an average of about $1.7 million annually. Under current tax allocation factors from the Shasta County Auditor-Controller Office, about $7.5 million of the project lifetime total would accrue to the county, $4 million to cities, $3.6 million to special districts, $8 million to Redevelopment Property Tax, $9 million to the Educational Revenue Augmentation Fund, and $28 million to schools (see TN 250915). The project would also provide additional benefits through community benefits agreements.

11.21 Proposed Findings of Fact Regarding CEQA Overriding Considerations

1) Based on substantial evidence, significant unmitigable impacts result from the project in the areas of Biological Resources, Visual Resources, Tribal Cultural Resources, Wildfire, Forestry Resources, and Land Use.
2) California Code of Regulations, title 14, sections 15091 and 15093 require an agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project.
3) The project may result in the mortality of birds, bats and Monarch butterflies through turbine collisions and may enhance wildfire spread impacting offsite habitat.
4) The proposed wind turbines would be visually intrusive and cannot be camouflaged or screened given their size, color, and motion in comparison to the existing landscape.
5) Important tribal cultural landscapes coalesce in the drainages of Hatchet and Montgomery creeks where the applicant proposes to build the project. Modern tribal members retain their lengthy and intimate connection to this place for

cultural identity. In addition, at least twenty discrete tribal cultural resources are in the proposed project site or within its viewshed.

6) The layout of the 48 turbines each up to 610 feet tall, scattered throughout the over 2800-acre project site represent aerial hazards and reduce the zones within the project site aircraft can fly to deploy fire retardant.

7) Under CEQA a project that is inconsistent with established zoning laws may be considered as having a significant impact to land use and planning.

8) The project is zoned as a timber harvest district limiting the project site for timber harvesting and related activities. The project would result in the permanent conversion of 518 acres of forest land to non-forest use. Forests within the project site have high to intermediate productivity potential based on site class (primarily Site Class I, with some Site Class II).

9) The project contributes to statewide renewable energy and carbon free energy goals under SB 100 and potentially displaces GHG emissions.

10) The project provides economic benefits to the county through direct and indirect construction output, temporary employment to about 70 workers per month for two years and permanent employment to eight workers during operations. According to the project's economic impact assessment, the project is estimated to generate approximately $60 million in property tax revenues over the life of the project (2021-dollar terms), which is an average of about $1.7 million annually.

11.22 Recommended Determination Regarding CEQA Override Considerations

Based on substantial evidence and detailed analysis identifying multiple significant and unavoidable impacts, which includes potential injury and death to special status species, disruptive changes to the visual characteristics of the region, damage to cultural sites and interference with tribal practices, and impacts to aerial firefighting, and only moderate local and statewide benefits in the areas of renewable energy, greenhouse gas emission reductions, and local jobs, staff recommends the CEC find that on balance, the project's significant impacts are not outweighed by the project's benefits and the project should be denied.

11.23 References

CALFIRE 2024d – CAL FIRE (TN 259802). Letter from CAL FIRE Department of Forestry and Fire Protection, dated October 30, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

CAL FIRE and Shasta County 2023 - California Department of Forestry and Fire Protection (CAL FIRE) and County of Shasta (Shasta County). 2023 Shasta-Trinity Umit Strategic Fire Plan. Accessed January and February 2024. Available

Accessed online at: https://cdnverify.osfm.fire.ca.gov/media/nimdqw1b/2023-shasta-trinity-unit-fire-plan.pdf

CEC 2024i – California Energy Commission (TN 254899). ROC - Impacts of Project Related to Wildfire, Firefighting, and Aerial Firefighting Capability, dated March 7, 2024. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Keeley & Syphard 2018 - Keeley, J. E., & Syphard, A. D. Historical patterns of wildfire ignition sources in California ecosystems. International Journal of Wildland Fire, 27(12), 781–799.

Voigt 2021 – Voigt, C.C. Insect fatalities at wind turbines as biodiversity sinks. Conservation Science and Practice 2021;3:e366.

Donnelly et al. 2021 – Donnelly, J.P., S.L. King, J. Knetter, J.H. Gammonley, V.J. Dreitz, B.A. Grisham, M.C. Nowak, and D.P. Collins. Migration efficiency sustains connectivity across agroecological networks supporting sandhill crane migration. Ecosphere 12(6): 1-22

FWPA – Fountain Wind Project Application (TN 248309-5). 2018 Avian Use Study, dated November 5, 2018. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Section 12

Authors and Reviewers

12 Authors and Reviewers

Lead Agency—California Energy Commission

Section Authors

Alvin Greenberg, Ph.D., Risk Sciences Associates (Worker Safety/Fire Protection)

Brewster Birdsall, Aspen Environmental Group (Air Quality, Greenhouse Gas Emissions, Public Health)

Chris Huntley and Leane Dunn, Aspen Environmental Group (Biological Resources)

Lauren DeOliveira and Roger Hatheway, Aspen Environmental Group (Cultural and Tribal Cultural Resources)

Eileen Allen, Aspen Environmental Group (Socioeconomics, Forestry Resources)

Negar Vahidi, Aspen Environmental Group (Cumulative Scenario, Land Use/Agriculture, Socioeconomics, Forestry Resources, Environmental Justice, Alternatives)

Irene Kaufman, Aspen Environmental Group (Cumulative, Socioeconomics, Environmental Justice)

Tatiana Inouye, Aspen Environmental Group (Land Use/Agriculture, Forestry Resources, Alternatives)

Nader Khalil, Aspen Environmental Group (Land Use/Agriculture)

Tim Keesey, Aspen Environmental Group (Forestry Resources)

Jon Davidson, Aspen Environmental Group (Alternatives)

Kenneth Salyphone (Energy and Energy Resources, Facility Reliability)

Ardalan Sofi (Noise and Vibration, Facility Design)

Kevin Delano (Geology, Paleontology, and Minerals)

Aurie Patterson, Aspen Environmental Group (Hazards/Hazardous Materials/Wildfire)

Dr. Alexandra Syphard, Conservation Biology Group (Hazards/Hazardous Materials/Wildfire)

James Ackerman (Water Resources and Solid Waste Management)

Ashley Gutierrez (Compliance Conditions and Compliance Monitoring Plan)

Dave Robinson, Fehr and Peers (Transportation)

Laiping Ng (Transmission System Engineering)

Mark Hamblin, MPA (Visual Resources)

Sudath Edirisuriya (Transmission Line Safety and Nuisance)

Supervision and Management

Wenjun Qian, Air Quality Unit Supervisor

Eric Knight, (Acting) Biological Resources Unit Supervisor

Ann Crisp, Biological Resources Unit Supervisor

Steve Kerr, Land Use and Public Services Unit Supervisor

Gabriel Roark, Cultural Resources Unit Supervisor/Assistant Tribal Liaison
Shahab Koshmashrab, Facility Design Unit Supervisor
Brett Fooks, Hazards Unit Supervisor
Abdel-Karim Abulaban, Geosciences Unit Supervisor
Joseph Hughes, Engineering Branch Manager
Eric Knight, Siting and Environmental Branch Manager
Dian Vorters, Deputy Director —Siting, Transmission, and Environmental Protection Division
Elizabeth Huber, Director—Siting, Transmission, and Environmental Protection Division

Project Assistant

Marichka Haws

Project Management/Legal

Leonidas Payne, Project Manager
Lisa Worrall, Project Manager
Jared Babula, Staff Counsel
Kari Anderson, Staff Counsel
Mariah Ponce, Staff Counsel

Appendix 1

Cumulative Scenario

Appendix 1 Cumulative Scenario

Preparation of the cumulative impact analysis is required under CEQA. In the CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (Cal. Code Regs., tit. 14, § 15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects, is "cumulatively considerable," and therefore potentially significant (Cal. Code Regs., tit. 14, § 15130(a)(2)). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (Cal. Code Regs., tit. 14, § 15164(b)(1)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

The discussion of cumulative impacts must reflect the severity of the impacts, as well as the likelihood of their occurrence, yet the discussion need not be as detailed as the discussion of environmental impacts attributable to the project alone. When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. (Cal. Code Regs., tit. 14, § 15130(a)(2)).

The cumulative impact discussion is intended to be guided by the standards of practicality and reasonableness (Cal. Code Regs., tit. 14, § 15130(b)). CEQA Guidelines sections applicable to a cumulative impact analysis state the following:

- CEQA Section 15355: *"Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.*

  (a) The individual effects may be changes resulting from a single project or a number of separate projects.

  (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.
- CEQA Guidelines Section 15130 (a)(1): As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

- CEQA Guidelines Section 15064(h)(4): The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

1.1 Cumulative Project Scenario

Under CEQA, there are two commonly used methodologies for establishing the cumulative impact scenario—the "list approach" and the "projections approach." The list approach uses a "list of past, present, and probable future projects producing related or cumulative impacts" (14 CCR §15130(b)(1)(A)). The projections approach uses a "summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect" (14 CCR §15130(b)(1)(B)).

This Staff Assessment utilizes both approaches to provide an understanding and context for analyzing the potential cumulative effects related to the proposed project. Planning documents are used to provide an overall context for the cumulative scenario over a 10- to 20-year planning horizon, while the project list supplements the cumulative scenario with information on specific projects that are proposed or under construction in the surrounding communities, with the furthest projects located in the City of Redding (approximately 50 miles from the proposed project site). As the direct and indirect effects of a project are generally evaluated within a smaller radius (e.g., six miles for dispersion modeling, 10 miles for biological resource special-status species, etc.), a radius of up to 50 miles encompasses a sufficient geographic area for identifying a comprehensive list of cumulative projects to be analyzed in the cumulative scenario.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. For each resource area, this EIR evaluates the cumulative impacts as follows:

- Defines the geographic scope of cumulative impact analysis for each discipline, based on the likely geographic extent in which proposed project impacts could combine with those of other projects.
- Evaluates the effects of the proposed project in combination with past and present (existing) projects within the geographic scope defined for each discipline.
- Evaluates the effects of the proposed project with foreseeable future projects that occur within the geographic scope defined for each discipline.

In order to reflect the greatest potential for combined impacts, the cumulative analysis assumes that all projects defined in the cumulative scenario are constructed or operating during the construction and operation period of the proposed project.

1.2 Projects and Planning Documents Considered in the Cumulative Impact Analysis

1.2.1 Applicable Cumulative Projects

Applicable cumulative projects consist of projects that are reasonably foreseeable and would be constructed or operated during the life of the proposed project. Cumulative projects include land development or public works projects that are planned or approved and, given their physical proximity to the project area or an overlap in the transportation routes used during construction, could potentially contribute to the same environmental effects as the proposed project.

The cumulative projects were compiled from the following sources:

- Shasta County Department of Public Works — Shasta County's active and recently completed long-range planning projects.
- USFS Lassen National Forest — Current and recent projects to occur in Lassen National Forest.
- Caltrans — Transportation projects that are in the planning or project development stages, or are under construction within Caltrans District 2.
- CAL FIRE — Proposed activities under CAL FIRE's Forest Health Program.
- Shasta Regional Transportation Agency (SRTA) — Transportation improvement projects identified in SRTA's 2018 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) and in the 2022 Draft Supplemental Environmental Impact Report for the RTP/SCS.

1.2.2 Applicable Planning Documents and Growth Projections

As described in CEQA Guidelines Section 15130(b), planning documents that are relevant to developing a cumulative scenario include a general plan, regional transportation plan, plans for the reduction of greenhouse gas emissions, or an adopted or certified environmental document for such a plan. The planning documents presented below provide information on future development projects, plans, population and employment projections, and other factors that could combine with the effects of the proposed project. Because implementation of the proposed project is anticipated to occur over a 40-year period[1] and is affected by many factors such as funding, technical recommendations, public involvement, and seasonal conditions, long-range planning documents and projections have been used to forecast comprehensive future conditions that may occur simultaneously with the Project.

1 The lifespan of the project is anticipated to be 35 years, with project construction occurring over a 28 month-period and decommissioning requiring an additional 24 months (FWPA TN 251663).

Shasta County

Shasta County General Plan

The Shasta County General Plan was updated in September 2004. The Shasta County General Plan is intended to guide growth and change within the County over a period of 20 years. This document is a long-range plan that guides decision-making, establishes rules and standards for development and County improvements, and informs residents, developers, and decision-makers on the County's vision for the future (Shasta County Planning Division 2004). The themes discussed in the General Plan reflect the values and goals of Shasta County and its residents and provide direction on future development that could have a cumulative effect when considered with the proposed project.

The Shasta County General Plan considers 10 local factors that influenced change in Shasta County over the past 20 years, including the ability to maintain quality of life in Shasta County, which "...is a key concept and basis of the Plan." (Shasta County Planning Division 2004). "Quality of life" concepts include the makeup of the social and natural environment. While the General Plan assumes economic growth and development, it states,

> *Economic development programs which strengthen and promote the enrichment of both town and rural community centers by expanding job diversity and pay scales consistent with housing affordability, in addition to geographic location consistent with community design and identity, will contribute to quality of life values. Conversely, economic development which contributes to increased traffic and air quality impacts, is not located within planned community centers, or does not promote efficient use of land and public services may result in a development pattern which could lessen the quality of life*.

Specific quality-of-life factors that make Shasta County a desirable place to live for its residents include clean air quality, good schools, civic and cultural opportunities, recreation and outdoor resources, lower crime rates, less traffic congestion, water quality, and low housing costs when compared to other areas.

While the 2004 General Plan does not discuss wind energy in detail, it discusses renewable energy as follows; *"...[d]evelopment of the renewable and nonrenewable energy resources of Shasta County could have a noteworthy and beneficial impact on the County's economic growth and land use pattern if done in a manner sensitive to certain environmental constraints*." Since the 2004 adoption of the plan, Shasta County has adopted two ordinances addressing large wind energy systems, which are described below.

Shasta County General Plan, Housing Element

The 2020-2028 Housing Element of the Shasta County General Plan was updated in 2020 and is the most recent Element of the General Plan (Shasta County Planning

Division 2020). The following content from the County's Housing Element is relevant to the cumulative scenario:

- An assessment of housing needs and an inventory of resources and constraints relevant to meeting those needs;
- A statement of the community's goals, quantified objectives, and policies relevant to the maintenance, improvement, and development of housing; and
- A program that sets forth an 8-year schedule of actions that the local government is undertaking or intends to undertake, with specified timetables, to implement the policies to achieve the goals and objectives of its Housing Element.

Population Projections. Growth projections are used by the County to determine future infrastructure needs (e.g., roads, public facilities, utilities), the need for changes in land use designations and urban boundaries to accommodate growth, and future impacts that may arise from an increased demand in resources and expanded development. According to the County's Housing Element, during the previous decade (from 2000-2019), population across the County increased 0.9 percent, whereas the unincorporated area of Shasta County showed a 2.9 percent decrease (Shasta County Planning Division 2020).

The California Department of Finance (DOF) has published 20-year population growth projections for Shasta County, which are consistent with the data used by the California Department of Transportation to develop its Shasta County Economic Forecast. These datasets are the most up-to-date growth projections currently available for Shasta County (See **Table 1-1A** below). The current population for the unincorporated county areas is 65,727 people, which is approximately 36 percent of the entire County's total population (DOF 2023a). The County's population is predicted to increase by 0.4 percent through 2027 (DOT 2022).

TABLE 1-1A POPULATION AND FORECASTED GROWTH OF SHASTA COUNTY

Geographic Area	Population		Percentage Change
	2023	2040	
Unincorporated County[1]	65,727		
Shasta County Total[2] (DOF)	**179,455**	**180,245**	**0.4 percent**

Sources: 1 DOF, 2023a; 2 DOF, 2023b

Lassen National Forest Land and Resource Management Plan (FLRMP)

Lassen National Forest Land and Resource Management Plan (FLRMP) was adopted in 1992. Its purpose is to:

- Set the Forest Goals and Objectives for the next 10 to 15 years;
- Set the Standards and Guidelines, and the approximate timing and location of practices necessary to achieve these goals and objectives; and

Set the requirements for monitoring and evaluation needed to insure that management direction is implemented and its objectives are met, and to trigger changes in that direction, if needed.

Federal law requires the protection of Forest resources by well planned and executed fire protection and fire use programs (USFS 1992).

There are two resource-related issues in the FLRMP that are directly relevant to this cumulative scenario: Energy and Fire. The FLRMP acknowledges that several areas of the Lassen National Forest are classified as excellent for wind power because they offer a mean power density greater than 28 watts per square foot at a wind speed of 14 miles per hour; however, “access, facility development, and electrical transmission costs appear prohibitive”(USFS 1992). The FLRMP did not identify a need, or anticipated future need, for wind power. Fire protection programs under the FLRMP include prevention, detection, presuppression, suppression, and fuels management. The California Department of Forestry and Fire Protection works with the Forest Service to manage fires in the Forest (USFS 1992).

Table 1-2 provides a list of applicable cumulative projects and **Figure 1-1** shows the locations of these projects relative to the proposed project.

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
1	Lower Gas Point Road at Northfork Cottonwood Creek *(Shasta County Public Works)*	Cottonwood	Status unknown	Replacement of existing bridge with longer and wider structure approximately 40-ft downstream of the current alignment. New roadway approaches would be constructed. Existing bridge will remain open during construction. Upon completion of new bridge alignment, eastern span of existing bridge would be removed and western span and center pier would be retained as a public-accessible overlook. Bypassed roadway would be removed and area restored to match surrounding conditions.	57 miles southeast	Shasta County Public Works 2023a; CEQANet 2023; Construction Journal 2023
2	West Central Landfill Site Improvements *(Shasta County Public Works)*	Community of Igo	Not available	Expanding the Transfer Area with stormwater conveyance pipeline improvements, drop inlets, earth grading, earthwork, concrete site work, hot mix asphalt paving, pavement stripping, extending underground utilities and furnishing a Metal Building System.	54 miles southwest	Shasta County Public Works 2023a; Construction Journal 2023
3	Zogg Fire Area Road Improvements *(Shasta County Public Works)*	Redding	Completed July 2023	Maintenance, Paving/Reconstruction, Site Development	53 miles southwest	Shasta County Public Works 2023a
4	Old Juvenile Hall Demolition *(Shasta County Public Works)*	Redding	Not available	Construction/Demolition	41 miles southwest	Shasta County Public Works 2023a
5	Shasta County Riverside Avenue Fire Station 47 *(Shasta County Public Works)*	19850 Riverside Ave, Anderson	November 2022	The station is situated between I-5 and Highway 273, allowing quick access, in either direction of both corridors, and providing faster response times to the approximately 30,000 residents and businesses.	42 miles southwest	Shasta County Public Works 2023a

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
6	C.A.T.T.L.E. Project (Cottonwood Transport Trunk Line Express) *(Shasta County Public Works)*	Cottonwood	Estimated completion 2027	Construction of walking and biking facilities and pedestrian lighting. Project involves construction of new shared-use pathways, sharrows (pavement markings for shared vehicle/bicycle road sections), crosswalks, ADA-compliant ramps, and pedestrian lighting on Fourth Street, First Street, Second Street, Main Street, Brush Street, and Locust Street in Cottonwood, totaling approximately 2.8 miles of improvements.	46 miles southwest	Shasta County Public Works 2023a
7	Parkville Road at Ash Creek Bridge *(Shasta County Public Works)*	Ash Creek (3.4 miles south of Dersch Road)	Status unknown	Bridge repair	38 miles southwest	Shasta County Public Works 2023a; Construction Journal 2023; Redding 2023
8	Ash Creek Road at Sacramento River Overflow *(Shasta County Public Works)*	Sacramento River Overflow; 0.9 miles east of Balls Ferry Road	Unknown	Bridge repair	40 miles southwest	Shasta County Public Works 2023a; Construction Journal 2023; Redding 2023
9	Bear Mountain Road at Deep Hole Creek Bridge *(Shasta County Public Works)*	Deep Hole Creek (100 FT S/O Bernard Way)	Not available	Bridge repair	30 miles southwest	Shasta County Public Works 2023a; Redding 2023
10	Lakeshore Drive at Doney Creek Bridge Repair *(Shasta County Public Works)*	Doney Creek (0.8 miles southwest ANTLR UC on I-5)	Status unknown	Bridge repair	36 miles west	Shasta County Public Works 2023a

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
11	Soda Creek Road at Soda Creek Bridge *(Shasta County Public Works)*	Soda Creek (3.0 miles east of I-5)	Not available	Construction/Improvements	38 miles northwest	Shasta County Public Works 2023a; Redding 2023
12	Fern Road East at Glendenning Creek Bridge *(Shasta County Public Works)*	Whitmore; Glendenning Creek (0.3 miles north of Whitmore Road)	Status unknown	Bridge repair	13 miles south	Shasta County Public Works 2023a; Construction Journal 2023; Redding 2023
13	Round Mountain 500 kV Area Dynamic Reactive Support Project (Fern Road Substation)	East of Fern Road and east of PG&E transmission ROW, approximately 1.6 miles northwest of Whitmore and 9.3 miles north of State Highway 44 in southern Shasta County	Under Review	Project would construct a Static Synchronous Compensator (STATCOM) Substation (i.e., Fern Road Substation). The STATCOM units would be independently connected to PG&E's regional electric transmission system via the Round Mountain – Table Mountain #1 and #2 500 kV transmission lines that are located adjacent to the project.	15 miles southwest	CPUC 2023
14*	Diddy Roost Culverts	Route 299; 0.5 mile west of Seamans Gulch Road to 0.1 mile west of Fenders Ferry Road	Estimated 70-day construction period, scheduled to start in summer of 2026	Replacement of 26 culvert systems and upgrade 20 drainage inlets along SR 299 in Shasta County.	5 miles west	Caltrans 2023
15	Ingot Curve Improvement	Route 299; from 2 miles east of Seamans Gulch	August 2022 through January 2025	Project would widen shoulders, realign the highway for alignment consistency, increase sight distances, and create a clear recovery area on SR 299 near Ingot.	13 miles southwest	Caltrans 2023

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
		Road to just west of Du Bois Road				
16	Fenders Ferry Culverts	Route 299; near Montgomery Creek in Shasta County, from Fenders Ferry Road to Windy Point Road	There are an estimated 20 working days for this project, 15 of which will require traffic control. Status unknown	Culvert restoration at six locations on State Route 299 within the project area.	5 miles west	Caltrans 2023
17	Potato Cut	Route 299; post miles 57.5/59.0	2026	Curve improvement	3 miles west	Caltrans 2023
18	Nelson Creek Road at Nelson Creek Bridge *(Shasta County Public Works)*	Big Bend; 0.4 miles east of Big Bend Road	Not available	Bridge replacement	14 miles north	Shasta County Public Works 2023a; Redding 2023
19	Hatchett Ridge Wind	Burney	Operational since 2010	The 101.2 MW facility includes 44 wind turbines.	1 mile east	Pattern Energy 2023
20	Burney CAPM Project on State Route 299	Near Burney, from 2.6 miles east of Carberry Flat Road to 0.3 miles east of Burney Mountain Power Road	Status unknown	Project includes an asphalt overlay, upgrading curb ramps and guardrail to current standards, and drainage work	6 miles northeast	Caltrans 2023
21*	Burney Falls Pavement	Route 89; post miles 22.0/30.6	Status unknown	Pavement rehabilitation	15 miles northeast	Caltrans 2023

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
22	Spring Creek at Fall River Bridge *(Shasta County Public Works)*	7.5 miles northwest of Town of Fall River Mills at the confluence of the Fall River and Spring Creek	Status unknown	Bridge replacement	30 miles northeast	Shasta County Public Works 2023a; Construction Journal 2023
23	Fall River Mills Airport - Taxiway Resurfacing *(Shasta County Public Works)*	Fall River Valley	Not available	Taxiway resurfacing	28 miles northeast	Shasta County Public Works 2023a
24	Cassel-Fall River Road at Pit River Bridge Replacement *(Shasta County Public Works)*	Fall River Mills, approximately 0.3 miles southeast of State Route 299 on Cassel Fall River Road	Not available	Replace existing six-span, 300-ft. long by 23.7-ft. wide Cassel-Fall River Road Bridge over the Pit River with a new three-span, 300-ft. long by 32.7-ft. wide precast concrete girder bridge on a parallel alignment downstream of the existing bridge. The existing bridge will remain open until the new bridge is open to traffic at which time the old bridge will be demolished and removed.	27 miles northeast	Shasta County Public Works 2023b
25	Anderson River BESS	Anderson	Proposed Commercial Operation Date: January 2026	A 200 MW battery storage project. Pacific Gas and Electric Company (PG&E) is identified as the participating transmission owner. The proposed point of interconnect is the Cottonwood 230 kV Substation.	30 miles southwest	CAISO 2024
26	Crossroads 2	Montgomery Creek	Proposed Commercial Operation Date: January 2027	A 313 MW battery storage project with a projected size of 85 acres. PG&E is identified as the participating transmission owner. The proposed point of interconnect is the Round Mountain 230 kV Substation.	3 miles west	CAISO 2024

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
27	Meadow Ridge 2	Northern California Electrical Grid	Proposed Commercial Operation Date: February 2026	Project includes a 180 MW solar photovoltaic (PV) facility and a 47 MW battery storage system. PG&E is identified as the participating transmission owner. There are two proposed points of interconnect: the PIT#1 - Cottonwood 230 kV line and the Round Mountain - Cottonwood #3 line.	Location unknown	CAISO 2024
NA	Cascade Office Building Storm Drain Repair *(Shasta County Public Works)*	Breslauer Way in Redding	October 2022	Replacement of approximately 1,060 ft. of existing storm drain, varying in size from 12-inch diameter to 36-inch diameter pipe; includes installation of four new catch basins.	Location unknown	Shasta County Public Works 2023a; Construction Journal 2023
NA	Intermountain Area Overlay Project *(Shasta County Public Works)*	Redding	Status unknown	Maintenance, Paving/Reconstruction, Site Development	Location unknown	Shasta County Public Works 2023a; Construction Journal 2023
NA	Backbone Project *(Lassen National Forest)*	West of Thousand Lakes Wilderness, continuing south to the LaTour State Forest. Township 32N, Range 3E, Sections 4-5,8-9; T33N, R3E, Sec 3-4,9-11,16-17,20,29-33; T34N, R3E, Sec 33 and 34	On Hold	Project would improve forest health and diversity, improve fire resilience, improve wildlife habitat resilience, and increase carbon sequestration	Location unknown	USFS 2023
NA	Green Badger Forest Health Restoration Project *(Lassen National Forest)*	Northern boundary of Lassen Volcanic National Park, extending 0.25 miles beyond State	On Hold	Proposed forest health and resilience treatments would reduce wildfire risk, promote forest health and diversity, protect resource values, and restore ecological processes	Location unknown	USFS 2023

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
		Highway 44 in Townships 31-33N, Range 4-6E, Mount Diablo Base and Meridian				
NA	Hat Creek-Westwood Hazard Reduction Project *(Lassen National Forest)*	Activities in the communities of Hat Creek and Old Station, south to Lassen Volcanic National Park: multiple sections in T31N, R3E,R4E,R5E; T32N, R4E,R5E; T33N, R5E; T34N, R4E,R5E	On Hold	The project involves timber stand improvements designed to reduce hazards associated with PG&E's Hat Creek to Westwood transmission line.	Location unknown	USFS 2023
NA	Region 5 Post-Disturbance Hazardous Tree Management Project *(Lassen National Forest)*	Lassen National Forest	Over next 3 years	Hazard tree felling and removal is proposed to reduce public safety hazards along portions of certain roads, trails and facilities within nine national forests.	Location unknown	USFS 2023
NA	Dixie Fire Community Protection and Swain Mountain Experimental Forest Vegetation Management Project *(Lassen National Forest)*	Proposed work areas include the communities of Old Station, Silver Lake, Warner Valley, Chester, Pratville, Baccala, Humbug Valley & Coon Hollow; Bogard Work Center &	TBD – Developing Proposal	Treatment of 48,462 acres of community protection zones.	Location unknown	USFS 2023

TABLE 1-2 CUMULATIVE PROJECTS LIST

Map ID #	Project Name	Location	Status/ Timeframe	Description	Distance from Project	Source[1]
		Swain Mountain Experimental Forest.				
NA	Burney-Hat Creek Bioenergy	Burney	Status unknown	Community-scale 3 MW biomass gasification to energy system utilizing forest sourced feedstock. To be installed on a 9-acre site. Current site includes offices, construction equipment storage, an asphalt plant, a concrete plant, a rock quarry, wild rice cultivation, and a brewery.	Location unknown	Energize Innovation 2023
NA	Burney-Hat Creek Forest Health Project, Phases 1 and 2	Shasta County south and west of Burney; and throughout Lassen National Forest	2021-2025	A components of the CAL FIRE Forest Health Program, intended to increase fuels reduction, fire reintroduction, treatment of degraded areas and conservation of threatened forests.	Location unknown	CAL FIRE 2023

[1]See References Section for full reference.

* Map ID number appears twice on **Figure 1-1**, which represents the two ends of this linear cumulative project.

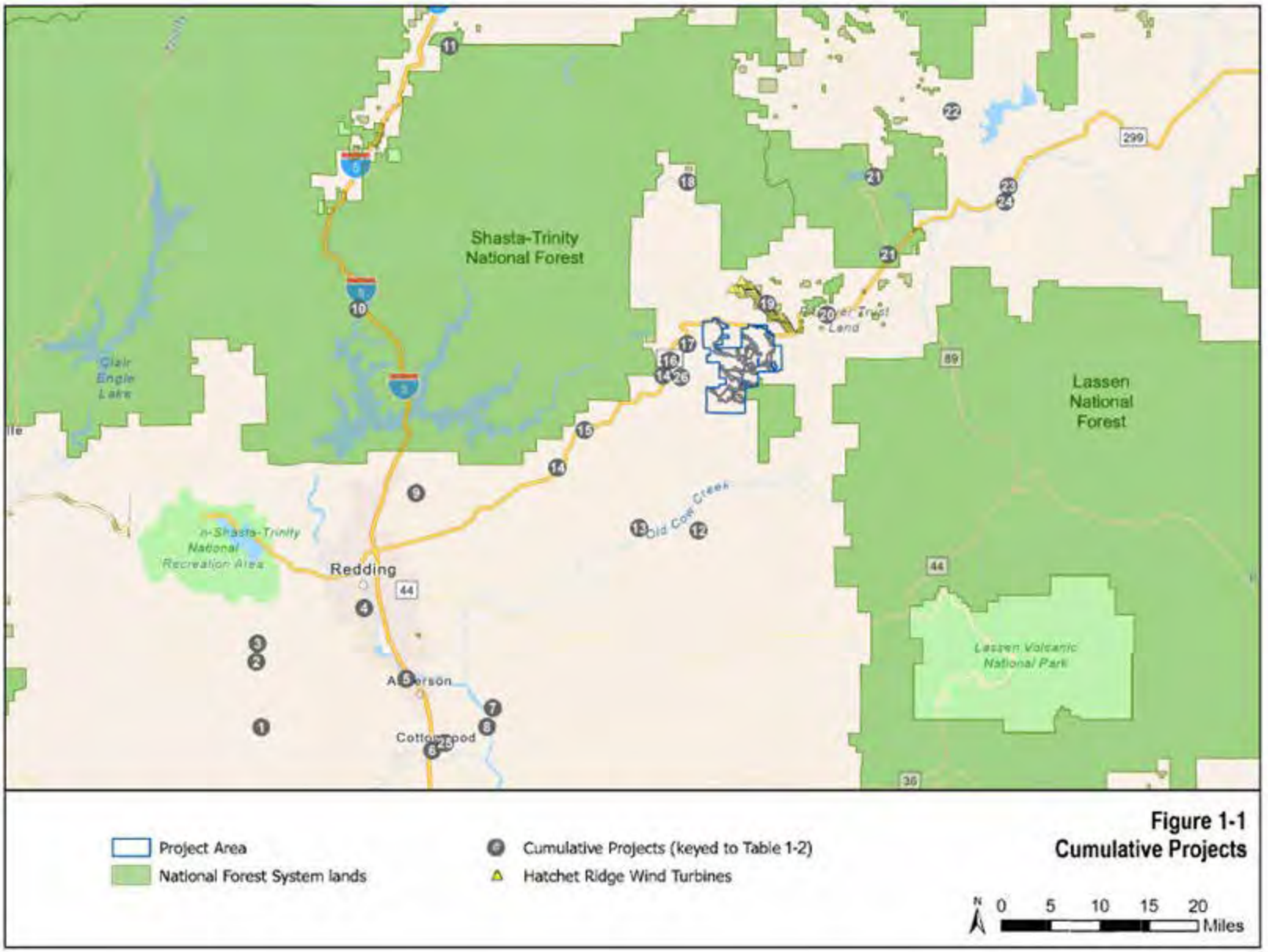


Figure 1-1
Cumulative Projects

1.3 References

CPUC 2023 – California Public Utilities Commission (CPUC). Round Mountain 500 kV Area Dynamic Reactive Support Project. Accessed on August 29, 2023. Accessed online at: https://ia.cpuc.ca.gov/environment/info/esa/round_mountain/index.html

CAISO 2024 – California Independent System Operator (CAISO). Cluster 15 Interconnection Requests. Dated January 3, 2024. Accessed on January 11, 2024. Accessed online at: https://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx

CAL FIRE 2023 – California Department of Forestry and Fire Protection (CAL FIRE). CAL FIRE Forest Health Online Project Map. Accessed August 14, 2023. Accessed online at: https://www.fire.ca.gov/what-we-do/natural-resource-management/forest-health

Caltrans 2023 – California Department of Transportation (Caltrans). Shasta County Projects. Accessed August 29, 2023. Accessed online at: https://dot.ca.gov/caltrans-near-me/district-2/d2-projects/d2-shasta-county-projects-map/

CEQANet 2023 – Lower Gas Point Road at North Fork Cottonwood Creek Bridge (No. 6c-024) Replacement Project. Accessed August 29, 2023. Accessed online at: https://ceqanet.opr.Construction Journal 2023. Construction Journal by ConstructConnect. Accessed August 10, 2023. Accessed online at: https://www.constructionjournal.com/

DOF 2023a – California Department of Finance (DOF). E-5 Population and Housing Estimates for Cities, Counties, and the State, 2020-2023. Accessed August 10, 2023. Accessed online at: https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2023/

DOF 2023b – California Department of Finance (DOF). Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. July 2023. Accessed August 08, 2023. Accessed online at: https://dof.ca.gov/forecasting/demographics/projections/

DOT 2022 – Department of Transportation (DOT). Shasta County Economic Forecast. Accessed August 09, 2023. Accessed online at: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/data-analytics-services/transportation-economics/socioeconomic-forecasts/2022/shasta-2022-a11y.pdf

Energize Innovation 2023 – Burney-Hat Creek Bioenergy. Accessed August 10, 2023. Accessed online at: https://www.energizeinnovation.fund/projects/burney-hat-creek-bioenergy

FWPA – Fountain Wind Project Application (TN 251663). Project Description, dated August 17, 2023. Accessed online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Pattern Energy 2023 – Hatchet Ridge Wind. Accessed August 10, 2023. Accessed online at: https://patternenergy.com/projects/hatchet-ridge-wind/

Redding 2023 – Bridge Inspections: Shasta County, California. Accessed August 10, 2023. Accessed online at: https://data.redding.com/bridge/california/shasta/06089/

Shasta County Planning Division 2023 – Shasta County Department of Resource Management, Planning Division (Shasta County Planning Division). Report to the Shasta County Planning Commission. Project Identification: Zone Amendment 23-0001 Large Wind Energy Systems County-Wide (Zoning Text Amendment). Meeting date February 9, 2023. Agenda item # R6. Accessed August 18, 2023. Accessed online at: https://www.shastacounty.gov/sites/default/files/fileattachments/planning/page/4082/r6020923.pdf

Shasta County Planning Division 2020 – Shasta County Department of Resource Management, Planning Division (Shasta County Planning Division). Shasta County 2020-2028 Housing Element. Adopted July 28, 2020. Accessed August 2, 2023. Accessed online at: https://www.shastacounty.gov/planning/page/73-2020-2028-housing-element

Shasta County Planning Division 2004 – Shasta County Department of Resource Management, Planning Division (Shasta County Planning Division). Shasta County General Plan As Amended Through September 2004. Accessed August 2, 2023. Accessed online at: https://www.shastacounty.gov/planning/page/general-plan

Shasta County Public Works 2023a – Shasta County Department of Public Works (Shasta County Public Works). Public Works – Projects. Accessed August 8, 2023. Accessed online at: https://www.shastacounty.gov/public-works/page/projects

Shasta County Public Works 2023b – Shasta County Department of Public Works (Shasta County Public Works). Cassel-Fall River Road at Pit River Bridge Replacement. Accessed August 08, 2023. Accessed online at: https://www.shastacounty.gov/public-works/project/cassel-fall-river-road-pit-river-bridge-replacement

Shasta Regional Transportation Agency 2023 – Draft Supplemental Environmental Impact Report for the 2022 Regional Transportation Plan and Sustainable Communities Strategy for the Shasta Region. Accessed August 8, 2023. Accessed online at: https://srta.ca.gov/DocumentCenter/View/9061/Supplemental-EIR-for-the-2022-RTPSCS-for-the-Shasta-Region

Shasta Regional Transportation Agency 2018 – Supplemental Environmental Impact Report for the 2018 Regional Transportation Plan and Sustainable Communities Strategy. Appendix B. Accessed August 8, 2023. Accessed online at:

https://srta.ca.gov/DocumentCenter/View/4287/2018-Supplemental-Environmental-Impact-Report-for-2018-RTPSCS-for-certification-Oct-9-2018?bidId=

USFS 2023 – United States Forest Service (USFS). Projects. Accessed August 23, 2023. Accessed online at: https://www.fs.usda.gov/projects/lassen/landmanagement/projects

USFS 1992 – United States Forest Service (USFS). Land and Resource Management Plan. Lassen National Forest. Accessed August 8, 2023. Accessed online at: https://www.fs.usda.gov/main/lassen/landmanagement/planning

Appendix 2

Mailing List

Appendix 2: Mailing List

The following is the mailing list for the Fountain Wind Project.

The following is a list of the State agencies that received State Clearinghouse notices and documents:

- California Air Resources Board (ARB)
- California Department of Fish and Wildlife, Northern Region 1 (CDFW)
- California Department of Forestry and Fire Protection
- California Department of Parks and Recreation
- California Department of Transportation, District 2 (DOT)
- California Emergency Management Agency
- California Energy Commission
- California Native American Heritage Commission (NAHC)
- California Natural Resources Agency
- California Public Utilities Commission (CPUC)
- California Regional Water Quality Control Board, Region 5 (RWQCB)
- Department of Toxic Substances Control
- Office of Historic Preservation
- State Water Resources Control Board, Division of Water Quality

Table 2-1 presents the list of occupants and property owners contiguous to the project site and a list of property owners within 1,000 feet of the project site and 500 feet of project linears.

Table 2-2 presents the list of agencies, including responsible and trustee agencies and the public library.

Table 2-3 presents the list of interested parties.

TABLE 2-1 OWNERS AND OCCUPANTS OF PROPERTY CONTIGUOUS TO PROJECT SITE OWNERS WITHIN 1,000 FEET OF PROJECT SITE AND 500 FEET OF PROJECT LINEARS

Name	Address	City	State	Zip
SHASTA CASCADE TIMBERLANDS LLC	PO BOX 3349	ALBANY	GA	31706
BUFFUM GENE W & CHARLENE M REV TRUST	330 WOODHILL DR	REDDING	CA	96003
VALDES KAREN M	1432 SARDINE CREEK RD	GOLD HILL	OR	97525
LAMMERS TRUST	20037 FALCON DR	REDDING	CA	96002
MOOSE RECREATIONAL CAMP	PO BOX 491587	REDDING	CA	96049
SIERRA PACIFIC LAND & TIMBER COMPANY	PO BOX 496028	REDDING	CA	96049
OCCUPANT	19400 BUNCHGRASS LOOKOUT RD	BURNEY	CA	96013
LOFARO JOSEPH PAUL	2265 ALYSHEBA CT	NAPA	CA	94559
CALDWELL FAMILY REV TRUST OF 2002	2251 ALDEN AVE	REDDING	CA	96002
OCCUPANT	19102 BOOTLEG LN	MONTGOMERY CREEK	CA	96065
COLE JOHN D JR FAMILY TRUST	121 COLBY LN	WINTERS	CA	95694
LOFARO JOSEPH PAUL	2265 ALYSHEBA CT	NAPA	CA	94559
LAMMERS TRUST	20037 FALCON DR	REDDING	CA	96002
FORSTER JAMES RICHARD & CAROL MALLORY LIV TRUST	19697 STATE HIGHWAY 89	HAT CREEK	CA	96040
DOGWOOD ACRES LLC	19697 STATE HIGHWAY 89	HAT CREEK	CA	96040
HELMS ERIC E & SHELLIE D	21076 OLD ALTURAS RD	REDDING	CA	96003
AREA H LLC	PO BOX 990898	REDDING	CA	96099
UNITED STATES FOREST SERVICE	3644 AVTECH PKWY	REDDING	CA	96002
RRF SHASTA LLC	PO BOX 990898	REDDING	CA	96099

TABLE 2-2 AGENCIES

Name	Title	Agency	Address	City	State	Zip
BRADLEY, MIKE	REGION CHIEF	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION	6105 AIRPORT ROAD	REDDING	CA	96002
ROWE, BENJAMIN	SHU UNIT FORESTER	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION	6105 AIRPORT ROAD	REDDING	CA	96002
HUFF, ERIC	ASSISTANT DEPUTY DIRECTOR	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION	6105 AIRPORT ROAD	REDDING	CA	96002
RAMALEY, JOHN	FORESTER III	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION	6105 AIRPORT ROAD	REDDING	CA	96002
GRAH, KATHY	SENIOR TRANSPORTATION PLANNER	CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 2	1657 RIVERSIDE DR	REDDING	CA	96001
KELLEY, MATTHEW P.	PROJECT MANAGER	U.S ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT, REDDING OFFICE	310 HEMSTED DRIVE, SUITE 310	REDDING	CA	96002
MATA, JENNIFER	FIELD MANAGER	U.S BUREAU OF LAND MANAGEMENT, REDDING	6640 LOCKHEED DRIVE	REDDING	CA	96002
SOLINKSY, WILLIAM D	FORESTER III	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION	6105 AIRPORT ROAD	REDDING	CA	96002
GONZALEZ, MARCELINO	REGIONAL TRANSPORTATION PLANNER	CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 2	1657 RIVERSIDE DR	REDDING	CA	96001
BROWN, JEFF	CHIEF OF DIVISION OF AERONAUTICS	CALTRANS DIVISION OF AERONAUTICS	1657 RIVERSIDE DR	REDDING	CA	96001
ABOU-TALEB, MUSTAFA		CALIFORNIA EMERGENCY MANAGEMENT AGENCY	3650 SCHRIEVER AVENUE	MATHER	CA	95655 -4203
NORRIS, DR. JENNIFER	DEPUTY SECRETARY FOR BIODIVERSITY AND HABITAT	U.S FISH AND WILDLIFE SERVICE	310 HEMSTED DRIVE, SUITE 310	REDDING	CA	96002
TREVOR SUPER		U.S FISH AND WILDLIFE SERVICE	1829 S OREGON ST	YREKA	CA	96097
BRONWYN HOGAN	BAT SPECIALIST	U.S FISH AND WILDLIFE SERVICE	1829 S OREGON ST	YREKA	CA	96097

TABLE 2-2 AGENCIES

Name	Title	Agency	Address	City	State	Zip
BERCHTOLD, DANNAS J.	ENGINEERING ASSOCIATE	CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD	364 KNOLLCREST DRIVE STE 205	REDDING	CA	96002
BRYAN SMITH	PROGRAM MANAGER	CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD	364 KNOLLCREST DRIVE STE 205	REDDING	CA	96002
BABCOCK, CURT	PROGRAM MANAGER	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	601 LOCUST STREET	REDDING	CA	96002
MCKANNAY, ADAM	INTERIOR HABITAT CONSERVATION PROGRAM MANAGER	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	601 LOCUST STREET	REDDING	CA	96002
HUBBARD, KRISTIN	ENVIRONMENTAL SCIENTIST	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	601 LOCUST STREET	REDDING	CA	96002
BRENDA HERNANDEZ CARUSO	ASSOCIATE TRANSPORTATION PLANNER--REGIONAL PLANNING AND LOCAL DEVELOPMENT REVIEW	CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 2	1657 RIVERSIDE DRIVE	REDDING	CA	96001
SALAZAR, LIO	SENIOR PLANNER	SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT	1855 PLACER STREET, SUITE 103	REDDING	CA	96001
HELLMAN, PAUL		SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT, PLANNING DIVISION	1855 PLACER STREET	REDDING	CA	96001
HEATHER BEELER	REGION 8 EAGLE PERMIT COORDINATOR	U.S FISH AND WILDLIFE SERVICE	2800 COTTAGE WAY	SACRAMENTO	CA	95825
THOMAS LEEMAN	REGION 8 DEPUTY CHIEF MIG BIRDS	U.S FISH AND WILDLIFE SERVICE	2800 COTTAGE WAY	SACRAMENTO	CA	95825
PHILLIP MILLER	INTERIM DIVISION CHIEF	CALTRANS DIVISION OF AERONAUTICS	1120 N STREET	SACRAMENTO	CA	95814
ROBERT GOYENECHE	EMERGENCY SERVICES COORDINATOR	CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES	3791 BRADVIEW DR	SACRAMENTO	CA	95827

TABLE 2-2 AGENCIES						
Name	**Title**	**Agency**	**Address**	**City**	**State**	**Zip**
		SHASTA COUNTY SHERIFF	300 PARK MARINA CIRCLE	REDDING	CA	96001
DEBRA HAWK	SENIOR ENVIRONMENTAL SCIENTIST, SUPERVISOR	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	601 LOCUST STREET	REDDING	CA	96001
RHIANNON MULLIGAN	CDFW RENEWABLE ENERGY COORDINATOR/SR. ENVIRONMENTAL SCIENTIST (SPECIALIST)	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	601 LOCUST STREET	REDDING	CA	96001
TINA BARTLETT	REGIONAL MANAGER	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	601 LOCUST STREET	REDDING	CA	96001
WAYNE LORENTZEN	DIVISION CHIEF--PERMITTING DIVISION, HAZARDOUS WASTE MANAGEMENT PROGRAM	CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL	8800 CAL CENTER DRIVE	SACRAMENTO	CA	95826
LORI KOCH	BRANCH CHIEF--PERMITTING DIVISION, HAZARDOUS WASTE MANAGEMENT PROGRAM	DEPARTMENT OF TOXIC SUBSTANCES CONTROL	1001 I STREET	SACRAMENTO	CA	95814
MUZHDA FEROUZ	BRANCH CHIEF--PERMITTING DIVISION, HAZARDOUS WASTE MANAGEMENT PROGRAM	DEPARTMENT OF TOXIC SUBSTANCES CONTROL	1001 I STREET	SACRAMENTO	CA	95814
PHILLIP CRADER		STATE WATER BOARD	1001 I STREET, 15TH FLOOR	SACRAMENTO	CA	95814

TABLE 2-2 AGENCIES						
Name	**Title**	**Agency**	**Address**	**City**	**State**	**Zip**
CLINT SNYDER	ASSISTANT EXECUTIVE OFFICER, NPDES/401 PROGRAMS	CENTRAL VALLEY REGIONAL WATER BOARD	364 KNOLLCREST DRIVE, SUITE 205	REDDING	CA	96002
LYNN COSTER	401 PROGRAM MANAGER	CENTRAL VALLEY REGIONAL WATER BOARD	364 KNOLLCREST DRIVE, SUITE 2052	REDDING	CA	96002
STEPHANIE TADLOCK	SENIOR ENVIRONMENTAL SCIENTIST	CENTRAL VALLEY REGIONAL WATER BOARD	364 KNOLLCREST DRIVE, SUITE 2052	REDDING	CA	96002
ALEXANDER HARLLEE BRANCH	SENIOR ATTORNEY	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	1001 I STREET	SACRAMENTO	CA	95814
KATHERINE BLANCHARD	SENIOR ENVIRONMENTAL SCIENTIST	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE	1001 I STREET	SACRAMENTO	CA	95814
PAUL HELLMAN	PLANNING DIVISION DIRECTOR	SHASTA COUNTY	1855 PLACER STREET	REDDING	CA	96001
RUBIN CRUSE	ATTORNEY	SHASTA COUNTY	1855 PLACER STREET	REDDING	CA	96001
JAMES ROSS	ATTORNEY	SHASTA COUNTY	1855 PLACER STREET	REDDING	CA	96001
LIO SALAZAR	PLANNING DIVISION MANAGER	SHASTA COUNTY	1855 PLACER STREET	REDDING	CA	96001
MARY WILLIAMS	ACTING CEO	SHASTA COUNTY	1855 PLACER STREET	REDDING	CA	96001
ADD'L CONTACTS FROM CEC & ASPEN						
EWING, SEAN	BUILDING DIVISON MANAGER/BUILDING OFFICIAL	SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT	1855 PLACER STREET, SUITE 102	REDDING	CA	96001
JIM WHITTLE, REHS	ENVIRONMENTAL HEALTH DIRECTOR	SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT, ENVIRONMENTAL HEALTH DIVISION	1855 PLACER STREET, SUITE 102	REDDING	CA	96001
LYNN COSTER	STROMWATER UNIT CHIEF	CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD	364 KNOLLCREST DRIVE STE 205	REDDING	CA	96002

TABLE 2-2 AGENCIES

Name	Title	Agency	Address	City	State	Zip
POLANCO, JULIANNE	STATE HISTORIC PRESERVATION OFFICER	OFFICE OF HISTORIC PRESERVATION	1725 23RD STREET, SUITE 100	SACRAMENTO	CA	95816
SAUNDERS, JENAN	DEPUTY SHPO, TRIBAL LIAISON	OFFICE OF HISTORIC PRESERVATION	1725 23RD STREET, SUITE 100	SACRAMENTO	CA	95816
LARSEN, SHANE	FORESTRY ASSISTANCE SPECIALIST	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION	6105 AIRPORT ROAD	REDDING	CA	96002
ELAINE SISON-LEBRILLA	MANAGER--CEQA AND FERC BRANCH	CALIFORNIA PUBLIC UTILITIES COMMISSION	505 VAN NESS AVE	SAN FRANCISCO	CA	94102
ROB BONTA	ATTORNEY GENERAL	CALIFORNIA DEPARTMENT OF JUSTICE--OFFICE OF THE ATTORNEY GENERAL	1300 "I" STREET	SACRAMENTO	CA	95814 -2919
ROB STAHL	AIR QUALITY DISTRICT MANAGER	SHASTA COUNTY AIR QUALITY MANAGEMENT DISTRICT	1855 PLACER STREET, SUITE 101	REDDING	CA	96001
SCOTT ROSS	SHASTA COUNTY FIRE INSPECTOR	SHASTA COUNTY FIRE DEPARTMENT	875 CYPRESS AVE	REDDING	CA	96001
JAKE SJOLUND	AERIAL OPS MANAGER	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION			CA	
SEAN O'HARA	UNIT CHIEF– SHASTA TRINITY UNIT	CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION /SHASTA COUNTY	875 CYPRESS AVE	REDDING	CA	96001
CRISTY SANADA		CALIFORNIA INDEPENDENT SYSTEM OPERATOR	P.O. BOX 639014	FOLSOM	CA	95630
SEAN TIEDGEN, AICP		SHASTA REGIONAL TRANSPORTATION AGENCY	1255 EAST STREET	REDDING	CA	96001
		BURNEY LIBRARY	37116 MAIN STREET	BURNEY	CA	96013

TABLE 2-3 INTERESTED PARTIES						
First Name	**Last Name**	**Organization**	**Address**	**City**	**State**	**Zip**
NONE	NONE	NONE	NONE	NONE	NONE	NONE