Mulqueeney Ranch Wind Repowering Project
Final Subsequent Environmental Impact Report

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Acronyms and Abbreviations

Term	Definition
°C	degree Celsius
μg/m³	microgram per cubic meter
AADT	annual average daily traffic
AAQA	ambient air quality analysis
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACDEH	Alameda County Department of Environmental Health
ACE	Altamont Corridor Express
ACFD	Alameda County Fire Department
ACHP	Advisory Council on Historic Preservation
ACPWA	Alameda County Public Works Agency
ADA	Americans with Disabilities Act
ADC	Alternative Daily Cover
ADT	Average Daily Traffic
af	acre-feet
ALUC	Airport Land Use Commission
ALUCP	San Joaquin County Airport Land Use Compatibility Plan
APWRA	Altamont Pass Wind Resource Area
ASTM	American Society of Testing and Materials
AVE	Area of Visual Effect
BAAQMD	Bay Area Air Quality Management District
Basin Plan	San Francisco Bay Basin Region
Basin Plans	Water Quality Control Plans
Bay Area	San Francisco Bay Area
BBCS	Bird and Bat Conservation Strategy
BCR	Bird Conservation Region
BMPs	best management practices
BPS	best performance standards
Brookfield	Brookfield Renewable
C.F.R.	Code of Federal Regulations
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFÉ	Corporate Average Fuel Economy Standards
CAISO	California Independent System Operator
CAL FIRE	Department of Forestry and Fire Protection
CalFire	California Department of Forestry and Fire Protection
Cal-OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board

Term	Definition
CATP	Alameda Countywide Active Transportation Plan
CBSC	California Building Standards Code
CCAA	California Clean Air Act
CCAP	Community Climate Action Plan
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGS	California Geological Survey
CHP	California Highway Patrol
CMA	Congestion Management Agency
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
COD	commercial operation date
Construction General Permit	NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ)
County	Alameda County
CPI	consumer price index
CREC	controlled recognized environmental conditions
CRHR	California Register of Historical Resources
CTC	County Transportation Commission
CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CURE	California Unions for Reliable Energy
CWA	Clean Water Act
dBa	A-weighted decibels
dBC	C-Weighted Decibel
Delta	San Joaquin–Sacramento Delta
DFG	California Department of Fish and Game
DPM	diesel particulate matter
DPS	Distinct Population Segment
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EACCS	East Alameda Conservation Strategy
EBRPD	East Bay Regional Park District
ECAP	East County Area Plan
ECP	Eagle Conservation Plan
EDF	Environmental Defense Fund

Term	Definition
EDR	Environmental Data Resources, Inc.
EIR	Environmental Impact Report
EO	Executive Order
EPA	Federal Environmental Protection Agency
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EUC	eagle use count
FAA	Federal Aviation Administration
Fed. Reg.	Federal Register
FEMA	Federal Emergency Management Agency
FHA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
Friant Ranch Decision	California Supreme Court's decision in Sierra Club v. County of Fresno (6 Cal. 5th 502)
Friant Ranch Project	Community Plan Update and Friant Ranch Specific Plan
GHG	greenhouse gas
GIS	Global information system
Guidelines	Land-Based Wind Energy Guidelines
GVWR	gross vehicle weight rating
GWP	global warming potential
H&S	Health and Safety
HDD	horizontal directional drilling
HFC	hydrofluorocarbons
HI	hazard index
HMBP	Hazardous Materials Business Plan
HRECs	historical recognized environmental conditions
I-580	Interstate 580
IPCC	Intergovernmental Panel on Climate Change
KOPs	key observation points
kV	kilovolt
LAP	Local Area Population
LARPD	Livermore Area Recreation and Park District
LCFS	Low Carbon Fuel Standard
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LID	Low impact development
L_{max}	maximum sound level
LOS	level of service
Master Plan	East Bay Regional Park District Master Plan
MBTA	Migratory Bird Treaty Act
mg/L	milligrams per liter
MHWRA	Montezuma Hills Wind Resource Area
MRZ	Mineral Resource Zone

Term	Definition
MTS	Metropolitan Transportation System
Mulqueeney Wind	Mulqueeney Wind Energy, LLC
MW	megawatts
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NABCI	U.S North American Bird Conservation Initiative
NAHC	Native American Heritage Commission
NCCP	natural community conservation plan
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administrative
NO	nitric oxide
NOA	naturally occurring asbestos
NOP	notice of preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	New Source Review
NWIC	Northwest Information Center
O&M	operations and maintenance
OHWM	ordinary high water mark
Open Space Element	Open Space Element of the General Plan
OPR	Office of Planning and Research
PEIR	Altamont Pass Wind Resource Area Program EIR
PEIR	Program Environmental Impact Report
PFC	perfluorocarbons
PG&E	Pacific Gas and Electric Company
Phase I ESA	Phase I Environmental Site Assessment Process
PM10	particulate matter 10 microns or less in diameter
PM2.5	particulate matter 2.5 microns or less in diameter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppm	part per million
PRC	Public Resources Code
PRDs	Permit Registration Documents
project or proposed project	Sand Hill Wind Repowering Project
project	Mulqueeney Ranch Wind Repowering Project
RCMP	Regional Congestion Management Program
RCRA	Resource Conservation and Recovery Act of 1976
REA	Resource Equivalency Analysis
RECs	recognized environmental conditions
Regional Water Boards	Regional Water Resources Control Boards
RHNA	Regional Housing Need Assessment
ROG	reactive organic gas

Term	Definition
ROW	right-of-way
RPS	Renewables Portfolio Standard
RSA	rotor-swept area
RWQCB	Regional Water Quality Control Board
SAFE	Safer Affordable Fuel-Efficient
Sand Hill	Sand Hill Wind, LLC
SB	Senate Bill
Scenic Route Element	Scenic Route Element of the Alameda County General Plan
Scoping Plan	2017 Climate Change Scoping Plan
SEIR	Subsequent Environmental Impact Report
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLCP	Short-Lived Climate Pollutants
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures
SR	State Route
SRAs	State Responsibility Areas
State Water Board	State Water Resources Control Board
SVP	Society of Vertebrate Paleontology
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	technical advisory committee
TAC	toxic air contaminant
Tanner Act	Toxic Air Contaminant Identification and Control Act
TCP	Traffic Control Plan
TDM	Transportation Demand Management
TDS	total dissolved solids
TTH	total turbine height
UCMP	University of California Museum of Paleontology
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
waters of the state	waters of the State of California
WBWG	Western Bat Working Group
WDRs	waste discharge requirements
SLCP	Short-Lived Climate Pollutants
SO_2	sulfur dioxide

Term	Definition
SPCC	Spill Prevention Control and Countermeasures
SR	State Route
SRAs	State Responsibility Areas
State Water Board	State Water Resources Control Board
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USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
waters of the state	waters of the State of California
WBWG	Western Bat Working Group
WDRs	waste discharge requirements

Executive Summary

The County of Alameda (County) ~~is preparing~~ has prepared this Subsequent Environmental Impact Report (SEIR) to examine the environmental effects of the Mulqueeney Ranch Wind Repowering Project (project or proposed project). The project site is located within the Altamont Pass Wind Resource Area (APWRA) in eastern Alameda County. As required by Section 15123 of the State California Environmental Quality Act (CEQA) Guidelines, this Executive Summary contains the following sections.

- Project Overview
- Project Objectives
- Project Impacts and Mitigation Measures
- Project Alternatives
- Potential Areas of Controversy and Issues to be Resolved

This SEIR analyzes the environmental effects of the proposed project, recommends measures to reduce or avoid potential environmental damage resulting from the project, and identifies alternatives to the proposed project. This SEIR also describes any significant environmental effects that cannot be avoided, growth-inducing effects, effects found not to be significant, and cumulative impacts.

Environmental review of the project under CEQA began with the preparation, approval, and certification of the Altamont Pass Wind Resource Area Program EIR (PEIR) in December 2014, pursuant to CEQA Guidelines Section 15168 (State Clearinghouse #2010082063). The proposed project was a foreseeable project at the time the PEIR was prepared and was listed as such in the PEIR. Since the PEIR was certified, the County has previously approved four other wind repowering projects that had been tiered under similar documentation. The County decided to prepare this SEIR in the context of new information that has become available since certification of the PEIR and based on its determination that the current project proposes turbines with characteristics sufficiently distinct from those described in the PEIR that they could result in new or different impacts than those presented in the PEIR. The requirements for a subsequent SEIR, under CEQA, are set out in State CEQA Guidelines Section 15162.

ES.1 Project Overview

Mulqueeney Wind Energy, LLC (Mulqueeney Wind) is proposing the Mulqueeney Ranch Wind Repowering Project (project) on 29 privately owned parcels that form a site of approximately 4,600 acres in the Altamont Pass Wind Resource Area (APWRA). The proposed project would entail the replacement of approximately 518 old generation wind turbines installed in the 1980s with up to 36 new wind turbines and is expected to utilize turbines with generating capacities between 2.2 and 4.2 megawatts (MW) each, all generally similar in size and appearance, to develop up to 80 MW of generating capacity. The project is proposed as a Conditional Use Permit (Alameda County Planning case PLN2019-00226) and is reviewed in this SEIR pursuant to the California Environmental Quality Act (CEQA) Guidelines, Section 15162, as a project tiered under the PEIR.

ES.2 Project Objectives

The underlying purpose of the proposed project is to repower a large segment of the program area with a commercially viable wind energy facility that would help meet the state's Renewables Portfolio Standard (RPS), greenhouse gas (GHG) reduction, and carbon neutrality goals.

The fundamental objective of the project is as follows:

- To ~~site up to 36~~ install new wind turbines that will produce and deliver 80 megawatts (MW) of commercially viable wind energy to the electrical grid through a long-term power purchase agreement with a local community choice aggregator, using up to 36 wind turbines while using the least number of locations to achieve the production objective within the environmental and other regulatory and physical constraints of the project site.

The secondary objectives of the proposed project are as follows:

- To achieve the above fundamental objectives while avoiding and minimizing environmental impacts by:
  - Constructing the turbines and necessary infrastructure with the appropriate use of scientific observation to site turbines to avoid and minimize adverse effects and mortality of native plants, terrestrial species, bats and birds;
  - ~~Improving understanding by the wind industry, regulators, and the scientific community of the effects of new generation turbines on birds and bats by applying~~ Operating an avian ~~mortality~~ fatality monitoring ~~protocol that is~~ program in accordance with the mitigation measures and survey protocols established in the APWRA Repowering Program EIR and based on the latest science and monitoring results to determine whether applicable thresholds are exceeded, and, if needed, implementing adaptive management measures to reduce fatalities of focal raptor species to levels below the thresholds established in the Program EIR; and
  - Contributing financial and scientific resources to the conservation and enhancement of protected bird and bat species in the APWRA region, consistent with mitigation measures identified in the PEIR for repowering the APWRA.
- To increase local short-term and long-term employment opportunities.
- To contribute to repowering of the APWRA and provide economic benefits to Alameda County.

ES.3 Project Impacts and Mitigation Measures

This SEIR discusses the project's potential environmental effects, and identifies mitigation measures to avoid or reduce any significant impacts to less-than-significant levels, where feasible. This SEIR is focused on how the project effects may differ from the projects described in the PEIR and on new information. Environmental topic areas and resources considered and dismissed from further evaluation are distinguished from those considered in detail in Chapter 1, *Introduction*. Sections 3.1

through 3.19 provide comprehensive discussions of the regulatory and environmental setting for the environmental resources affected by the project, and identify project impacts and mitigation measures designed to reduce significant impacts. Table ES-1, *Summary of Impacts and Mitigation Measures*, summarizes the impacts and mitigation measures identified for the project.

ES.3.1 Summary of Project Impacts

The project impacts are summarized in Table ES-1 (presented at the end of this summary). For potentially significant impacts, mitigation measures are identified where feasible to reduce the impact on the environmental resources to a less-than-significant level. Chapter 3, *Impact Analysis*, provides a detailed discussion of impacts and mitigation measures for the proposed project.

ES.3.2 Significant and Unavoidable Impacts

Section 15126.2(b) of the State CEQA Guidelines requires that the EIR describe any significant impacts, including those that can be mitigated but not reduced to less-than-significant levels. The following environmental impacts were determined to be significant and unavoidable.

ES.3.2.1 Biological Resources

Impact BIO-11: Avian mortality resulting from interaction with wind energy facilities

Impact BIO-14: Turbine-related fatalities of special-status and other bats

Impact BIO-19: Potential impact on the movement of any native resident or migratory wildlife species or established native resident or migratory wildlife corridors, and the use of native wildlife nursery sites

ES.3.2.2 Cumulative Impacts

Air Quality

Construction-related emissions of ROG and NOx would be substantial, resulting in a cumulatively considerable contribution to a cumulative impact.

Biological Resources

Mortality of burrowing owl, golden eagle, and hoary bats from interaction with wind energy facilities would result in a cumulatively considerable contribution to a cumulative impact.

ES.4 Project Alternatives

Chapter 4, *Alternatives Analysis*, provides an evaluation of alternatives that would avoid or lessen significant effects of the project and that would feasibly attain the fundamental objective and most of the secondary project objectives. These alternatives are described below.

ES.4.1 No Project – No Repowering Alternative

Under the No Project – No Repowering alternative, no repowering would occur, and the project area would remain in its existing condition.

ES.4.2 Micro-Sited Alternative

Under the Micro-Sited Alternative, the applicant would install the same number of turbines as the project, but they would be placed at ~~locates~~ locations determined through the completed micro-siting study (Appendix F) that was prepared for the project with the objective to reduce avian impacts. Based on this study, this alternative would locate 31 of the project's 36 turbines at different sites to reduce individual turbine bird strike risks, would continue to limit operational capacity to 80 MW, and would maintain the same RSA as the project at 40.7 hectares.

ES.4.3 Reduced Project Alternative

The Reduced Project Alternative would eliminate one third, or ~~approximately~~ 12, of the project's 36 turbine sites while retaining an operational capacity of 80 MW, and would reduce the rotor-swept area (RSA) from 40.7 to 32.8 total hectares, a 19 percent reduction compared to the project. This alternative would also place all turbines at least 0.5 mile from golden eagle nests and eagle activity centers. The number of turbines placed within 1 mile of eagle nests and eagle activity centers would be reduced to 7, compared to 13 turbines for the proposed project. In total, the Reduced Project Alternative would reduce the number of high-risk turbines to 2, compared to 11 under the proposed project, based on the micro-siting studies. Furthermore, the cut-in speed would be increased to 5 m/s (depending upon final turbine model selected) during all daylight hours~~,~~ year-round to reduce daylight operational hours by 50%, curtailing generation output in order to reduce potential impacts on golden eagles. The proposed cut-in speed increase would result in a substantial reduction in eagle fatalities, relative to the project, but also would have significant benefits to other raptors and smaller birds. This would be in addition to the benefit produced by the 19% reduction in RSA compared to the proposed project.

ES.5 Potential Areas of Controversy/Issues to be Resolved

The County issued a NOP in April 2020 that provided public agencies and the public with a detailed project description and an analysis of how the project would tier off of the PEIR, and the County has elected to prepare this SEIR.

Areas of controversy were identified through written agency and public comments received during the public review of the NOP and are provided in Appendix A. The following issues were identified as areas of concern during scoping and are addressed in the appropriate sections of Chapter 3, *Impact Analysis*.

- Biological resources, especially Avian and Bat impacts
- Hydrology, specifically changes in overland flow and drainage
- Aesthetics, nighttime lighting, turbine size and structure, and micro-siting assessment
- Cumulative Impacts.

ES.6 ~~How to Comment on this~~ Comments on the Draft Subsequent EIR

~~This draft SEIR, incorporating public and agency responses to the Notice of Preparation (NOP), is being circulated for review and comment by appropriate state agencies, as well as organizations and individuals who have requested notification. In accordance with Section 15205(d) of the State CEQA Guidelines, the County has scheduled a 45-day public review period for the draft EIR, ending at 5:00 p.m. on Monday, December 21, 2020. Within that 45-day period, the county will hold one public hearing to request comments on the draft SEIR.~~

~~This draft~~ The draft SEIR was released for public review on Friday, November 6, 2020 and the comment period was extended from 45 days to over 60 days, through January 8, 2021. The draft SEIR was circulated to state agencies through the State Clearinghouse of the Governor's Office of Planning and Research. Comments on the draft SEIR were due no later than 5:00 p.m. January 8, 2021. One letter was received from the State Office of the Attorney General on January 14, 2021, which has been included in the comments received and for which responses have been prepared.

This final SEIR is available for review and download at the Alameda County Planning Department website (www.acgov.org/cda/planning, under Pending Land Use Projects, Current Development Projects, Wind Turbine Projects; see Mulqueeney Ranch). Copies will also be available for viewing during normal business hours (8:30 a.m. to 5:00 p.m.), Monday through Friday, at the Alameda County Community Development Agency, Planning Department, located at 224 West Winton Avenue, Room 111, Hayward, California, 94544~~. Comments on the draft SEIR may be submitted to the Planning Department at that address, to the attention of Andrew Young, Senior Planner, and by e-mail to andrew.young@acgov.org. Visitors to the offices are requested to call the Planning Department at (510) 670-5400 in advance to make arrangements to view the SEIR. Due to the 2020 COVID-19 pandemic the SEIR is not being provided to libraries.~~, subject to advance notice.

~~Following the close of the public review period for the draft SEIR, the County will consider the comments it receives. The County will prepare a final SEIR, incorporating all comments received during the public comment period, for consideration by the East County Board of Zoning Adjustment (EZBA), tentatively scheduled for Monday, December 21, 2020. As required by CEQA (Section 21092.5), the final SEIR including written responses to the comments submitted by public agencies, will be available at least 10 days prior to certification.~~

The County held a public hearing on December 8, 2020 to request comments on the draft EIR. The hearing was held online in a webinar format due to shelter-in-place health and safety guidelines. No verbal or other comments were received at the public hearing.

Table ES-1. Summary of Impacts and Mitigation Measures

Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Aesthetics			
Impact AES-1: Potential to have a substantial adverse effect on a scenic vista	S	PEIR Mitigation Measure AES-1: Limit construction to daylight hours PEIR Mitigation Measure AES-2b: Maintain site free of debris and restore abandoned roadways PEIR Mitigation Measure AES-2c: Screen surplus parts and materials	LTS
Impact AES-2: Potential to substantially damage scenic resources along a scenic highway	S	PEIR Mitigation Measure AES-2b: Maintain site free of debris and restore abandoned roadways PEIR Mitigation Measure AES-2c: Screen surplus parts and materials	LTS
Impact AES-3: Substantial degradation of the existing visual character or quality of the project site and its surroundings	S	PEIR Mitigation Measure AES-2b: Maintain site free of debris and restore abandoned roadways PEIR Mitigation Measure AES-2c: Screen surplus parts and materials	LTS
Impact AES-4: Creation of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	LTS	None required	LTS
Agricultural and Forestry Resources			
Impact AG-1: Conversion of Important Farmland to nonagricultural use	NI	None required	NI
Impact AG-2: Conflict with existing zoning for agricultural use or with a Williamson Act contract	NI	None required	NI
Impact AG-3: Conflict with existing zoning for forest land, timberland, or timberland zoned Timberland Production	NI	None required	NI

~~SU = significant and unavoidable; S = significant; LTS = less than significant; NI = no impact~~

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact AG-4: Loss of forest land or conversion of forest land to non-forest use	NI	None required	NI
Impact AG-5: Potential to cause changes in the existing environment that could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use	NI	None required	NI
Air Quality			
Impact AQ-1: Conflict with or obstruction of implementation of the applicable air quality plan	LTS	None required	LTS
Impact AQ-2: Cumulatively considerable net increase of any criteria pollutant for which the Project region is a nonattainment area for an applicable federal or state ambient air quality standard	S	PEIR Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures PEIR Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures 2020 NEW Mitigation Measure AQ-2c: Reduce construction-related air pollutant emissions to below BAAQMD NO_x thresholds	LTS
Impact AQ-3: Exposure of sensitive receptors to substantial pollutant concentrations	S	PEIR Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures PEIR Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures	LTS
Impact AQ-4: Generation of objectionable odors adversely affecting a substantial number of people	LTS	None required	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Biological Resources			
Impact BIO-1: Potential for ground disturbing activities to result in adverse effects on special-status plans or habitat occupied by special-status plants	S	2020 Updated PEIR Mitigation Measure BIO-1a: Conduct surveys to determine the presence of special-status plant species 2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1c: Avoid and minimize impacts on special-status plant species by establishing activity exclusion zones 2020 Updated PEIR Mitigation Measure BIO-1d: Compensate for impacts on special-status plant species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas	LTS
Impact BIO-2: Potential for the introduction and spread of invasive plant species to result in adverse effects on special-status plants and natural communities	S	2020 Updated PEIR Mitigation Measure 1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-2: Prevent introduction, spread, and establishment of invasive plant species PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact BIO-3: Potential mortality or loss of habitat for vernal pool branchiopods and curved-foot hygrotus diving beetle	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-3b: Implement measures to avoid, minimize, and mitigate impacts on vernal pool branchiopods and curved-foot hygrotus diving beetle PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	
Impact BIO-4: Potential disturbance or mortality of and loss of suitable habitat for valley elderberry longhorn beetle	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-4a: Implement measures to avoid or protect habitat for valley elderberry longhorn beetle 2020 Updated PEIR Mitigation Measure BIO-4b: Compensate for direct and indirect effects on valley elderberry longhorn beetle PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact BIO-5: Potential disturbance or mortality of and loss of suitable habitat for California tiger salamander, western spadefoot toad, California red-legged frog, and foothill yellow-legged frog	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas 2020 Updated PEIR Mitigation Measure BIO-5a: Implement best management practices to avoid and minimize effects on special-status amphibians	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		PEIR Mitigation Measure BIO-5b: Compensate for loss of habitat for special-status amphibians PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	
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Impact BIO-6: Potential disturbance or mortality of and loss of suitable habitat for western pond turtle	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-6: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed	LTS
Impact BIO-7: Potential disturbance or mortality of and loss of suitable habitat for Blainville's horned lizard, California glossy snake, Alameda whipsnake, and San Joaquin coachwhip	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands 2020 Updated PEIR Mitigation Measure BIO-7a: Implement best management practices to avoid and minimize effects on special-status reptiles PEIR Mitigation Measure BIO-7b: Compensate for loss of habitat for special-status reptiles	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact BIO-8a: Potential construction-related disturbance or mortality of special-status and ~~non-special-status non-raptor migratory birds~~ other raptors	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands	LTS
~~SU = significant and unavoidable; S = significant; LTS = less than significant; NI = no impact~~			
		2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential impacts on special-status and non-special-status nesting birds and raptors	
Impact BIO-8b: Potential construction-related disturbance or mortality of special-status and non-special-status raptors	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands 2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential impacts on special-status and non–special-status nesting birds and raptors 2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl	LTS
Impact BIO-9a: Permanent and temporary loss of occupied habitat for western burrowing owl	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands <ins>2020 Updated</ins> PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl	
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		PEIR Mitigation Measure BIO-9: Compensate for the permanent loss of occupied habitat for western burrowing owl	
Impact BIO-9b: Permanent and temporary loss of foraging habitat for tricolored blackbird and other special-status and non-special-status birds	S	PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands	LTS
Impact BIO-10: Potential injury or mortality of and loss of habitat for San Joaquin kit fox and American badger	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands <ins>2020 Updated</ins> PEIR Mitigation Measure BIO-10a: Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger PEIR Mitigation Measure BIO-10b: Compensate for loss of suitable habitat for San Joaquin kit fox and American badger	LTS
Impact BIO-11: Avian mortality resulting from interaction with wind energy facilities	S	PEIR Mitigation Measure BIO-11a: Prepare a Project-specific avian protection plan	SU

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		2020 Updated PEIR Mitigation Measure BIO-11b: Site turbines to minimize potential mortality of birds PEIR Mitigation Measure BIO-11c: Use turbine designs that reduce avian impacts PEIR Mitigation Measure BIO-11d: Incorporate avian-safe practices into design of turbine-related infrastructure PEIR Mitigation Measure BIO-11e: Retrofit existing infrastructure to minimize risk to raptors	
~~SU = significant and unavoidable; S = significant; LTS = less than significant; NI = no impact~~			
		PEIR Mitigation Measure BIO-11f: Discourage prey for raptors 2020 Updated PEIR Mitigation Measure BIO-11g: Implement postconstruction avian fatality monitoring for all repowering projects 2020 Updated PEIR Mitigation Measure BIO-11h: Compensate for the loss of avian species, including golden eagles, by contributing to conservation efforts 2020 Updated PEIR Mitigation Measure BIO-11i: Implement an avian adaptive management program	
Impact BIO-12: Potential mortality or disturbance of bats from roost removal or disturbance	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-3a: Conduct preconstruction surveys for habitat for special-status wildlife species PEIR Mitigation Measure BIO-12a: Conduct bat roost surveys PEIR Mitigation Measure BIO-12b: Avoid removing or disturbing bat roosts	LTS
Impact BIO-13: Potential for construction activities to temporarily remove or alter bat foraging habitat	S	PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact BIO-14: Turbine-related fatalities of special-status and other bats	S	2020 Updated PEIR Mitigation Measure BIO-14a: Site and select turbines to minimize potential mortality of bats 2020 Updated PEIR Mitigation Measure BIO-14b: Implement postconstruction bat fatality monitoring program for all repowering projects PEIR Mitigation measure BIO-14c: Prepare and publish annual monitoring reports on the findings of bat use of the Project area and fatality monitoring results	SU
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		2020 Updated PEIR Mitigation Measure BIO-14d: Develop and implement a bat adaptive management plan PEIR Mitigation Measure BIO-14e: Compensate for expenses incurred by rehabilitating injured bats	
Impact BIO-15: Potential for road infrastructure upgrades to result in adverse effects on alkali meadow	NI	None required	NI
Impact BIO-16: Potential for road and electrical infrastructure upgrades to result in adverse effects on riparian habitat	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-16: Compensate for the loss of riparian habitat	LTS
Impact BIO-17: Potential for ground-disturbing activities to result in direct adverse effects on common habitats	LTS	None required	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact BIO-18: Potential for road infrastructure upgrades to result in adverse effects on wetlands and streams	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas 2020 Updated PEIR Mitigation Measure BIO-18: Compensate for the loss of wetlands and streams PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact BIO-19: Potential impact on the movement of any native resident or migratory wildlife species or established native resident or migratory wildlife corridors, and the use of native wildlife nursery sites	S	2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species	SU

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		PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-3a: Conduct preconstruction surveys for habitat for special-status wildlife species 2020 Updated PEIR Mitigation Measure BIO-5a: Implement best management practices to avoid and minimize effects on special-status amphibians PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands PEIR Mitigation Measure BIO-7a: Implement best management practices to avoid and minimize effects on special-status reptiles 2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize	

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		potential impacts on special-status and non-special status nesting birds and raptors 2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl 2020 Updated PEIR Mitigation Measure BIO-10a: Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger PEIR Mitigation Measure BIO-11b: Site turbines to minimize potential mortality of birds PEIR Mitigation Measure BIO-11c: Use turbine designs that reduce avian impacts PEIR Mitigation Measure BIO-11d: Incorporate avian-safe practices into design of turbine-related infrastructure	
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		PEIR Mitigation Measure BIO-11e: Retrofit existing infrastructure to minimize risk to raptors 2020 Updated PEIR Mitigation Measure BIO-11i: Implement an avian adaptive management program PEIR Mitigation Measure BIO-12a: Conduct bat roost surveys PEIR Mitigation Measure BIO-12b: Avoid removing or disturbing bat roosts 2020 Updated PEIR Mitigation Measure BIO-14a: Site and select turbines to minimize potential mortality of bats 2020 Updated PEIR Mitigation Measure BIO-14d: Develop and implement a bat adaptive management plan	

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact BIO-20: Conflict with local plans or policies	S	PEIR Mitigation Measure BIO-1a: Conduct surveys to determine the presence or absence of special-status species 2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1c: Avoid and minimize impacts on special-status plant species by establishing activity exclusion zones PEIR Mitigation Measure BIO-1d: Compensate for impacts on special-status plant species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-2: Prevent introduction, spread, and establishment of invasive plant species	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		PEIR Mitigation Measure BIO-3a: Implement measures to avoid, minimize, and mitigate impacts on vernal pool branchiopods and curved-foot hygrotus diving beetle 2020 Updated PEIR Mitigation Measure BIO-5a: Implement best management practices to avoid and minimize effects on special-status amphibians PEIR Mitigation Measure BIO-5b: Compensate for loss of habitat for special-status amphibians PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands PEIR Mitigation Measure BIO-6: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed PEIR Mitigation Measure BIO-7a: Implement best management practices to avoid and minimize effects on special-status reptiles 2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential impacts on special-status and non–special-status nesting birds and raptors 2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl PEIR Mitigation Measure BIO-9: Compensate for the permanent loss of foraging habitat for western burrowing owl 2020 Updated PEIR Mitigation Measure BIO-10a: Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger PEIR Mitigation Measure BIO-10b: Compensate for loss of suitable habitat for San Joaquin kit fox and American badger	

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
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		PEIR Mitigation Measure BIO-11a: Prepare a Project-specific avian protection plan 2020 Updated PEIR Mitigation Measure BIO-11b: Site turbines to minimize potential mortality of birds PEIR Mitigation Measure BIO-11c: Use turbine designs that reduce avian impacts PEIR Mitigation Measure BIO-11d: Incorporate avian-safe practices into design of turbine-related infrastructure PEIR Mitigation Measure BIO-11e: Retrofit existing infrastructure to minimize risk to raptors PEIR Mitigation Measure BIO-11f: Discourage prey for raptors PEIR Mitigation Measure BIO-11g: Implement postconstruction avian fatality monitoring for all repowering projects 2020 Updated PEIR Mitigation Measure BIO-11h: Compensate for the loss of raptors and other avian species, including golden eagles, by contributing to conservation efforts 2020 Updated PEIR Mitigation Measure BIO-11i: Implement an avian adaptive management program PEIR Mitigation Measure BIO-12a: Conduct bat roost surveys PEIR Mitigation Measure BIO-12b: Avoid removing or disturbing bat roosts 2020 Updated PEIR Mitigation Measure BIO-14a: Site and select turbines to minimize potential mortality of bats 2020 Updated PEIR Mitigation Measure BIO-14d: Develop and implement a bat adaptive management plan	

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
		2020 Updated PEIR Mitigation Measure BIO-18: Compensate for the loss of wetlands and non-wetland waters	
Impact BIO-21: Conflict with provisions of an adopted HCP/NCCP or other approved local, regional, or state habitat conservation plan	NI	None required	NI
Impact BIO-22: Potential disturbance or mortality of western bumble bee	S	~~202~~ 2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands 2020 New Mitigation Measure BIO-22a: Conduct a preconstruction habitat assessment and focused surveys for western bumble bee 2020 New Mitigation Measure BIO-22b: Implement protection measures to avoid and minimize effects on western bumble bee	LTS
Impact BIO-23: Potential disturbance or mortality of monarch butterfly	LTS	None required	LTS
Cultural Resources			
Impact CUL-1: Potential to cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5	NI	None required	NI
Impact CUL-2: Potential to cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5	S	PEIR Mitigation Measure CUL-2c: Conduct worker awareness training for archaeological resources prior to construction PEIR Mitigation Measure CUL-2d: Stop work if cultural resources are encountered during ground-disturbing activities	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
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Impact CUL-3: Disturbance of any human remains, including those interred outside of dedicated cemeteries	S	PEIR Mitigation Measure CUL-3: Stop work if human remains are encountered during ground-disturbing activities	LTS
Energy			
Impact EN-1: Wasteful, inefficient, or unnecessary consumption of energy resources during Project construction or operation	LTS	None required	LTS
Impact EN-2: Conflict with or obstruction of a state or local plan for renewable energy or energy efficiency	NI	None required	NI
Geology, Soils, Mineral Resources, and Paleontological Resources			
Impact GEO-1: Potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides	S	PEIR Mitigation Measure GEO-1: Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report	LTS
Impact GEO-2: Potential to result in substantial soil erosion or the loss of topsoil	LTS	None required	LTS
Impact GEO-3: Placement of Project-related facilities on a geologic unit or soil that is unstable or that would become unstable as a result of the Project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse	S	PEIR Mitigation Measure GEO-1: Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report	LTS
Impact GEO-4: Placement of Project-related facilities on expansive soil, creating substantial direct or indirect risks to life or property	S	PEIR Mitigation Measure GEO-1: Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact GEO-5: Direct or indirect destruction of a unique paleontological resource or site or unique geologic feature	S	PEIR Mitigation Measure GEO-7a: Retain a qualified professional paleontologist to monitor significant ground-disturbing activities PEIR Mitigation Measure GEO-7b: Educate construction personnel in recognizing fossil material PEIR Mitigation Measure GEO-7c: Stop work if substantial fossil remains are encountered during construction	LTS
Greenhouse Gas Emissions			
Impact GHG-1: Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	LTS	None required	LTS
Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	S	~~2020 Updated~~ PEIR Mitigation Measure GHG-2a: Implement best available control technology for heavy-duty vehicles PEIR Mitigation Measure GHG-2b: Install low SF6 leak rate circuit breakers and monitoring PEIR Mitigation Measure GHG-2c: Require new construction to use building materials containing recycled content PEIR Mitigation Measure GHG-2d: Comply with construction and demolition debris management ordinance	LTS
Hazards and Hazardous Materials			
Impact HAZ-1: Creation of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	LTS	None required	LTS
Impact HAZ-2: Creation of 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	LTS	None required	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact HAZ-3: Emission of hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school	NI	None required	NI
Impact HAZ-4: Placement of project-related facilities on a site that is included on a list of hazardous materials sites, and resulting creation of a significant hazard to the public or the environment	~~LTS~~ S	~~None required~~ PEIR Mitigation Measure HAZ-4: Perform a Phase I Environmental Site Assessment prior to construction activities and remediate if necessary	LTS
Impact HAZ-5: Placement of project-related facilities within an airport land use plana area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area	LTS	None required	LTS
Impact HAZ-6: Impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan	S	PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan	LTS
Impact HAZ-7: Exposure of people or structures, either directly or indirectly, to a significant risk involving wildland fires	LTS	None required	LTS
Hydrology and Water Quality			
Impact WQ-1: Violation of any water quality standards or waste discharge requirements or other degradation of surface water or groundwater quality	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact WQ-2: Substantial decrease of groundwater supplies or substantial interference with groundwater recharge such that the project may impeded sustainable groundwater management of the basin	LTS	None required	LTS
Impact WQ-3: Substantial alteration of existing drainage patterns in a manner that would result in substantial erosion or siltation onsite or offsite	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
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Impact WQ-4: Substantial increase in the amount of surface runoff in a manner that would result in flooding onsite or offsite	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact WQ-5: Creation of or contribution to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact WQ-6: Obstruction or redirection of flood flows caused by drainage modifications	NI	None required	NI
Impact WQ-7: In flood hazard, tsunami, or seiche zones, risk release of pollutants as a result of project inundation	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Impact WQ-8: Conflict with or obstruction of implementation of a water quality control plan or sustainable groundwater management plan	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS
Land Use and Planning			
Impact LU-1: Physical division of an established community	NI	None required	NI
Impact LU-2: Conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect	NI	None required	NI
Noise			
Impact NOI-1: Generation of increased ambient noise levels in the project vicinity in excess of applicable standards	LTS	None required	LTS
Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels	LTS	None required	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact NOI-3: Placement of project-related activities in the vicinity of a private airstrip or an airport land use plan or within 2 miles of a public airport or public use airport, resulting in exposure of people residing or working in the project area to excessive noise levels	NI	None required	NI
Population and Housing			
Impact POP-1: Creation of substantial population growth either directly or indirectly	NI	None required	NI
Impact POP-2: Displacement of a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere	NI	None required	NI
Public Services			
Impact PS-1: Creation of a need for new or physically altered governmental facilities to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, or other public facilities	NI	None required	NI
Recreation			
Impact REC-1: Increased use of existing recreational facilities, resulting in substantial physical deterioration	NI	None required	NI
Impact REC-2: Construction or expansion of recreational facilities that might have an adverse physical effect on the environment	NI	None required	NI
Transportation			
TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities	S	PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan	LTS
TRA-2: Conflict or be inconsistent with State CEQA Guidelines 15064.3, subdivision (b)	LTS	None required	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact TRA-3: Result in change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	LTS	None required	LTS
Impact TRA-4: Substantial increase in hazards because of geometric design feature (e.g., sharp curves, dangerous intersections) or incompatible uses (e.g., farm equipment)	S	PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan	LTS
Impact TRA-5: Potential to cause inadequate emergency access	S	PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan	LTS
Tribal Cultural Resources			
Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource with cultural value to a California Native American tribe and that is 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)	LTS	None required	LTS
Impact TCR-2: Potential to cause a substantial adverse change in the significance of a tribal cultural resource with cultural value to a California Native American tribe and that is a resource determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1	LTS	None required	LTS
Utilities and Service Systems			
Impact UT-1: Relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects	LTS	None required	LTS

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Impact	Level of Significance	Mitigation Measure	Significance after Mitigation
Impact UT-2: Have sufficient water supply to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years	LTS	None required	LTS
Impact UT-3: Project-related exceedance of existing wastewater treatment capacity	NI	None required	NI
Impact UT-4: Project-related exceedance of state or local solid waste standards or of the capacity of local infrastructure, or other impediments to attaining solid waste reduction goals	LTS	None required	LTS
Impact UT-5: Inconsistency with federal, state, and local management and reduction statutes and regulations related to solid waste	NI	None required	NI
Wildfire			
Impact WF-1: Substantial impairment of an adopted emergency response plan or emergency evacuation plan	S	PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan	LTS
Impact WF-2: Exacerbation of wildfire risks associated with pollutant concentrations or uncontrolled spread of wildfire	LTS	None required	LTS
Impact WF-3: Project-related installation or maintenance of associated infrastructure that may exacerbate fire risk or result in temporary or ongoing environmental impacts	LTS	None required	LTS
Impact WF-4: Exposure of people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, post-fire slope instability, or drainage changes	S	PEIR Mitigation Measure WQ-1: Comply with NPDES requirements	LTS

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Chapter 1
Introduction and Scope of Subsequent Environmental Impact Report

1.1 Project Overview

Mulqueeney Wind Energy, LLC (Mulqueeney Wind), a subsidiary of Brookfield Renewable, is proposing the Mulqueeney Ranch Wind Repowering Project (project or proposed project) on 29 privately owned parcels (project site) in the Altamont Pass Wind Resource Area (APWRA). The proposed project would entail the replacement of approximately 518 old generation wind turbines installed in the 1980s with up to 36 new wind turbines. The project would have a generating capacity of up to 80 megawatts (MW), using turbines rated between 2.2 and 4.2 MW per turbine. The project is proposed as an application for a Conditional Use Permit (CUP) (Alameda County Planning case PLN2019-00226), as permitted by the County Zoning Ordinance for the subject site, and is reviewed in this Subsequent Environmental Impact Report (SEIR) pursuant to the California Environmental Quality Act (CEQA) Guidelines, Section 15162, as a project “tiered" under the Altamont Pass Wind Resource Area Repowering Program EIR (PEIR), which the County of Alameda (County) certified in November 2014. Tiering is defined in the CEQA Guidelines (Section 15385) as the use of general or broad topic EIRs for use as general analysis for subsequent or narrower-scope or site-specific EIRs, in part to allow the lead agency to address general matters in an early stage ‘first-tier’ EIR and defer decisions on projects that are not yet ready for approval (not “ripe” for decision) to analysis in subsequent or supplemental EIRs or other CEQA documents.

1.2 Background

The APWRA was designated by the state of California as a wind resource area over large areas of Alameda and Contra Costa Counties during the late 1970s. The APWRA was developed with several thousand wind turbines by the mid-1990s and was operated by several different companies under various Conditional Use Permits (CUPs). In 1998, after many reports of birds being killed in blade strikes were documented, and research began to be developed on how repowering could reduce bird deaths and improve reliability, the two Counties cooperated in preparing a Program EIR and setting guidelines for future projects. Repowering is the replacement of older generation wind turbines with new turbines, technology, and infrastructure, with goals that include greater efficiency, reduced maintenance costs, and lowering avian mortality. However, for various reasons, only one repowering project was approved in Alameda County on the basis of the 1998 Program EIR, the Diablo Winds project, which began operating in 2005.

Most of the CUPs for the “wind farm” operations of older generation turbines in Alameda County were set to expire from 2001 to 2003. In 2005, the County extended use of those turbines through 2018 under 31 CUPs, with a requirement that phased repowering occur during the terms of the CUPs. The County also required preparation of the PEIR to evaluate the potential environmental impacts of such repowering and to identify appropriate mitigation measures to address significant impacts of repowering.

As required by the County's permit extensions in 2005, and pursuant to State CEQA Guidelines Section 15168, the PEIR was prepared, and it was certified on November 12, 2014. The PEIR represented a program-level evaluation of the planned repowering of the APWRA, with focused attention on two program alternatives of total buildout or complete repowering, either 417 MW (Alternative 1, based on the peak level of production capacity in Alameda County as of 1998, when repowering was first proposed and evaluated under the previous Program EIR) or 450 MW (Alternative 2, based on a modest increase of less than 10% in energy production over Alternative 1). The PEIR also incorporated project-level evaluation of two proposed repowering projects, the Golden Hills Wind Project proposed by NextEra Energy Resources and the Patterson Pass Project proposed by EDF Renewable Energy. Both of these projects were approved at the time the PEIR was certified. Separately, four other wind repowering projects were approved as consistent with and tiered under the PEIR since its original certification in 2014: 1) the Golden Hills North project approved for operation by NextEra Energy Resources; 2) the Summit Wind project approved for operation by Altamont Winds LLC; 3) the Rooney Ranch project approved by the City of Santa Clara (which has jurisdiction for that specific site) for operation by sPower (aka Sustainable Power, an AES and AIMCo company); and 4) the Sand Hill Wind project approved for operation by sPower (approved in February 2020 but final approval is pending an appeal hearing by the County Board of Supervisors). The proposed Mulqueeney Wind project was identified as a foreseeable project in the PEIR.

1.3 CEQA Guidelines Applicable to Tiering and Subsequent EIRs

State CEQA Guidelines Section 15152 provides guidance on the use of tiering for the analysis of general issues in a broad EIR with later environmental documents that address narrowly defined projects and which incorporate earlier analyses and discussion to focus on the unique issues particular to those subsequent projects. State CEQA Guidelines Section 15153 describes the procedure for using a single EIR for multiple or later projects, if the later project is essentially the same as the previously evaluated project in terms of environmental impacts. In the case of the Mulqueeney Wind project, however, as discussed further below, the project is not considered to be "essentially the same" as the projects evaluated in the 2014 PEIR. Instead, the County considers it as involving potential impacts on the environment for which a subsequent EIR is determined to be necessary. Section 15162 provides the following guidance on subsequent EIRs:

> **15162. SUBSEQUENT EIRS AND NEGATIVE DECLARATIONS**
>
> (a) When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:
>
>> (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
>>
>> (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

> (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
>
> > (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
> >
> > (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
> >
> > (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
> >
> > (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Section 15162(d) provides:

> (d) A subsequent EIR or subsequent negative declaration shall be given the same notice and public review as required under Section 15087 or Section 15072. A subsequent EIR or negative declaration shall state where the previous document is available and can be reviewed.

An EIR, including an SEIR, is a public informational document used in the planning and decision-making process. Although the EIR does not control the ultimate decision on the project, the lead agency must consider the information in the EIR and respond to each significant impact identified in the EIR.

1.4 Evaluation of Need for Subsequent EIR

Section 15168 of the State CEQA Guidelines provides for a Program EIR to be used for a series of actions that are characterized as one large project, related geographically, logically, or as individual activities carried out under the same authority with generally similar environmental effects that can be mitigated in similar ways. The overall repowering of the APWRA within Alameda County was, therefore, appropriately evaluated in the PEIR. State CEQA Guidelines Section 15168(b) lists the advantages of a Program EIR as allowing the lead agency to consider broad policy alternatives and program-wide mitigation measures at an early time, when the agency has greater flexibility to deal with basic problems or cumulative impacts. On this basis, the County is able to apply consistent and similar mitigation measures to each repowering project that may be proposed until repowering is considered complete. Additionally, Section 15152 of the State CEQA Guidelines describes the use and advantages of tiering, wherein the analysis of general matters contained in a broader EIR (including a Program EIR pursuant to Section 15152[h]) is used with later EIRs and negative declarations on projects, incorporating by reference the general discussions from the prior, broader EIR and concentrating the later CEQA analysis solely on the issues specific to the later project.

As set forth in Section 15168(d), a Program EIR can be used to simplify the task of preparing environmental documents on later parts of the program (such as a repowering project not evaluated at a project level in the PEIR), and to provide a basis within an Initial Study to determine if the later activity would have significant effects that were not recognized in the Program EIR. After the PEIR was certified in 2014, four wind repowering projects were evaluated at a project level with environmental checklists or an initial study, and approved as consistent with the PEIR: Golden Hills North, Summit Wind, Rooney Ranch, and Sand Hill Wind (the last of which was an earlier and different project iteration than was approved in February 2020 as noted above).

Although an environmental checklist was initially prepared for the Sand Hill Wind project in late 2018, the County chose in early 2019 to prepare a Subsequent EIR because of changes to the project characteristics as anticipated in the PEIR, such as the use of longer turbine rotor blades and up to 33 percent more MW yield per turbine, and potentially changed circumstances resulting from new information from monitoring study results that were available at the end of 2018. As noted above, the Sand Hill Wind project was approved in February 2020, although final approval (and the standing of its certified Subsequent EIR) is currently pending an appeal to the Alameda County Board of Supervisors.

In determining the appropriate type of document to prepare for the proposed project, the County considered lessons learned from implementation of the PEIR since its approval in 2014, including the environmental review process utilized for the Sand Hill Wind repowering project. After careful consideration of the current project's characteristics and currently available information, the County has determined that a decision to prepare this SEIR is warranted. The County took many aspects of the current project proposal and determinations in the PEIR into consideration in assessing the need for an SEIR, related to each of the conditions in Section 15162 of the CEQA Guidelines, as described below.

1. ***Changes in the Project:*** The proposed project would add 80 MW of capacity to the APWRA, consistent with the assumed capacity for Mulqueeney Ranch in the PEIR (Table 2-6 in the PEIR, p. 2-47). As shown in Table 2-6 in Chapter 2, *Project Description*, of this SEIR, however, while the rotor type, tower type, and total height specifications of the proposed project turbine types would be within the same range of comparable specifications described in the PEIR for typical turbines, the proposed nameplate capacity would be up to 40% greater (up to 4.2 MW versus 3.0 MW), blade lengths would be up to 5.5 meters (18 feet) longer (an increase of up to 9%), rotor diameters would be up to 11 meters (36 feet) greater (an increase of up to 9%), rotor-swept area would increase by up to 24,412 square feet (2,268 square meters) per turbine (an increase of up to 19%), and the height of the swept area above ground would be up to 19.5 meters (64 feet) lower than the typical turbines evaluated in the PEIR. Many avian researchers have concerns regarding increases in avian and bat mortality that may result from increased rotor-swept area and reduced rotor height (from ground to lowest tip of the blade).
2. ***Changes in Circumstances and/or New Information*:** The County evaluated several recent study results on avian and bat mortality, and in light of other projects tiered under the PEIR, acknowledges that there may be changes in circumstances and/or new information of potentially substantial importance that was not and could not have been known at the time the PEIR was completed. The PEIR was certified in 2014, and three years of monitoring have been completed for the Golden Hills Wind project. Golden Hills monitoring results are presented by H. T. Harvey & Associates (2020) in the *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Project: Final 3-Year Report* (Draft). The monitoring effort indicated higher mortality rates than those estimated in the PEIR, particularly for small birds and bats (see Section 3.4 of this SEIR). The first year of fatality monitoring is now available for the Golden Hills North project (Great Basin Bird Observatory and H.T. Harvey & Associates 2020). The Golden Hills North monitoring report documents higher mortality for small birds and bats compared to the PEIR. In addition, a third year of monitoring results for Vasco Winds is now available, showing higher mortality rates for golden eagles and bats, and lower mortality rates for burrowing owls

compared to the PEIR. These monitoring efforts employed different methods to improve fatality detection and thus provide critically important information to consider in determining potential avian and bat impacts for future repowering projects in the APRWA. More information regarding these monitoring results and how they are incorporated into the analysis is provided in Section 3.4, *Biological Resources*.

Commenters on the NOP and previous projects tiered under the PEIR have also specifically asked for more detailed cumulative impacts analyses on avian and bat fatalities from collision with wind turbines. The cumulative impacts analysis in this SEIR adopts a more numerical approach than was used in the PEIR, explicitly considering project effects, APWRA-wide effects, and APWRA-plus-MHWRA effects on bird and bat populations within study areas that are defined for each species assessed. Golden eagle populations are assessed within the Local Area Population as defined using USFWS (2013) guidance. Other bird populations are assessed within the local Bird Conservation Region, a geographic region used by USFWS and other authorities to track bird conservation efforts. Bat populations are assessed with reference to population status assessments in the peer-reviewed literature. The full analysis of these cumulative impacts is provided in Chapter 5, *Other CEQA Considerations*.

In summary, the County decided to prepare this SEIR based on the specific physical characteristics of this project, which would, as described above, include turbines with a larger RSA and with a shorter ground-to-rotor height than those analyzed in the PEIR, and therefore could potentially result in different or more severe impacts than identified in the PEIR. Those impacts are specifically analyzed in this SEIR. In addition, this SEIR takes into account new information generated from monitoring reports that document fatalities from repowered projects since the PEIR was prepared, and also provides a more detailed cumulative analysis on avian and bat mortality from collision with wind power facilities.

1.5 Scope of this Subsequent EIR

This SEIR is focused on differences in information and the specific distinctions of the project compared with the anticipated characteristics of repowering projects as described in the PEIR. Identifying the potential for new or different mitigation measures and alternatives to the project is among the primary objectives of this SEIR. In addition, this SEIR discusses some program-level issues that may apply to some future repowering projects. The PEIR provided for identification of specific impacts and appropriate mitigation for buildout of either of two generating capacity scenarios for the APWRA as potential PEIR outcomes using quantified land disturbance estimates for each of several different project aspects, and separately for two individual projects. However, this SEIR is fundamentally a project-level EIR and is only intended to assess the impacts of the project and to identify appropriate, applicable mitigation measures. However, to streamline analysis, CEQA documents for future wind energy projects that will tier from the PEIR may incorporate by reference the updated information provided herein.

Chapter 2, *Project Description*, provides updated information about repowering in the APWRA and provides context to aid in the analysis of the project, some of which may have consequences for other future projects. The following issues are discussed in Chapter 2.

- Wind Resource Area capacity.
- Changes in wind turbine technology.

- Latest science and monitoring results regarding avian and bat fatalities.
- Updated information on cumulative impacts to avian and bat species
- An updated raptor conservation mitigation measure.

1.6 Organization of this Subsequent EIR

This SEIR is organized in the following chapters.

- *Executive Summary* presents a brief summary of the project; summarizes the impacts and mitigation measures; identifies areas of known controversy, including issues raised by agencies and the public; and identifies unresolved issues. The *Executive Summary* also summarizes the proposed project's growth-inducing impacts, cumulative impacts, significant and unavoidable impacts, and significant irreversible impacts.
- Chapter 1, *Introduction*, explains the purpose of this SEIR, and discusses the environmental review process.
- Chapter 2, *Project Description*, describes the proposed project and updated information related to future projects that may be tiered under the PEIR.
- Chapter 3, *Impact Analysis*, consists of sections containing the environmental analysis for each environmental topic (e.g., aesthetics, air quality, noise). This chapter identifies project impacts and mitigation measures.
- Chapter 4, *Alternatives*, contains discussion of the project alternatives. As allowed by CEQA, most of the impacts of these alternatives are evaluated at a more general level than are the impacts of the proposed project.
- Chapter 5, *Other CEQA Considerations*, presents the analysis of the proposed project's growth-inducing impacts, cumulative impacts, and the identification of significant and irreversible, as well as significant and unavoidable environmental changes.
- Chapter 6, *Report Preparers*, lists the authors, the technical specialists and members of the production team, and other key individuals who assisted in the preparation and review of this SEIR.
- Appendix A, *Comments on the NOP*, provides the Notice of Preparation and scoping comments that were received in response.
- Appendix B, *Air Quality and GHG Modeling Assumptions*, provides information that was utilized in the air quality and greenhouse gas (GHG) models to estimate emissions for this project.
- Appendix C, *Biological Resources Report for the Mulqueeney Ranch Wind Repowering Project*, is a report prepared for the project that documents the occurrence and potential occurrence of various biological resources on the project site.
- Appendix D, *Avian Survey Report for the Mulqueeney Ranch Wind Repowering Project*, is a report prepared for the project that documents the occurrence and potential occurrence of various avian species on and near the project site.

- Appendix E, *Phase 1 Environmental Site Assessment*, identifies historical and current land use, operations and potential hazardous environmental conditions associated with the project site and surrounding area.
- Appendix F, *Micro-Siting Assessment*, assesses the potential risk to avian and bat species for each of the proposed turbines on the project site.
- Appendix G, *Supplemental Micro-Siting Assessment*, assesses the potential risk to avian and bat species for alternative turbine locations on the project site.
- Appendix H, Comments on the Draft Subsequent Environmental Impact Report and Responses to Comments, provides reproductions of annotated comment letters and responses to those comments.
- Appendix I, Mitigation Monitoring and Reporting Program, includes the Mitigation Monitoring and Reporting Program (MMRP) prepared for the project pursuant to CEQA Guidelines Section 15097.

1.7 Environmental Review Process

1.7.1 Notice of Preparation

The County distributed an NOP of a draft SEIR for the proposed project on April 6, 2020. The NOP was distributed for a 30-day comment period that ended on May 7, 2020. The NOP is provided in Appendix A. The County received comments on the NOP from: the Native American Heritage Commission (NAHC), the California Unions for Reliable Energy (CURE), the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), and the East Bay Regional Parks District (EBRPD). The comments on the NOP were considered in the preparation of this SEIR, and are also included in Appendix A.

CEQA does not require formal hearings at any stage of the environmental review process (State CEQA Guidelines 15202[a]). However, it does encourage "wide public involvement, formal and informal...in order to receive and evaluate public reactions to environmental issues" (State CEQA Guidelines 15201).

1.7.2 Public Review

CEQA requires the County (the lead agency) to prepare an EIR (including an SEIR) that reflects the independent judgment of the agency regarding the impacts, the level of significance of the impacts both before and after mitigation, and the mitigation measures proposed to reduce the impacts. A draft EIR is circulated to responsible agencies, trustee agencies with resources affected by the project, and interested agencies and individuals. The purposes of public and agency review of a draft EIR include sharing expertise, disclosing agency analyses, checking for accuracy, detecting omissions, discovering public concerns, and soliciting counterproposals.

Reviewers of a draft EIR should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate significant environmental effects.

This draft SEIR ~~is~~ was available for review and comment by the public, responsible agencies, organizations, and other interested parties for a ~~45~~ 60-day period. Comments ~~must be received either electronically or physically~~ were due to the County by 5 p.m. on the last day of the comment period~~. All~~ , January 8, 2021. The draft SEIR instructed that all comments or questions about the draft SEIR should be addressed to Andrew Young, Senior Planner, ATTN: Mulqueeney Ranch Repowering Project SEIR, Alameda County Planning Department, 224 W. Winton Avenue, Room 111, Hayward, CA, 94544, or via email with subject line "Mulqueeney Ranch Repowering Project SEIR" to: andrew.young@acgov.org. The County ~~will conduct~~ conducted a public hearing during a noticed East County Board of Zoning Adjustments meeting to present the conclusions of the draft SEIR and solicit comments on the document. ~~Unless otherwise indicated in the public notice, the hearing will be a virtual or~~ The hearing was held online ~~meeting~~ in a webinar format due to ~~current and anticipated~~ shelter-in-place health and safety guidelines. The hearing ~~will also provide~~ provided agencies and the public with opportunities to raise any questions or concerns about the adequacy of the draft SEIR in complying with CEQA. No comments on the draft SEIR were received at the hearing.

1.7.3 Final SEIR

Comments on ~~this~~ the draft SEIR received during the review period ~~will be~~ were used to prepare a final SEIR. The County will hold a public hearing before certifying the final SEIR, during which the public and agencies can provide additional comments.

Chapter 2
Project Description

2.1 Mulqueeney Ranch Wind Repowering Project

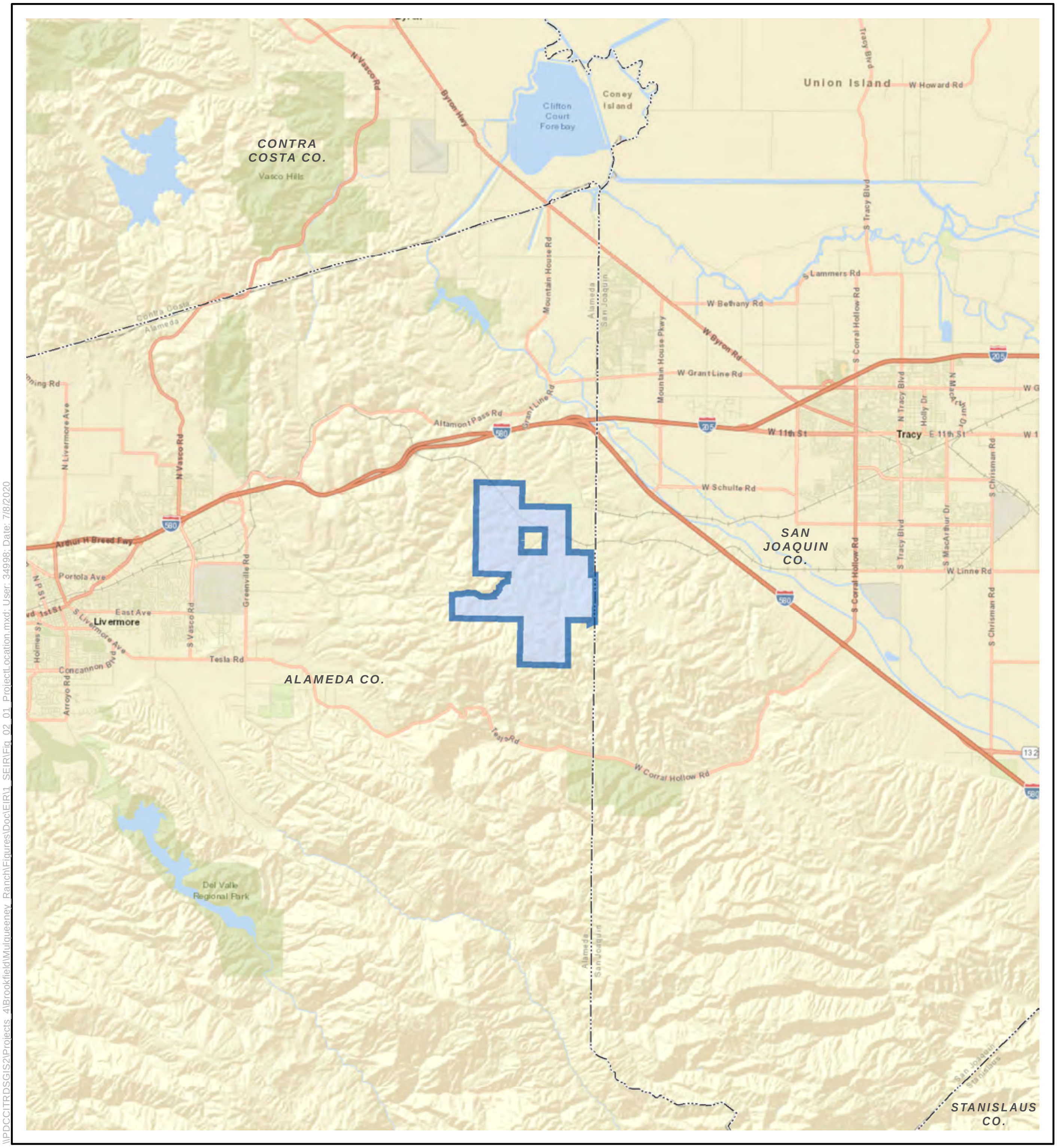
Mulqueeney Wind Energy, LLC (Mulqueeney Wind), a subsidiary of Brookfield Renewable (Brookfield), is proposing the Mulqueeney Ranch Wind Repowering Project (project or proposed project) on 29 privately owned parcels (project site) in the Altamont Pass Wind Resource Area (APWRA). The proposed project would entail the replacement of approximately 518 old generation wind turbines installed in the 1980s with up to 36 new wind turbines. This section describes the project site location, the characteristics of the proposed project, the project objectives, and the approvals that would be required for the proposed project. This section also briefly describes the Program Environmental Impact Report (PEIR) that was prepared for the planned repowering of the APWRA and certified in 2014, and the scope and purpose of this Subsequent EIR (SEIR) to the PEIR.

2.1.1 Project Location and Land Ownership

The project site is located in the southeastern quadrant of the Alameda County portion of the Altamont Pass area, north and south of Patterson Pass Road between 1 and 2 miles north of Tesla Road, and approximately one mile south of Interstate 580 (see Figure 2-1). The project site comprises 29 parcels extending over approximately 4,600 acres (see Table 2-1 and Figures 2-1 and 2-2) within the APWRA.

Table 2-1. Parcels in the Project Site

Assessor's Parcel Number	Acreage	Assessor's Parcel Number	Acreage
99A-1800-2-3	154.3	99B-7925-2-1	19.7
99A-1800-2-4	16.5	99B-7925-2-2	0.2
99B-7890-2-4	232.8	99B-7925-2-3	6.0
99B-7890-2-5	35.6	99B-7925-2-4	433.9
99B-7890-2-6	43.3	99B-7925-2-5	15.8
99B-7890-4	14.0	99B-7925-3	11.7
99B-7900-1-3	15.9	99B-7950-2	171.4
99B-7900-1-4	0.1	99B-7975-1	355.6
99B-7900-1-5	463.1	99B-7980-1	669.5
99B-7900-1-6	6.1	99B-7985-1-3	118.9
99B-7900-1-7	149.7	99B-7985-1-4	125.3
99B-7900-2	12.7	99B-7985-1-5	92.0
99B-7910-1-1	596.1	99B-7985-1-6	113.2
99B-7910-1-2	26.7	99B-8050-1	686.0
		99B-8100-1-1	2.7
		Total	**4,588.8**



Project Boundary

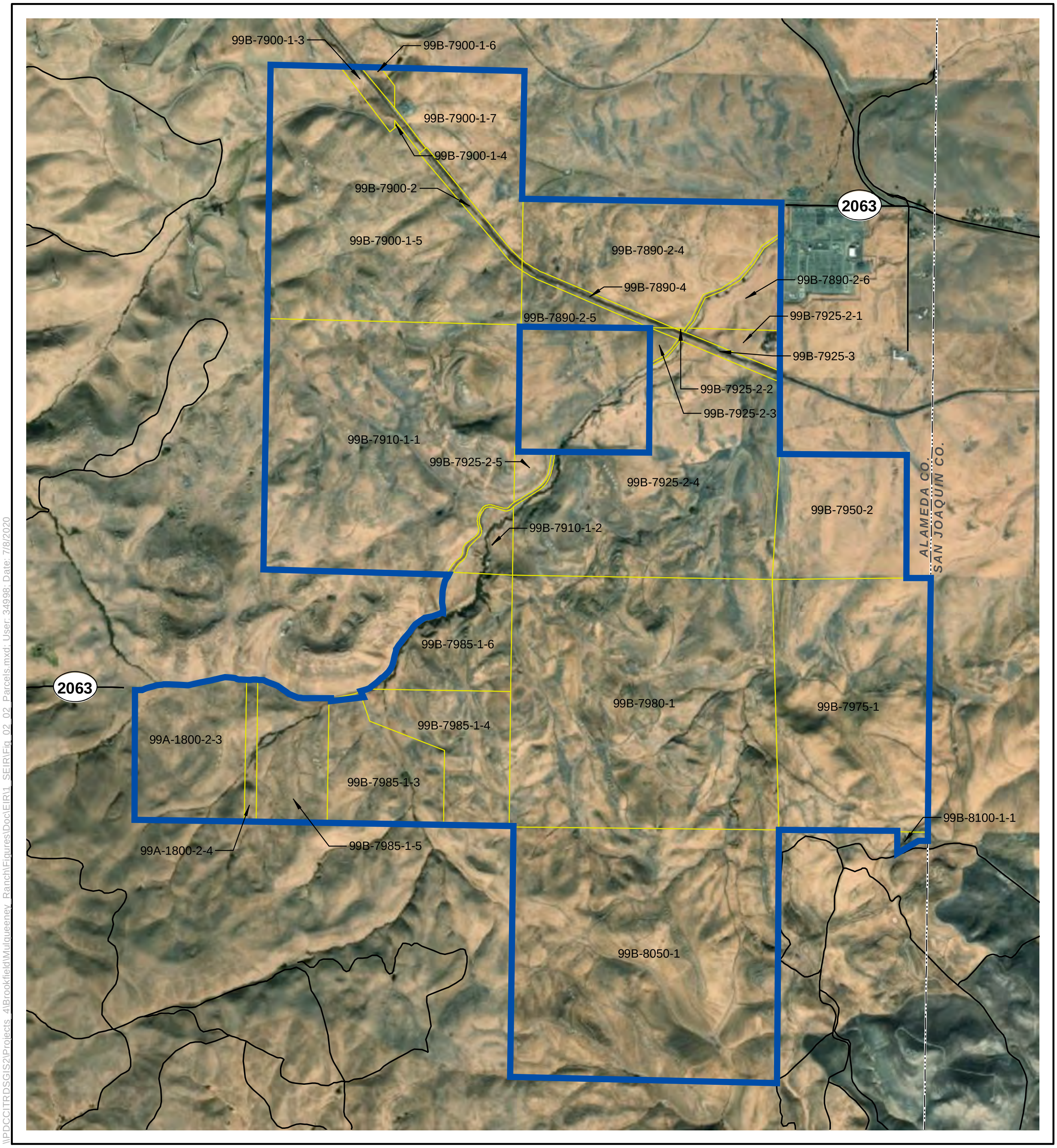
County Boundary

0 2 4 Miles

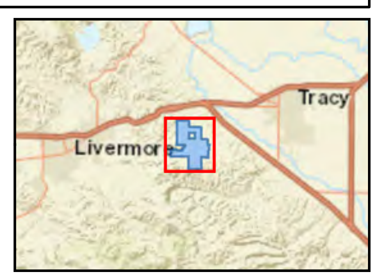
1:200,000

N

Figure 2-1
Project Location



Project Boundary
County Boundary
Local Road
Parcel Boundary



0 0.5 1 Miles
1:36,000

ICF

N

Figure 2-2
Parcel Boundaries

2.1.2 Existing Conditions and Land Uses

2.1.2.1 Altamont Pass Wind Resource Area

The APWRA is located in the Altamont Hills of eastern Alameda County near the San Joaquin County line, north and south of Interstate 580, and approximately 56 miles east of San Francisco. The Altamont Hills are at the geographical interface between the coastal mountains and the Central Valley (Figure 2-1). The boundaries of the program area have not changed since the certification of the PEIR.

2.1.2.2 Project Site Existing Conditions and Land Uses

Generally characterized by rolling foothills of annual grassland, the mostly treeless project site is steeper on the west and gradually flatter to the east where it slopes toward the floor of the Central Valley. Elevations on the project site range from less than 500 to more than 1,900 feet above sea level. Land use on the project site and the surrounding APWRA consists largely of cattle-grazed land supporting operating wind turbines and ancillary facilities. Many of the parcels on the project site were previously used for wind production, as described below. There is one residence within the project site, located south of the PG&E Tesla substation.

Mulqueeney Wind has a long-term easement agreement with the landowner to install, operate, and maintain repowered wind turbines while allowing ongoing agricultural activities (i.e., ranching operations) to continue.

Wind Turbines and Foundations

The project site was historically occupied by 518 old generation wind turbines installed primarily in the 1980s based on a series of conditional use permits (CUP) approved by the County. All old generation wind turbines and towers on the project site were decommissioned and removed in 2016. Wind turbine foundations (generally pier-type foundations) were also removed at that time.

Access Roads

Primary access to the project site is from Patterson Pass Road. The project site contains numerous access roads of various widths and maintenance states. The majority of the onsite roads were used to access the previous old generation wind turbines and most will remain in place for ongoing, routine ranching operations.

Meteorological Towers

The project site currently has five existing temporary meteorological towers: four 60-meter (197-foot) towers and one 100-meter (328-foot) tower. The meteorological towers were permitted by the County in August 2015 and installed by Mulqueeney Wind in 2016 to measure the speed and quantity of the wind resource in consideration for a later wind project application and turbine siting.

Power Collection System

The power collection system for the old generation wind turbines included overhead and underground lines. This system was decommissioned in 2016, at which time all aboveground facilities were removed. Several aboveground facilities (serving the adjacent Golden Hills project) are on the project site. These facilities connect a small electrical substation to the PG&E Tesla substation, which is located on the eastern boundary of the project site and encompasses approximately 15.6 acres.

Substations

A small electrical substation occupying approximately 1.5 acres is located in the northwest corner of the project site. This substation is owned (or used) by NextEra Energy Resources for the adjacent Golden Hills Project.

Transmission Lines

Several transmission lines of various sizes cross the project site. The transmission lines are owned by PG&E and consist of five 115 kilovolt (kV), one 230kV, and one 500kV lines.

Livestock Handling and Staging Areas

Several livestock handling and staging areas are located on the project site.

2.1.3 Project Need, Goals, and Objectives

The underlying purpose of the proposed project is to repower a segment of the PEIR program area with a commercially viable wind energy facility that would help meet the state's Renewables Portfolio Standard (RPS), greenhouse gas (GHG) reduction, and carbon neutrality goals.

The fundamental objective of the proposed project is as follows:

- To ~~site up to 36~~ install new wind turbines that will produce and deliver 80 megawatts (MW) of commercially viable wind energy to the electrical grid through a long-term power purchase agreement with a local community choice aggregator, using up to 36 wind turbines while using the least number of locations to achieve the production objective within the environmental and other regulatory and physical constraints of the project site.

The secondary objectives of the proposed project are as follows:

- To achieve the above fundamental objectives while avoiding and minimizing environmental impacts by:
  - Constructing the turbines and necessary infrastructure with the appropriate use of scientific observation to site turbines to avoid and minimize adverse effects and mortality of native plants, terrestrial species, bats and birds;
  - ~~Improving the understanding by the wind industry, regulators, and the scientific community of the effects of new generation turbines on birds and bats by applying~~ Operating an avian ~~mortality~~ fatality monitoring ~~protocol that is~~ program in accordance with the mitigation measures and survey protocols established in the APWRA Repowering Program EIR and based on the latest science and monitoring results to determine whether applicable thresholds are exceeded, and, if needed, implementing adaptive management measures to reduce fatalities of focal raptor species to levels below the thresholds established in the Program EIR; and

- Contributing financial and scientific resources to the conservation and enhancement of protected bird and bat species in the APWRA region, consistent with mitigation measures identified in the PEIR for repowering the APWRA.

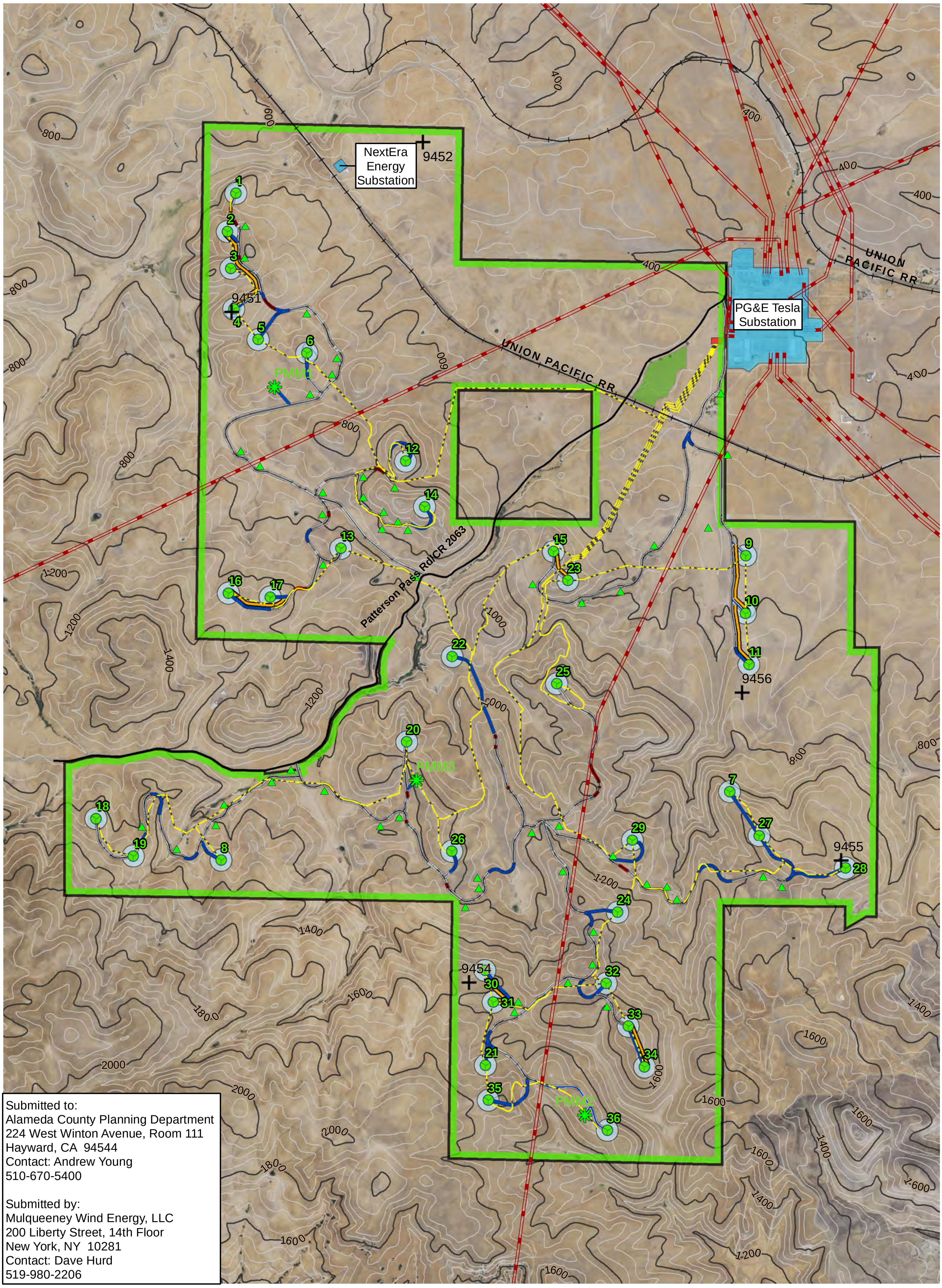
- To increase local short-term and long-term employment opportunities.
- To contribute to repowering of the APWRA and provide economic benefits to Alameda County.

2.1.4 Proposed Project Characteristics

The proposed project would entail the installation of up to 36 new wind turbines on the project site, replacing the 518 old generation wind turbines that were removed from the project site in 2016. The new turbines would have individual generating capacities between 2.2 and 4.2 MW and would have a combined maximum generating capacity of 80 MW. The exact turbine model is still being evaluated but would be selected based on project economics and energy cost driven by site constraints, data obtained from meteorological monitoring of the wind resources, civil and electrical construction costs and turbine availability as well as environmental considerations, bird use survey results, and avian micro-siting considerations. Existing roads would be used where possible, and temporary widening and some new roads would be necessary. The project would also require installation of underground electrical lines connecting the turbines to a new substation that would be constructed adjacent to PG&E's Tesla substation where the project would connect to the grid. Given the proximity of the project substation to the Tesla substation, construction of an overhead high-voltage transmission line will not be required except for a short span (less than 300 feet) between the two substations.

The proposed project components are listed below, illustrated in Figures 2-3 and 2-4, and discussed in greater detail in the following subsections.

- A total nameplate generation capacity of 80 MW.
- Installation of up to 36 new wind turbine generators, towers, foundations, and pad-mounted transformers.
- Development of project access roads (including the use of existing roads to the extent possible).
- Installation of a temporary construction staging area.
- Installation of up to three permanent meteorological towers.
- Installation of an underground power collection system.
- Construction of a new substation.



Project Boundary

Project Components

- Wind Turbine Generator
- Turbine Pad
- Proposed MET Mast
- Radius Improvement
- Crane Path
- Electrical Collection System
- Existing Access Road-Widen and Resurface
- Existing Access Road-Regrade and Widen
- New Access Road
- Proposed Project Substation
- Temporary Construction Facility

Existing Infrastructure

- Existing Temporary MET Mast (to be removed)
- Existing Transmission

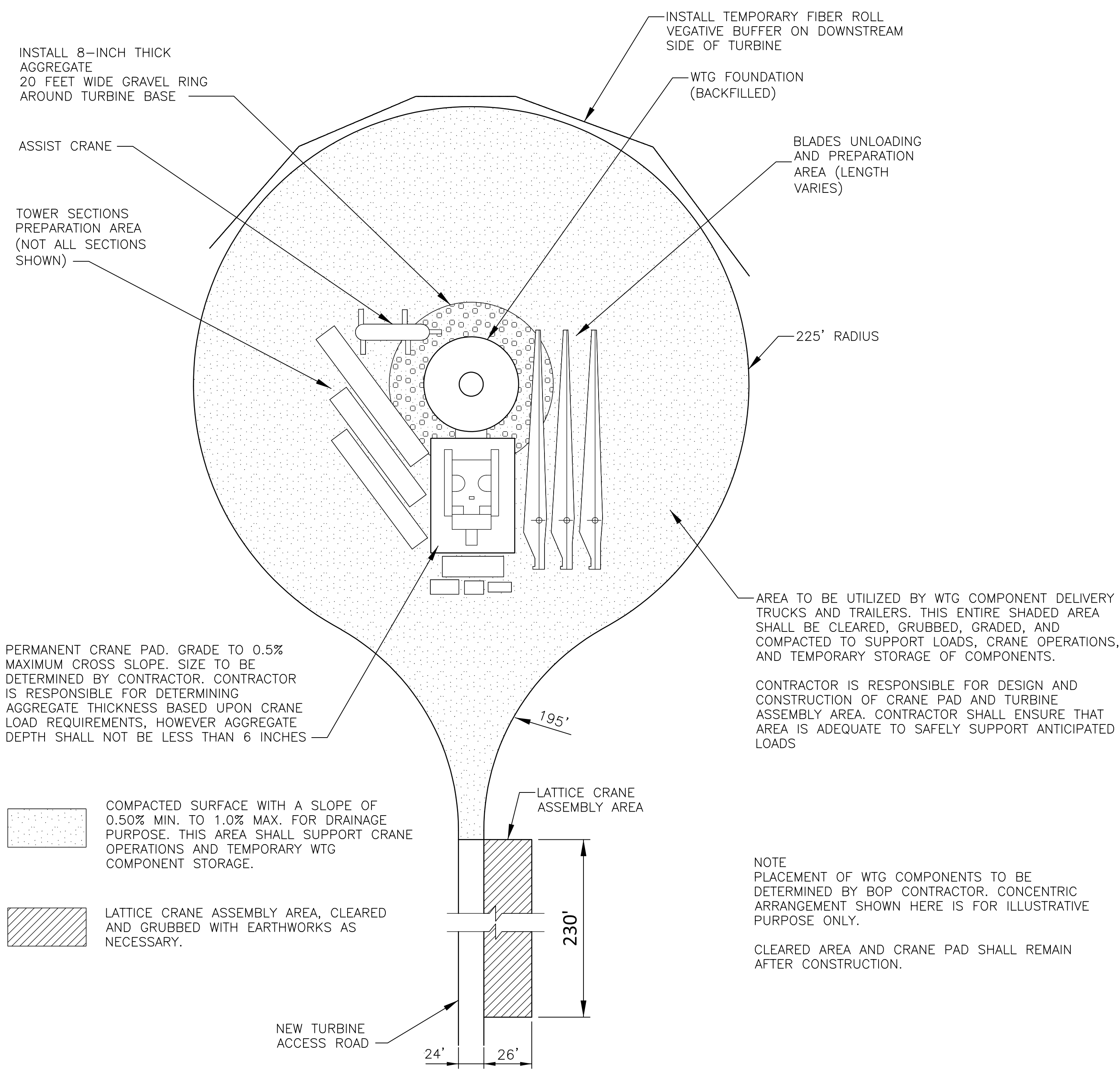
Project Layout, Black & Veatch, 10/15/2019
Contour Interval: 50 feet

N

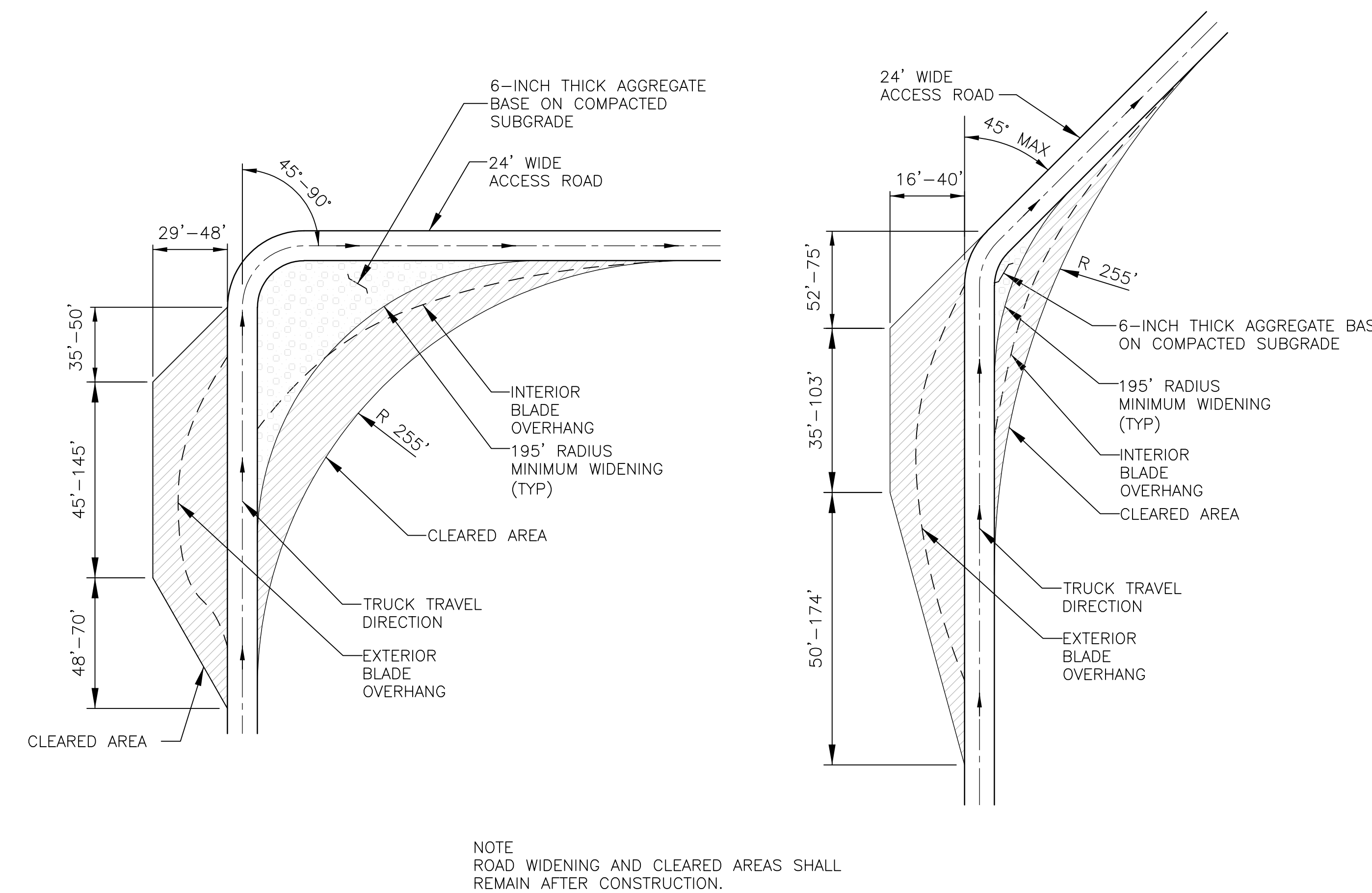
0 1,000 2,000 Feet

1:24,000

Figure 2-3
Mulqueeney Ranch Wind Repowering Project - Conceptual Plan



1
–
PROPOSED TURBINE CONSTRUCTION LAYOUT DETAIL
NO SCALE



2
–
HAUL ROAD WIDENING DETAIL
NO SCALE

Mulqueeney Wind farm
Vestas 2.2MW Layout
Brookfield Renewable
Preliminary, Subject to Change

BLACK & VEATCH
Building a world of difference.®

DETAILS

ICF

Figure 2-4
Construction Details

2.1.4.1 Wind Turbines

Wind Turbine Characteristics

Most of the turbines being repowered in the APWRA were installed during the 1980s and represent first- and second-generation utility-grade commercial wind turbine technology, now considered old technology. The terms *first-generation*, *second-generation*, *third-generation*, and *fourth-generation* are used to group wind turbine types with similar technologies currently installed or to be installed in the program area. In this context, first-generation wind turbines are those designed and installed during the 1980s. Second-generation turbines are those designed and installed during the 1990s. Third-generation turbines are those installed in previous repowering projects since 2000 that use similar design to turbines proposed for the project, but that are of smaller size (i.e., up to 1 MW) which are no longer being manufactured in most markets. Fourth-generation turbines, such as those proposed for installation as part of the project, are large, 1.6 to 5.0 MW turbines. Some ocean or sea-installed turbines are still larger, and still considered fourth-generation turbines. In terms of physical dimensions of land-based turbines, 500 feet tip-height is typically the upper limit in the United States with respect to Federal Aviation Administration (FAA) guidelines. Turbine heights of more than 500 feet must go through additional review and approval with the FAA. The turbines proposed by the project would be less than 500 feet tall.

The proposed project would entail installation of up to 36 fourth-generation turbines within the project site. Turbines being considered range in nameplate capacity from 2.2 to 4.2 MW, and have a rotor diameter of 120 to 136 meters (394 to 446 feet), tower height of 80 to 86 meters (262 to 282 feet), and a maximum total turbine height of 152 meters (499 feet). Table 2-2 below provides the specifications of the proposed turbines. The project layout assumes the use of 36 x 2.2 MW turbines.

Table 2-2. Turbine Specifications[a]

Turbine Characteristic	Range of Specifications
Rotor type	3-blade/horizontal axis
Blade Length	60–68 m (197–223 ft)
Rotor diameter	120–136 m (394–446 ft)
Rotor-swept area	11,310–14,527 m^2 (121,740–156,367 ft^2)
Rotational speed	Variable: 4.4–14.9 rpm
Tower type	Tubular
Tower (hub) height	80–86 m (262–282 ft)
Rotor height (from ground to lowest tip of blade)	20–25 m (66–82 ft)
Total height (from ground to top of blade)[b]	140–152 m (459–499 ft)

ft = feet; ft^2 = square feet; m = meters; m^2 = square meters; MW = megawatts; rpm = revolutions per minute.

[a] Turbine dimensions would not exceed the ranges shown in the table and the project capacity would not exceed 80 MW.

[b] Total turbine height would not exceed approximately 152 meters or 500 feet.

Siting Requirements

The applicant would adhere to the siting requirements of Alameda County to maintain consistency with regional planning that has been conducted to date, primarily through the preparation of the PEIR. Setback requirements were originally developed for Alameda County windfarms in the 1980s and 1990s in consideration of a variety of factors, such as appropriate distance between upwind and downwind turbines for effective wind production, noise effects on sensitive land uses, visual impacts resulting from proximity to residences and possible shadow flicker, concerns regarding tower collapse, and blade throw hazard (where all or part of a rotor blade may break loose from the nacelle and strike an occupied area or infrastructure). The County certified a Final Subsequent EIR for the Sand Hill Wind Repowering Project (Alameda County Community Development Agency 2020) which further refines and clarifies the County's setbacks. As noted in the Sand Hill Final Subsequent EIR, the changes and updates to the setback table are meant to more clearly indicate where supporting studies or agreements are required.

In order to provide more clarity, Table 2-8 in the Sand Hill Final Subsequent EIR, certified in February 2020, replaced and updated PEIR Table 2-2 to emphasize that two distinct setback options are available for the siting of each turbine relative to adjacent land uses or infrastructure corridors. These options included a Standard Minimum Setback for which there are no special conditions (referred to as the General Setback in Table 2-2 in the PEIR), and a Reduced Optional Setback that is conditional on the submittal and approval of notarized agreements and/or blade-throw studies (identified as the Alternative Minimum in Table 2-2). These changes to the terms of reference and other updates to the setback table were meant to more clearly indicate where supporting studies of blade throw, noise, or shadow flicker studies are required. The current setback requirements are shown in Table 2-3.

Table 2-3. Alameda County Turbine Setback Requirements

Affected Land Use or Corridor Type	Standard Minimum Setback, without Conditions	Reduced Optional Setback, with Conditions[a]		Setback Adjustment for Turbine Elevation above or below Affected Use[b]
		Distance	Conditional Requirement	
Adjacent parcel with approved or planned wind energy CUP[c]	1.1 times rotor length	0.55 times rotor length	Notarized agreement or easement	1% of TTH added or subtracted per 10 ft. of turbine elevation, respectively, above or below affected parcel
Adjacent parcel without approved wind energy CUP	1.25 times TTH	1.1 times rotor length	Notarized agreement or easement	1% TTH per 10 ft above or below affected parcel
Adjacent dwelling unit[d]	3 times TTH	1.5 times TTH	Notarized agree-ment or easement and Blade-Throw Study	1% TTH per 10 ft above or below affected unit
Public road (including Interstate 580, other highway, and passenger rail line right-of-way), trail, commercial or residential zoning	2.5 times TTH	1.25 times TTH	Blade-Throw Study	1% TTH per 10 ft above or below affected right-of-way or zone district
Recreation area (property boundary)	1.25 times TTH	1.0 times TTH	Blade-Throw Study	1% TTH per 10 ft above or below property line

Affected Land Use or Corridor Type	Standard Minimum Setback, without Conditions	Reduced Optional Setback, with Conditions[a]		Setback Adjustment for Turbine Elevation above or below Affected Use[b]
		Distance	Conditional Requirement	
Transmission line (center conductor line)	2 times TTH	1.0 times TTH	Blade-Throw Study	1% TTH per 10 ft above or below path of conductor line at ground level

TTH = total turbine height: the height to the top of the rotor at 12:00 position. Setback distance to be measured horizontally from center of tower at ground level without adjustment for slope; ft = feet; CUP = conditional use permit.

[a] Reduced Optional Setback is the minimum distance, proportionate to rotor length or TTH as indicated, that is required for turbines approved with a CUP, and which require, in addition to any adjustment for elevation (see last column), prior to approval of the building permit, either: a) a notarized agreement or recorded wind easement on the affected property, subject to Planning Director approval; or b) a Blade-Throw Study prepared by a qualified professional engineer, subject to approval by the Planning Director, who may request an independent third-party engineering consultant to review such Study and who may also refer the Study and third-party review to the Director of Public Works for a recommendation regarding the Study and/or review. In the case of a residential use that is less than 3 times TTH, both a notarized agreement or recorded wind easement, and a Blade-Throw study are required.

[b] Any setback based on TTH will be increased or reduced, respectively, based on whole 10-foot increments in the ground elevation of the turbine above or below an affected parcel, dwelling unit, road right-of-way, or transmission corridor conductor line. Any portion of a 10-foot increment in ground elevation will be disregarded (or rounded down to the nearest 10-foot interval).

[c] No setback from parcel lines is required within the same wind energy CUP boundary. Knowledge of planned or proposed wind energy CUPs on adjacent parcels to be based on best available information at the time the subject application is deemed complete. The validity or suitability of an adjacent property for a wind energy CUP will be determined by the Planning Director, who may request verification from the property owner.

[d] Any turbine located less than 500 meters (approximately 1,540 feet) in a generally east or west direction (within the solar declination of approximately 47°) from a residence shall be subject to an additional requirement for preparation of a shadow flicker analysis as required by Mitigation Measure AES-5, defined in detail in the PEIR. Distance to residence shall be to the nearest exterior wall of a residence, or if specified by the residence in the agreement or easement, to a 2-acre building envelope, subject to approval by the Planning Director.

Wind Turbine Foundations

The type of turbine foundation used depends on terrain, wind speeds, and wind turbine type. Any remaining previous foundations or infrastructure present above or below ground that conflict with the repowering project would be removed as part of the proposed project. The size of the concrete cylinder and pad for the proposed project is determined by wind turbine model and size and site-specific conditions (e.g., expected maximum wind speeds, soil characteristics). The foundation's weight must be sufficient to hold the wind turbine in place. Specific building plans, based on site-specific geotechnical and engineering requirements, would be submitted to the County Building Department prior to construction. The mostly likely foundation type used would be a gravity-type spread-footing foundation. The foundation would taper from the base upward to a pedestal of approximately 18 feet in diameter with a concrete top between 6 inches and 1.7 feet above the finished grade. The wind turbine would be bolted to the center of the pedestal. Each foundation would contain steel reinforcement, and the concrete volume of each foundation is expected to be between 450 and 800 cubic yards. Each of the turbine models proposed would require a similarly sized foundation and similar engineering requirements. A small graveled area approximately 20 feet wide would encircle each foundation to facilitate maintenance access. The total diameter of the final footprint for each turbine, including the graveled area, would be approximately 58 feet.

Safety Lighting

Lighting of the wind farm would be in compliance with the FAA Obstruction Marking and Lighting Advisory Circular (AC70/7460-1L). Nighttime safety lighting would consist of FAA L-864 aviation red obstruction lights, which would be placed as high as possible on the turbine nacelle to be visible from any direction. Compliance with the FAA AC70/7460-1L requires lighting of each individual wind turbine. Intensity of the lights would be based on a level of ambient light, with illumination below 2 foot-candles being normal for the night and illumination of above 5 foot-candles being the standard for daytime.

Lightning Protection

Lightning protection would be incorporated as a standard element of the turbine design. The system would incorporate lightning receptors (including at the outermost blade tip and the blade root surface) and diverter strips in the blades that provide a path for the lightning strike to follow to the grounded tower. The system control and data acquisition system would document all critical lightning events and, if a problem is detected, the turbine would shut down automatically and be inspected to assure that damage has not occurred.

2.1.4.2 Access Roads

Primary access to the project site would be off Patterson Pass Road. Three access points are proposed: one to access the turbines located north of Patterson Pass Road, and two to access turbines located to the south of this road. Areas of Patterson Pass Road that may need to be improved have been identified. The transportation plan for construction would be prepared after the final turbine site plan is adopted by Brookfield, consistent with prior repowering projects. Roadway improvements required would be based on the final transportation route, such as improvements to the project site entrances if required to accommodate the turning radii of equipment. These activities would be subject to County encroachment permits as appropriate.

Fourth-generation turbine towers and blades, such as those for the proposed project, are significantly longer than older turbine components and require larger and longer trucks and cranes for transport and installation. These vehicles require wider roads with shallower turns and gradients than are currently present within the project site. Consequently, the existing project site road infrastructure must be upgraded to accommodate construction of the turbines. Road infrastructure upgrades would include grading, widening, and resurfacing some of the existing roads on the project site, and some sections of new road would be constructed where no roads currently exist. Existing road widths vary from approximately 12 to 20 feet; the proposed roads are expected to be approximately 24 feet wide. A portion of the existing roads would require modifications and grading work, specifically where the road gradient exceeds 13% and where inside turning radii are less than 195 feet, to accommodate turbine component deliveries.

The existing onsite drainage pattern would be maintained. Drainage would sheet flow along the sides of roads. Existing culverts would be inspected and replaced if necessary to accommodate the wider roads and other grading work. Existing culverts may need to be replaced with larger culverts or reinforced to provide adequate size and strength for construction vehicles.

2.1.4.3 Meteorological Towers

The five existing temporary towers on the project site would continue to operate until project construction, at which point they would be disassembled and removed consistent with the terms of the CUP. The proposed project would include construction of up to three new permanent meteorological towers, as shown in Figure 2-3. The towers would be free-standing, placed on small concrete foundations up to 80 meters tall. The meteorological towers would be used for power performance tests and forecasting during wind farm operation as required by the California Independent System Operator (CAISO). The towers would be reached by small access roads and would be surrounded by small graveled areas to facilitate maintenance access.

2.1.4.4 Power Collection System

Each new wind turbine must be connected to the medium-voltage electrical collection system via an individual step-up transformer. Depending on turbine choice, the step-up transformer can be mounted on a pad adjacent to the base of the turbine (i.e., padmount) or located directly in the nacelle. The collection system carries electricity generated by the turbines to a substation, where the voltage level of the collection system is stepped up to that of the power grid. From the substation, electricity is carried through an interconnection point to the transmission lines that distribute electricity to the power grid. From the project substation, electricity would be carried through a short (i.e., less than 300-foot) overhead line connected to the PG&E Tesla substation, where the electricity would be distributed to the power grid. Each of the collection system components is discussed below.

Collection Lines

Medium-voltage collection lines would collect power from each turbine for conveyance to the substation. Medium-voltage lines are normally up to 35kV. The new medium-voltage collection lines would be installed underground (see Figure 2-3).

In most cases, the medium-voltage lines would be installed using the cut-and-cover method. A disturbance width of 20 feet is generally standard to allow for the trench excavation and equipment, but this width may vary depending on the topography and soil type. Typically, the topsoil is separated from the subsurface soil for later replacement. A 3-foot-wide trench is then plowed using a special bulldozer attachment that buries the line in the same pass in which it digs the trench. Once the collection lines are in place, the trench is partially backfilled with subsurface soil. Typically, communication lines are then placed in the trench. The trench is then backfilled with the remaining subsurface soil, compacted, and covered with the reserved topsoil. To minimize surface disturbance within wetlands and streams, collection lines may be installed under wetlands and other waters using horizontal directional drilling (HDD) techniques, where feasible. HDD involves the use of a steered drilling head, which allows the bore machine to sit at ground level, bore down along on the collection line route, and direct the bore back up to the surface at a distant point. The bore machine uses a drilling fluid in the process, typically a mixture of fine clay (such as bentonite) and fresh water. The clay and water mixture coats the wall of the borehole to help hold it open and to provide lubrication for the drill stem and conduit being installed. Excess drilling fluid is typically captured using a vacuum truck. If HDD is used for aquatic resource avoidance, the project would be required to prepare and implement an Inadvertent Release Contingency Plan to address response and clean-up in the event that an inadvertent release occurs during HDD boring. Implementation of an Inadvertent Release Contingency Plan is a standard requirement when HDD is used. The Inadvertent

Release Contingency Plan would describe measures to minimize the potential for inadvertent release of drilling fluids associated with HDD activities, provide for the timely detection of inadvertent releases should they occur, and include measures to contain and clean up releases.

Collection lines would terminate adjacent to the substation, at which point they would rise onto one to two poles for the aboveground connection to the substation. Overhead poles would be designed in compliance with the latest recommendations of the Avian Power Line Interaction Committee. Other than the short connection to the Tesla substation, the project would not require any high-voltage overhead transmission lines.

Transformers

Transformers boost the voltage of the electricity produced by the turbines to the voltage of the collection system. Each turbine would have its own transformer adjacent to or within the turbine, either mounted on a small pad adjacent to the turbine or within the tower.

Substation

The project would require construction of a new substation immediately adjacent to the PG&E Tesla substation. The new substation would be connected via an intermediate structure (a single 130- to 150-foot pole) that would be installed outside the Mulqueeney substation. A single span from the new pole into an open bay inside the Tesla Substation would complete the connection. The main functions of a project substation are to step up the voltage from the turbine collection lines to the transmission level (230kV) and to provide fault protection. The basic elements of the substation facilities would be a single main power transformer, a single outgoing high side circuit, and four medium voltage collection circuits. The substation would also include a control enclosure for all protective relaying and Supervisory Control and Data Acquisition equipment. The main outdoor electrical equipment and control enclosure are installed on a concrete foundation, and the remaining area is typically compacted and graveled. The entire facility would be fenced with 12-foot-high chain-link security fencing. The facility would be monitored remotely. Nighttime security lighting at the substation would include motion sensors and would be directed downward. The fenced footprint for the substation would occupy approximately 1.0 acre.

2.1.4.5 Operations and Maintenance Facility

Mulqueeney Wind is not proposing to construct an operations and maintenance (O&M) facility for the project. Existing commercial building space, to facilitate O&M, would be leased in nearby Tracy or Livermore for this purpose.

2.1.4.6 Project Construction

Temporary and Permanently Disturbed Land

Disturbance areas associated with project construction were calculated by estimating disturbance associated with the proposed layout and are presented in Table 2-4.

Table 2-4. Estimated Disturbance Associated with Project Construction (acres)

Project Component/Activity	Permanent Impacts	Temporary Impacts
Wind turbines (including crane pads/foundations)	1.98	106.26
Access roads[a]	20.74	85.56
Road radius improvements	2.56	5.04
Crane paths	0.0	14.88
Temporary construction staging area	0.0	15.19
Meteorological towers	0.06	1.5
Power collection system	0.0	33.33
Substation	0.68	1.92
Total	**26.02**	**263.68**

[a] Existing access roads would be reused to the extent possible; however, some sections of new access road would be required. Estimates exclude the area of existing roads. Numbers may not sum precisely due to rounding.

Construction Schedule

Construction activities are expected to commence in 2021 after all construction-related permits are issued. Project construction would take place over 7 months. Construction activities would occur between 7:00 a.m. and 7:00 p.m. Monday through Friday and between 8:00 a.m. and 5:00 p.m. on Saturdays and Sundays.

Construction Equipment

Typical construction equipment used for wind farm facilities, as outlined in Table 2-5, is expected to be used for construction activities.

Table 2-5. Typical Wind Farm Facility Construction Equipment

Equipment Type	Project Use	Duration of Use[a]
1-ton crew cab 4x4	All aspects of onsite project construction except restoration and clean-up and turbine delivery	5 months
Grader	All aspects of onsite project construction except utility line installation and turbine delivery	7 months
Track type dozer	Road and pad compaction	4 months
Drum type compactor	Compaction, erosion, and dust control	4 months
Water truck	Dust control	5 months
Lowboy/truck/trailer/flatbed trucks	Off-loading towers and turbines and other materials	6 months
Backhoe/front loader	Move and carry soils and other construction debris/equipment	5 months
Excavator	Pad construction	7 months
Rock crusher	Road and pad construction	4 months
Trencher	Collection line installation	4 months
Cement trucks	Pad construction	3 months
Crane	Off-loading and erecting towers and turbines	4 months
Horizontal directional drilling bore machine	Collection line installation	2 months
Light duty trucks	All aspects of construction, delivery of personnel	7 months
Heavy duty trucks (including dump trucks)	Delivery of equipment and materials	7 months

[a] The duration of use for individual equipment would vary throughout the project. Total cumulative estimates of equipment usage are provided.

Workforce

Based on data provided for typical wind energy projects of similar size, an average of 50 workers would be employed during construction, with a peak workforce of 100 workers. Craft workers would include millwrights, iron workers, electricians, equipment operators, carpenters, laborers, and truck drivers. Local construction contractors and suppliers would be used to the extent possible.

Construction Sequence

Typical construction steps are listed below.

- Demarcation of construction areas and any sensitive biological, cultural, or other resources needing protection.
- Construction of temporary construction staging areas.
- Road infrastructure upgrades.
- Erosion and sediment control.

- Wind turbine construction.
  - Final site preparation and turbine pad grading.
  - Crane pad construction.
  - Foundation excavation and construction.
  - Tower assembly.
  - Installation of nacelle and rotor.
- Power collection system and communication line installation.
- Permanent meteorological tower installation.
- Final cleanup and restoration.

The construction contractors would prepare the project site, deliver and install the project components, oversee construction, and complete final cleanup and restoration of the construction sites. The proposed project would implement best management practices (BMPs) consistent with standard practice and with the requirements of the PEIR as well as any state or federal permits to minimize soil erosion, sedimentation of drainages downslope of the project site, and any other environmental impacts. The construction activities and the approximate duration of each are listed below (some activities would overlap chronologically).

- Preparation of temporary construction staging areas: 2 months.
- Road construction: 3 months.
- Construction of foundations and electrical work: 3 months.
- Turbine delivery and installation: 4 months.
- Electrical trenching and substation: 4 months.
- Cleanup: 4 months.

Demarcation of Sensitive Receptors

Sensitive resources in and adjacent to construction areas would be marked to ensure adequate avoidance. Sensitive areas identified through the environmental approval and permitting processes would be staked and flagged. Prior to construction, the construction contractor and any subcontractors would conduct a walk-through of areas to be affected, or potentially affected, by construction activities. The preconstruction walk-throughs would be conducted regularly to identify sensitive resources to be avoided, limits of clearing, location of drainage features, and the layout for sedimentation and erosion control measures. Following identification of these features, specific construction measures would be reviewed, and any modifications to construction methods or locations would be agreed upon before construction could begin.

Temporary Construction Staging Areas

A single temporary construction staging area would be used for construction trailers, employee parking, laydown, staging, and storage of materials, and potentially for a mobile concrete batch plant. The temporary construction staging area, east of Patterson Pass Road near the proposed substation and adjacent to the PG&E Tesla substation, would encompass approximately 15.6 acres (see Figure 2-3). Turbine components would be delivered directly to turbine pads and would not be stored at the temporary construction staging area. Mobile construction trailers would be used to support workforce needs and site security and would also house a first aid station, emergency shelter, and storage areas for the construction workforce. Parking areas would be located near the trailers. A mobile concrete batch plant may be utilized onsite to accommodate the large pour volumes. The batch plant would encompass approximately 2.5 acres for operation within the temporary construction staging area.

Vegetation would be cleared within the temporary construction staging area, which would be graded level or mostly level. The surface of the temporary construction staging area would use native material, supplemented with gravel or soil stabilizer, if needed, and appropriate erosion control devices (e.g., earth berm, silt fences, straw bales) would be installed to manage water runoff. Following completion of construction activities, the contractor would reclaim and restore the temporary construction staging area. The gravel surface would be removed, and the area would be contour graded (if necessary and if environmentally beneficial) to conform with the natural topography. Stockpiled topsoil would be replaced, and the area would be stabilized and reseeded with an appropriate seed mixture.

Turbine Construction and Installation

Turbines would be delivered to the site from the Port of Stockton or other nearby port or rail transfer locations. Repowered turbine construction entails placement of a foundation, new tower, rotor, nacelle, and transformer. Construction and installation of repowered turbines is regulated by County conditions of approval, building permit requirements, and grading permit requirements.

Tower assembly usually requires the use of one large track-mounted crane and two small cranes. The turbine towers, nacelles, and rotor blades would be delivered to each turbine pad and unloaded by crane. A large track-mounted crane would be used to hoist the base tower section vertically and then lower it over the threaded foundation bolts. The large crane would then raise each additional tower section to be bolted through the attached flanges to the tower section below. The crane then would raise the nacelle, rotor hub, and blades to be installed atop the tower. Two smaller wheeled cranes would be used to offload turbine components from trucks and to assist in the precise alignment of the tower sections.

At each turbine site, a level turbine pad would be graded to support the construction of tower foundations and to support the use of cranes to lift the turbine components into place. The extent and shape of grading at each turbine site would depend on local topography; however, each site would require approximately 2.0 acres of graded area to support the construction of foundations and installation of turbines. A crane pad would be leveled and graded within each turbine pad. The crane pad—a flat, level, and compacted area—would provide the base from which the crane would work to place the turbine. Wind turbine construction activities would take place within the turbine pad. Following construction, the turbine pad would be reclaimed; however, the crane pad would remain in place.

Construction and installation of turbines is regulated by the County's conditions of approval, building permit requirements, and grading permit requirements. The turbine towers, nacelles, and blades would be delivered to each turbine location in the order of assembly, once the concrete of the foundation has been poured and has cured sufficiently. Large cranes would be brought to each site to lift and assemble the turbine components. First, the base section of the tower would be secured to the foundation using large bolts. The remaining tower sections would then be lifted with the crane and connected to the base section. After the nacelle and rotor are delivered to the turbine site, the turbine blades would be bolted to the rotor hub, and the nacelle and rotor would be lifted by a crane and connected to the main shaft.

Excess rock generated by foundation construction would be spread on existing roads and maintenance areas surrounding the turbines. Old foundations from the previous wind project onsite may be removed if they are within proposed construction areas, if removal is necessary for the installation of new turbines, or to comply with landowner agreements or County requirements; such removals would involve workers demolishing the foundations using jackhammers or similar tools. The material from old turbine foundations may be reused for road base or hauled offsite to the Altamont Landfill, subject to the County's Green Building Ordinance.

Power Collection System and Communication Lines Installation

As described previously, some power lines would be installed underground. Installation of underground medium-voltage lines is accomplished in most cases using a cut-and-cover construction method. A disturbance width of 20 feet is planned to allow for the trench excavation and equipment, but this width may vary depending on the topography and soil type. Typically, the topsoil is separated from the subsurface soil for later replacement. A 3-foot-wide trench is then plowed using a special bulldozer attachment that buries the line in the same pass in which it digs the trench. Once the power collection lines are in place in the trench, the trench is partially backfilled with subsurface soil. Typically, communication lines are then placed in the trench. The trench is then backfilled with the remaining subsurface soil, compacted, and covered with the reserved topsoil. Transformers would be installed at each turbine, either mounted on a small pad adjacent to the turbine or within the tower.

Stormwater and Erosion Control

Because the project would disturb more than 1 acre, it would require coverage under the state's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2010-0014-DWQ) (Construction General Permit). Permit coverage would be obtained by submitting permit registration documents (PRDs) to the State Water Resources Control Board through its Stormwater Multiple Application and Report Tracking System website. The PRDs include a notice of intent, site maps, a stormwater pollution prevention plan (SWPPP), a risk level assessment, and other materials. The SWPPP would include the elements described in Section A of the Construction General Permit and maps that show the location and type of erosion control, sediment control, and non-stormwater BMPs, all of which are intended to prevent significant water quality impacts on receiving waters. The SWPPP would also describe site inspection, monitoring, and BMP maintenance procedures and schedules.

Erosion control measures would be implemented, including the use of straw wattles, silt fences/straw bale dikes, and straw bales to minimize erosion and collect sediment (to protect wildlife, no monofilament-covered sediment control measures would be used). Additional examples of erosion control measures that may be implemented include:

- Reseeding and restoration of the site.
- Maintenance of erosion control measures.
- Regular inspection and maintenance of erosion control measures.

Water and Wastewater Needs

Water for construction activities would be provided through an agreement with municipal or private suppliers. Temporary onsite water tanks and water trucks would be made available for fire water support, dust suppression, and construction needs. Daily water use would vary, depending on the weather conditions and time of year, both of which affect the need for dust control. Hot, dry, windy conditions would necessitate greater amounts of water. Tanker trucks would apply water to construction areas where needed to aid in road compaction and reduce construction-generated dust.

A minimal amount of water would be required for construction worker needs (e.g., drinking water, sanitation facilities). This water would be trucked in or delivered as bottled drinking water. A local sanitation company would provide and maintain appropriate construction sanitation facilities. Portable toilets would be placed at each of the temporary construction staging areas. When necessary, additional facilities would be placed at specific construction locations. Appropriate BMP training would be provided to truck operators to prevent runoff from dust suppression and control activities. Water used for cement mixing and truck washing would be managed in accordance with applicable permit conditions (and BMPs).

Hazardous Materials Storage

Hazardous materials (e.g., fuel, lubricants, other oils) would be stored at the temporary construction staging areas. The use of extremely hazardous materials is not anticipated. To minimize the potential for harmful releases of hazardous materials through spills or contaminated runoff, these substances would be stored within secondary containment areas in accordance with federal, state, and local requirements and permit conditions. Storage facilities for petroleum products would be constructed, operated, and maintained in accordance with the Spill Prevention Control and Countermeasures (SPCC) Plan that would be prepared and implemented for the proposed project (Title 40 Code of Federal Regulations Part 112). The SPCC Plan would specify engineering standards (e.g., secondary containment); administrative standards (e.g., training with special emphasis on spill prevention, standard operating procedures, inspections); and BMPs.

Inspection and Startup Testing

Prior to operation, each completed turbine would be inspected and checked for mechanical, electrical, and control functions in accordance with the manufacturer's specifications before being released for startup testing. A series of startup procedures would then be performed by the manufacturer's technicians. Electrical tests on the transformers, underground power lines, and collector substations would be performed by qualified engineers, electricians, and test personnel to ensure that electrical equipment is operating within tolerances and that the equipment has been installed in accordance with design specifications. The aboveground power lines interconnecting the project substation to the PG&E system would be tested and inspected as required.

Final Cleanup and Restoration

Clearing and disposing of trash, debris, and scrub from construction sites would be performed at the end of each workday through all stages of construction. Existing vegetation would be cleared only where necessary. All excavations would be backfilled with compacted earth and aggregate as soon as cable infrastructure is tested. Disposal of cuttings and debris would be in an approved facility designed to handle the waste.

Before construction is complete, all remaining trash and debris would be removed from the site. Any debris would be properly disposed offsite consistent with local, state, and federation restoration requirements as described in a Reclamation/Restoration Plan, which would be developed prior to construction as part of the construction planning and permitting process. Any material placed in the areas of the foundations or roads would be compacted as required for soil stability.

Construction Traffic and Parking

Construction traffic routing would be established in a Construction Traffic Plan, which would include a traffic safety and signing plan prepared by Mulqueeney Wind in coordination with the County and other relevant agencies. The plan would define hours, routes, and safety and management requirements.

This plan would incorporate measures such as informational signs, traffic cones, and flashing lights to identify any necessary changes in temporary roadway configuration. Flaggers with two-way radios would be used to control construction traffic and reduce the potential for accidents along roads. Speed limits would be set commensurate with road type, traffic volume, vehicle type, and site-specific conditions to ensure safe and efficient traffic flow. Onsite construction traffic would be restricted to the roads developed for the proposed project. Use of existing unimproved roads would be restricted to emergency situations.

During construction, oversized vehicles would deliver wind turbine generator and substation materials, heavy equipment, and other construction-related materials. Construction of the proposed project components (roads, turbines, substation, and electrical and communication lines) would take place concurrently, using individual vehicles for multiple tasks. There would also be daily round trips of vehicles transporting construction personnel to the site.

Construction-related parking would be at the temporary construction staging areas. Carpooling would be used whenever possible.

Construction Safety and Environmental Compliance Programs

Orientation of construction staff would include education on the potential environmental impacts of project construction. The construction manager would establish procedures for staff to formally report any issues associated with the environmental impacts, to keep management informed, and to facilitate rapid response.

Mulqueeney and its construction contractors and subcontractors would also be responsible for construction health and safety issues. The contractor would provide a health and safety (H&S) coordinator, who would ensure that applicable laws, regulations, ordinances, and standards concerning health and safety are followed and that any identified deficiencies are corrected as quickly as possible. The H&S coordinator would conduct onsite orientation and safety training for contract and subcontract employees and would report back to the onsite construction manager. Upon identification of a health and safety issue, the H&S coordinator would work with the construction manager and responsible subcontractor or direct hire workers to correct the violation.

A QA/QC program would be implemented by the applicant to ensure that construction and startup of the facility are completed as approved. Mulqueeney would be responsible for ensuring implementation of the QA/QC program prior to construction. The program would specify implementing and maintaining QA/QC procedures, environmental compliance programs and procedures, and health and safety compliance programs and procedures, and would integrate activities with by all parties during project construction. The engineering procurement and construction contractor and turbine supplier would be responsible for enforcing compliance with the construction procedures program for all of their subcontractors.

2.1.4.7 Project Operation

Operation and Maintenance Activities

Maintenance of turbines and associated infrastructure includes a wide variety of activities. Routine maintenance involves activities such as checking torque on tower bolts and anchors; checking for cracks and other signs of stress on the turbine mainframe 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 are conducted in and around the tower and the nacelle. Cleanup from routine maintenance activities would be conducted at the time maintenance is performed by O&M personnel. While performing most routine maintenance activities, O&M staff would travel by pickup or other light-duty trucks. In addition, nonroutine maintenance such as repair or replacement of rotors or other major components could be necessary. Such maintenance would involve use of one or more cranes and equipment transport vehicles. Existing commercial building space to facilitate O&M would be leased in nearby Tracy or Livermore.

Monitoring of project operations would be computer-based; computers in the base of each turbine tower would be connected to the O&M facility through fiber-optic or wireless telecommunication links.

The O&M workforce would be comprised of six to eight employees consisting of turbine technicians, operations personnel, administrative personnel, and management staff. O&M staff would monitor turbine and system operation, perform routine maintenance, shut down and restart turbines when necessary, and provide security. All O&M staff would be trained regularly to observe BMPs.

Operational Safety and Environmental Compliance Programs

Emergency Situations

The turbines would be equipped with internal protective control mechanisms to safely shut them down in the event of a high-voltage grid outage or a turbine failure due to electrical or mechanical problems. A separate low-voltage distribution service feed might be connected to the low-voltage side of the project substation as a backup system to provide auxiliary power to project facilities in case of outages. For safety, the project substation would be fenced, locked, and properly signed to prevent access to high-voltage equipment. Safety signage would be posted around turbines, transformers, and other high-voltage facilities and along roads, as required.

Public Access and Security

The project would be located entirely on properties with restricted public access. Only authorized access to the project site would be allowed. The site is fenced and the collector substation would be fenced with an additional 12-foot-high chain-link fence to prevent public and wildlife access to high-voltage equipment. Safety signs would be posted in conformance with applicable state and federal regulations around all turbines, transformers, and other high-voltage facilities and along access roads. Vegetation clearance would be maintained adjacent to project ingress and egress points and around the substation and padmount transformers (if used).

Fire Management

The project would be subject to County requirements for fire prevention as outlined in the County's *Altamont Pass Wind Farm Fire Requirements*. These include a requirement to prepare an annual fire prevention plan, which must provide a map of facilities, water supply locations, and access routes. The plan would also require maintenance of firebreaks, clearance around electrical lines, and requirements for year-round water supplies of at least 5,000 gallons to be provided for firefighting purposes.

Hazardous Materials Storage and Handling

The County's Hazardous Materials Program Division is the Certified Unified Program Agency (CUPA) for all areas of Alameda County. A Hazardous Materials Business Plan (HMBP) would be developed for the proposed project and subject to County approval pursuant to the requirements of the CUPA. The HMBP would contain specific information regarding the types and quantities of hazardous materials, as well as their production, use, storage, spill response, transport, and disposal. Management of hazardous materials would be conducted in accordance with the HMBP.

Hazardous materials used during O&M activities would be stored within an offsite O&M building in Tracy or unincorporated San Joaquin County, in aboveground containers with appropriate spill containment features as prescribed by the local fire code or the SPCC Plan for the O&M building as stipulated by the appropriate regulatory authority. Such materials would be similar in type and amount to those currently stored and used for O&M for the existing facility.

Lubricants used in the turbine gearbox are potentially hazardous. The gearbox would be sealed to prevent lubricant leakage. The gearbox lubricant would be sampled periodically and tested to confirm that it retains adequate lubricating properties. When the lubricants have degraded to the point where they are no longer adequate, the gearbox would be drained, new lubricant added, and the used lubricants disposed of at an appropriate facility in accordance with all applicable laws and regulations.

Transformers contain oil for heat dissipation. The turbine step-up transformers are sealed and contain no polychlorinated biphenyls or moving parts. The oil in these transformers would not be subject to periodic inspection and does not need replacement. The oil in the main power transformer in the substation would be periodically inspected for contaminants and dissolved gases to ensure continued reliable operation.

O&M vehicles would be properly maintained to minimize leaks of motor oil, hydraulic fluid, and fuel. During operation, O&M vehicles would be serviced and fueled at the proposed O&M building (using mobile fuel tanks) or at an offsite location. No storage tanks are located within the existing project site, and none are proposed.

2.1.4.8 Post-Project Decommissioning

The anticipated life of the windfarm is more than 30 years, as upgrading and replacing equipment could extend the operating life indefinitely with appropriate permit approvals. However, the life of the project for California Environmental Quality Act (CEQA) purposes and the application for a CUP would be 35 years. After that time, decommissioning would involve removing the turbines, transformers, and related infrastructure in accordance with landowner agreements. Substations and meteorological (met) towers may be removed and the sites reclaimed; alternatively, the sites could be retained for continued use. Decommissioning could also occur in conjunction with a subsequent repowering process in which some components including foundations or underground infrastructure and disturbed or graded areas are reused for new turbines. Future decommissioning is described here for informational purposes, but is not part of the project evaluated in this SEIR because the details are unknown at this time and would be speculative.

2.1.5 Required Approvals

Implementation of the project may require discretionary actions and approvals from the following agencies.

2.1.5.1 Alameda County

- Consideration and Certification of a Final SEIR, and adoption of Findings of Fact, Mitigation Monitoring and Reporting Program, Statement of Overriding Considerations by the East County Board of Zoning Adjustments.
- Approval of the CUP by the East County Board of Zoning Adjustments.
- Issuance of grading permits by the Grading Section of the Alameda County Public Works Agency.
- Minor roadway encroachment permits from the Alameda County Public Works Agency for transporting large pieces of equipment and other activities.
- Demolition Permit (for decommissioning activities) and Building Permit from Alameda County Building Inspection Department (Public Works Agency).

2.1.5.2 Other Responsible Agencies

- San Joaquin Regional Transit District may require roadway encroachment permits for transporting large pieces of equipment and other activities
- California Department of Transportation may require special permit for the movement of vehicles and loads exceeding statutory size and weight limitations (California Vehicle Code Division 15).
- The U.S. Fish and Wildlife Service (USFWS) may require incidental take authorization under the Endangered Species Act for effects on species listed as threatened or endangered.
- The U.S. Army Corps of Engineers may require a Clean Water Act Section 404 permit
- The State Water Resources Control Board may require a Water Quality Certification (Section 401).
- FAA may require a Notice of Proposed Construction or Alteration; Determination of No Hazard.
- The California Department of Fish and Wildlife (CDFW) may require incidental take authorization under the California Endangered Species Act for effects on species listed as threatened and endangered and/or those species considered candidates for listing under the California Endangered Species Act.

- CDFW may require a Lake and Streambed Alteration Agreement if state regulated rivers, streams, or lakes may be affected.
- The State Water Resources Control Board will require a Construction General Permit for management of stormwater during decommissioning and construction activities, and a Notice of Intent as required under Clean Water Act Section 402 of the National Pollutant Discharge Elimination System program.

2.2 Program-Level Updated Information

The PEIR, prepared pursuant to State CEQA Guidelines Section 15168, was certified on November 12, 2014. The PEIR represented a program-level evaluation of the planned repowering of the APWRA, with focused attention on two program alternatives of total buildout or complete repowering, either 417 MW (Alternative 1, based on the peak level of production capacity in Alameda County as of 1998, when a repowering program was first adopted by Alameda County) or 450 MW (Alternative 2, based on a modest increase of less than 10% in energy production over Alternative 1). The PEIR also incorporated project-level evaluation of two proposed repowering projects, the Golden Hills Wind Project proposed by NextEra Energy Resources and the Patterson Pass Project proposed by EDF Renewable Energy.

Since preparation of the PEIR, some changes have occurred that could affect the repowering program that was analyzed in the PEIR. The SEIR prepared for the Sand Hill Wind Repowering Project (February 2020) amended the PEIR to reflect changes that occurred since the PEIR was certified as well as to incorporate new information and changed conditions relevant to that project. The issues addressed in the Sand Hill Wind Repowering Project SEIR included: changes to wind resource area capacity; changes in wind turbine technology; the latest science and monitoring results regarding avian and bat fatalities; an updated raptor conservation mitigation measure; amendments to setback requirements; clarifications regarding FAA lighting requirements; clarifications to mitigation measures addressing site development review procedures; changes to avian protection plan and annual reporting requirements; and changes in project disturbance estimates. This SEIR further amends the PEIR, including some of the issues addressed in the Sand Hill SEIR, to address:

- Wind Resource Area capacity.
- Changes in wind turbine technology.
- Latest science and monitoring results regarding avian and bat fatalities.
- Updated information on cumulative impacts on avian and bat species.
- Updated raptor conservation mitigation measure.

These issues are described in more detail below and are reflected in the analysis in the environmental topics evaluated in Chapter 3, *Impact Analysis*.

2.2.1 Wind Resource Area Capacity

2.2.1.1 PEIR Assumptions

The PEIR identified two alternatives for repowering the APWRA, with separate buildout scenarios using either a limited level of 417 MW of generating capacity (Alternative 1), equal to the operating capacity that existed in 1998 when the County first approved a program for repowering the APWRA, or a maximum of 450 MW of capacity (Alternative 2), which represented an increase of less than 10% over Alternative 1. The PEIR analyzed both alternatives at an equal level of detail, and, because the County adopted and certified the PEIR without identifying a preferred alternative, the County may authorize wind energy development consistent with either alternative.

The PEIR analyzed two specific repowering projects, Golden Hills and Patterson Pass, and, for cumulative analysis purposes, identified four other potential or foreseeable future projects that could together generate about 358 MW (Table 2-6 in the PEIR, p. 2-47): Golden Hills Phase 2, Summit Wind, Mulqueeney Ranch (the proposed project), and Sand Hills Wind. Since the proposed project was included in the PEIR, this SEIR is appropriately tiered from the PEIR.

2.2.1.2 Buildout Under the PEIR

Table 2-6 provides an updated record of operational, approved, and proposed repowering projects within the APWRA to date, including the proposed project. As shown, the total gross MW of wind development resulting from the combined individual projects within the APWRA is 444.3 MW, which is within the total production capacity of 450 MW (Alternative 2) described in the PEIR.

Although the total production capacity remains under 450 MW, it should be noted that several of the projects evaluated in the PEIR were modified to varying degrees. The Golden Hills Wind Project, described in the PEIR as a proposal for 52 turbines of 1.7 MW each (88.4 MW total) and approved by the County as such, was built instead with 48 turbines with a nameplate capacity of 1.79 MW each, thus yielding a total of 85.9 of MW installed or nameplate capacity. The second phase of the Golden Hills Wind Project, the Summit Wind Project, and the Sand Hill Wind Project were also modified since PEIR certification. The second phase of Golden Hills, later known as Golden Hills North, was projected as being composed of 24 turbines also with a nameplate capacity of 1.7 MW each and a total capacity of 41 MW, but was instead constructed of 20 turbines of 2.3 MW each, thus yielding 46 MW of capacity. The Summit Wind Project was identified in the PEIR as a 95 MW project, but it was approved in 2016 for a total of only 54 MW and was recently approved (in May 2020) to permit an additional 3.5 MW (totaling 57.5 MW). The Sand Hill Wind Project was projected in the PEIR to be a 34 MW project and was approved for 36 MW in 2016, ~~but was~~ revised again and approved for 109.5 MW in February 2020, and revised again and approved for 50 MW in December 2020.

As shown in Table 2-6, the Rooney Ranch Project (which is under the separate jurisdiction and ownership of the City of Santa Clara), was also approved for repowering with a nameplate capacity of 25.1 MW, with environmental analysis tiered under the PEIR. Although it was not listed specifically in the PEIR, this project was among the anticipated projects considered in the previous 1998 Program EIR for repowering the APWRA, and lies within the PEIR program area. Additionally, the 20.5 MW Diablo Winds project, a repowered project approved in 2003 and in operation since 2004, is listed in Table 2-6 because it is an operational project in the APWRA. Because it existed at the time of preparation of the PEIR, it was not included in the 450 MW evaluated in the PEIR under

Alternative 2. This project is included in Table 2-6, however, to identify the total wind development production potential within the APWRA.

2.2.1.3 Proposed Project

As shown in Table 2-6, the proposed project would add 80 MW of capacity to the APWRA, consistent with the assumed nameplate capacity for Mulqueeney Ranch in the PEIR (Table 2-6 in the PEIR, p. 2-47).

Table 2-6. Approved, Operational, and Proposed Projects in the APWRA

Project Name	Owner/Operator	CEQA Document Used or Anticipated to be Prepared (Status)	Total MW
Operating Prior to PEIR			
Diablo Winds	Glidepath	1998 EIR[a] (Operational since 2005)	**20.5**
Approved Projects			
Patterson Pass	EDF (now Centauri)	PEIR (Expired)	~~19.8~~ (0)
Golden Hills	NextEra	PEIR (Operational)	85.9
Golden Hills North	NextEra	PEIR-Tiered (Operational)	46
Summit Wind[b]	AWI (now Castlelake, LP)	PEIR-Tiered (Under construction)	57.5
Rooney Ranch[c]	sPower	PEIR-Tiered (Not yet ~~operational~~ under construction)	25.1
Sand Hill[d]	sPower	SEIR Tiered from PEIR (Not yet ~~operational~~ under construction)	~~109.5~~ 50.0
		Subtotal	**~~364.3~~ 285.0**
Proposed Project			
Mulqueeney Ranch	Brookfield	SEIR Tiered from PEIR (this document)	80
		Combined Gross Total MW	**~~444.3~~ 365.0**

MW = megawatts

[a] The 1998 Program Repowering EIR is now considered superseded by the 2014 Program EIR.

[b] Summit Wind was approved in January 2016 for 27 turbines and a combined capacity of up to 54.0 MW; however, in May 2020 project revisions were approved to use 23 larger capacity turbines, resulting in a capacity of 57.5 MW.

[c] The Rooney Ranch Project proposed by sPower was approved by the City of Santa Clara on June 25, 2019.

[d] The Sand Hill Project was approved by the County in February 2020, based on a 109.5-MW alternative evaluated in its SEIR, instead of the project proposal for a 144.5-MW project. Certification of the Sand Hill Final SEIR and approval of the CUP was subsequently appealed ~~and its approval is presently being held in abeyance pending a~~ . A hearing to consider the appeal was held by the Alameda County Board of Supervisors ~~to consider the appeal.~~ on December 15, 2020, during the public review period for the Mulqueeney Ranch draft SEIR. At that hearing, the Board denied the appeal and upheld the Sand Hill SEIR and approved a revised project with a maximum capacity of 50 MW and no more than 16 total turbines.

[e] The Patterson Pass Project no longer has an approved status, nor is it currently proposed for repowering, so its MW capacity can be subtracted from the total column in this table.

2.2.1.4 Potential Future Projects

In addition to the information provided in Table 2-6, County planning staff has received information from Clearway Energy (formerly NRG), which is planning a repowering project on portions of the

Altamont Landfill. Because the number of MWs to be developed is not yet known, the Clearway project is not listed in Table 2-6. Environmental review for the Clearway project would occur at a later date.

2.2.2 Changes in Wind Turbine Technology

The PEIR analyzed projects with a range of turbine sizes. Table 2-7 shows the maximum dimensions of turbines in this range compared with the largest of three turbine types under consideration for the proposed project.

Table 2-7. Turbine Specifications Contemplated in the PEIR and for Use with the Proposed Project

Turbine Model	PEIR Typical – 3.0 MW[1]	Proposed Range of Turbines
Nameplate capacity	3.0 MW	2.2 to 4.2 MW
Rotor type	3-blade/horizontal axis	3-blade/horizontal axis
Blade length	62.5 m (205 ft)	60-68 m (197-223 ft)
Rotor diameter	125 m (410 ft)	120-136 m (394394-446 ft)
Rotor-swept area	12,259 m2 (131,955 ft^2)	11,310-14,527 m^2 (121,740-156,367 ft2)
Tower type	Tubular	Tubular
Tower (hub) height	96 m (315 ft)	80-86 m (262-282 ft)
Total height (from ground to top of blade)	153 m (502 ft)	140-152 m (459-499 ft)
Height of swept area above ground	33.5 m (110 ft)	20-25 m (66-82 ft)

ft = feet; ft^2 = square feet; m = meters; m^2 = square meters; MW = megawatts.

[1] The smallest size of turbine described in the PEIR had a nameplate capacity of 1.6 MW. The Patterson Pass project that was evaluated in the PEIR at a project level considered a 3.3 MW turbine with a 112-meter (367–foot) rotor diameter and 84-meter (276-foot) hub height. Though capable of more MW production, it was not physically larger in dimensions than the largest turbine considered typical for the PEIR.

As shown in Table 2-7, the specifications of the PEIR typical turbines would be within the proposed Mulqueeney Ranch Wind Repowering Project turbine range specifications established in the PEIR for rotor type, tower type, and total height. However, the proposed nameplate capacity would be up to 40% greater (up to 4.2 MW versus 3.0 MW), blade lengths would be up to 5.5 meters (18 feet) longer (an increase of up to 9%), rotor diameters would be up to 11 meters (36 feet) greater (an increase of up to 9%), rotor-swept area would increase by up to 24,412 square feet (2,268 square meters) (an increase of up to 19%), and the height of the swept area above ground would be up to 19.5 meters (64 feet) lower than the typical turbines evaluated in the PEIR.

Although a 3 MW turbine was the largest considered in the PEIR, for purposes of the analysis of avian mortality, the turbine used as the basis for developing estimates of future or typical project impacts in the PEIR was the Vasco Winds 2.3 MW turbine. The consequence of the increased nameplate capacity proposed for the project, up to 4.2 MW, however, could be lower impacts per MW for certain environmental topic areas. More specifically, impacts could be reduced because, as proposed for the project, 19 turbines rated at 4.2 MW each would result in 79.8 MW of generating capacity, whereas the same capacity could only be reached through installation of 36 of the proposed 2.2 MW turbines, thereby requiring considerably more land area and resulting in greater ground-disturbing activity to reach the same capacity.

2.2.3 Latest Science and Monitoring Results Regarding Avian and Bat Fatalities

New science and monitoring results acquired since certification of the PEIR in 2014 and used in the impact analysis presented here primarily consist of the following:

- New and revised fatality monitoring reports for old-generation and repowered projects:
  - *Vasco Avian and Bat Monitoring Project 2012–2015 Final Report* (Brown et al. 2016).
  - *Final Report Altamont Pass Wind Resource Area Bird Fatality Study. Monitoring Years 2005–2013* (ICF 2016).
  - *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Report: Year 1* (H. T. Harvey & Associates 2018a).
  - *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Report: Year 2* (H. T. Harvey & Associates 2018b).
  - *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Project: Final 3-Year Report* (Draft) (H. T. Harvey & Associates 2020).
  - *Golden Hills North Wind Energy Center Postconstruction Fatality Monitoring Report: Year 1* (Draft) (Great Basin Bird Observatory and H. T. ~~Harvey & Associates 2020~~ Harvey & Associates 2020a).
  - *Golden Hills North Wind Energy Center Postconstruction Fatality Monitoring Report: Years 1 and 2* (Draft) (Great Basin Bird Observatory and H. T. Harvey & Associates 2020b).
- New studies of golden eagles in and near the APWRA:
  - *Estimation of occupancy, breeding success, and predicted abundance of Golden Eagles (*Aquila chrysaetos*) in the Diablo Range, California, 2014* (Wiens et al. 2015).
  - *Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update* (U.S. Fish and Wildlife Service 2016).
  - *GPS Satellite Tracking of Golden Eagles (*Aquila chrysaetos*) in the Altamont Pass Wind Resource Area (APWRA) and the Diablo Range: Final Report for Phases 1 and 2 of the NextEra Energy Settlement Agreement* (Bell 2017).
  - *Spatial Demographic Models to Inform Conservation Planning of Golden Eagles in Renewable Energy Landscapes* (Wiens et al. 2017).
  - *Distribution, nesting activities, and age-class of territorial pairs of golden eagles at the Altamont Pass Wind Resource Area, California, 2014–2016* (Kolar and Wiens 2017).
  - *Addendum to Comparison of Wind Turbine Collision Hazard Model Performance: One-year Post-construction Assessment of Golden Eagle Fatalities at Golden Hills* (Smallwood 2018).
  - *Golden eagle population monitoring in the vicinity of the Altamont Pass Wind Resource Area, California, 2014–2018* (Wiens and Kolar 2019).
- New turbine micro-siting studies:
  - *Siting Wind Turbines to Minimize Raptor Collisions at the Patterson Pass Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2015a).

  - *Siting Wind Turbines to Minimize Raptor Collisions at Golden Hills North Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2015b).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Golden Hills North Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2015c).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Sand Hill Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2016b).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Summit Winds Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2016c).
  - *Siting wind turbines to minimize raptor collisions at Sand Hill Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2018).
  - *Assessment of proposed wind turbine sites to minimize raptor collisions at the Sand Hill Wind Repowering Project in the Altamont Pass Wind Resource Area* (Estep 2019).
- Other reviews of wind power impacts on birds and bats, in the APWRA and elsewhere:
  - *Comparing Bird and Bat Use Data for Siting New Wind Power Generation* (Smallwood and Neher 2016a).
  - *Bird and Bat Impacts and Behaviors at Old Wind Turbines at Forebay, Altamont Pass Wind Resource Area* (Smallwood and Neher 2016d).
  - *Comparison of Wind Turbine Collision Hazard Model Performance Prepared for Repowering Projects in the Altamont Pass Wind Resource Area* (Smallwood and Neher 2017).
  - *Impacts to wildlife of wind energy siting and operation in the United States* (Allison et al. 2019)
  - *Evidence of region-wide bat population decline from long-term monitoring and Bayesian occupancy models with empirically informed priors* (Rodhouse et al. 2019).
  - *Relating bat and bird passage rates to wind turbine collision fatalities* (Smallwood and Bell 2019).
  - *Skilled dog detections of bat and small bird carcasses in wind turbine fatality monitoring* (Smallwood et al. 2019).

The assessment of avian and bat species potentially at risk is based on a review of existing fatality data for the APWRA, species occurrence data in and around the program and project areas, the current understanding of those species' susceptibility to current-generation turbine–related mortality, and known trends in fatalities at wind energy facilities in general. As such, the above-listed data sources are cited and discussed at length in the analysis of biological resource impacts in Section 3.4, *Biological Resources*, to make sure that the analysis appropriately considers the latest science and knowledge of avian and bat species with respect to potential impacts from wind energy facilities.

Future wind energy proposals will be required to incorporate the latest research available at the time their application is deemed complete, in the same manner as Mulqueeney Ranch Wind is obligated through this SEIR to incorporate the most current avian monitoring reports of individual projects, as well as other population and mortality studies that have been prepared.

2.2.4 Updated Information on Cumulative Impacts on Avian and Bat Species

The analysis of cumulative operational impacts on birds and bats in this SEIR uses bird and bat population size estimates that were not referenced in the PEIR. For golden eagles, the analysis in this SEIR considers the local area population as defined by USFWS (2013) overlaid with a golden eagle habitat suitability map prepared by CDFW (2016) to demonstrate that the local area population of golden eagles greatly exceeds the populations within the project site, the APWRA, and the combined APWRA and Montezuma Hills Wind Resource Area. For other birds, cumulative wind power fatalities were compared to the Partners in Flight (2020) population estimates for Bird Conservation Region (BCR) 32, a regional area used by USFWS and others for tracking conservation of native birds. This SEIR also considers population trend data provided by the U.S. Geological Survey (2020) indicating the long-term population trend for each avian focal species in BCR 32, as well as the level of confidence in those trend data. For bats, population status is inferred on the basis of the following published scientific information.

- *Tadarida brasiliensis, Brazilian Free-tailed Bat* (Barquez et al. 2015).
- *Fatalities at wind turbines may threaten population viability of a migratory bat* (Frick et al. 2017).
- *Evidence of region-wide bat population decline from long-term monitoring and Bayesian occupancy models with empirically informed priors* (Rodhouse et al. 2019).
- *First direct evidence of long-distance seasonal movements and hibernation in a migratory bat* (Weller et al. 2016).

The above approach provides more fine-grained analysis than was included in the PEIR, allowing for a species-by-species assessment of potential cumulative impacts in consideration of their population status and potential mortality from wind energy facilities.

2.2.5 Updated Raptor Conservation Mitigation Measure

One of six strategies or components collectively identified in the PEIR as Mitigation Measure BIO-11h (*Compensate for the loss of raptors, including golden eagles, by contributing to conservation efforts*) provided for funding of local or regional conservation efforts, based on reported costs for rehabilitating the typical injured raptor (indicated as $580/raptor fatality in the PEIR based on interviews with staff at the University of California, Davis Raptor Center). The County has modified Mitigation Measure BIO-11h so that now, or after any initial 10-year period, projected costs are adjusted for inflation according to the Consumer Price Index. Such adjustment would occur on the tenth anniversary of commercial operations, or (in the case of a request to revise it during the 10-year period) at the time that a monitoring report is accepted by the Planning Director showing a change in total raptor fatalities for the project. Both the proposed project and future projects require implementation of BIO-11h, which provides, as noted above, a range of strategies for contributing to raptor conservation.

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Chapter 3
Impact Analysis

Introduction

This chapter provides environmental analyses of the physical impacts that could result from approval and implementation of the Mulqueeney Ranch Wind Repowering Project (project or proposed project). The chapter is organized into separate sections for each resource analyzed, as listed below. Each section provides a description of the environmental and regulatory setting, significance criteria and methodology used in the impact analysis, and the potential project impacts and required mitigation measures.

Project Approach

The specific characteristics of the project are considered in the assessment of the project-level impacts of the proposed project in each of the CEQA topic sections.

Chapter Organization

This chapter is organized into the following sections.

- 3.1, *Aesthetics*
- 3.2, *Agricultural and Forestry Resources*
- 3.3, *Air Quality*
- 3.4, *Biological Resources*
- 3.5, *Cultural Resources*
- 3.6, *Energy*
- 3.7, *Geology, Soils, Mineral Resources, and Paleontology*
- 3.8, *Greenhouse Gas Emissions*
- 3.9, *Hazards and Hazardous Materials*
- 3.10, *Hydrology and Water Quality*
- 3.11, *Land Use and Planning*
- 3.12, *Noise*
- 3.13, *Population and Housing*
- 3.14, *Public Services*
- 3.15, *Recreation*
- 3.16, *Transportation*

- 3.17, *Tribal Cultural Resources*
- 3.18, *Utilities and Service Systems*
- 3.19, *Wildfire*

Program-Level Updated Information

Section 2.2 in Chapter 2, *Project Description*, describes updates to information that was provided in the PEIR on a variety of topics, and which is relevant to the project and future projects anticipated to be proposed and reviewed under the PEIR (with tiering pursuant to CEQA). These topics include:

- Wind resource area capacity;
- Changes in wind turbine technology;
- Latest science and monitoring results regarding avian and bat fatalities;
- Updated information on cumulative impacts on avian and bat species; and
- Updated raptor conservation mitigation measure.

Refer to Section 2.2 in Chapter 2, *Project Description*, for a description of these changes. The impact analyses in this chapter of the SEIR focus on the extent to which these changes would result in new or substantially more severe significant effects than what was previously evaluated in the PEIR.

3.1 Aesthetics

This section identifies the visual resources in and around the Mulqueeney Ranch Wind Repowering Project (project) site, describes impacts on these resources that could result from implementation of the project, and prescribes mitigation measures where feasible and appropriate. This section is based generally on the Program Environmental Impact Report's (PEIR's) determinations that the repowering program could result in specific types of adverse aesthetic and visual impacts as defined in the State California Environmental Quality Act (CEQA) Guidelines (Appendix G), and considers whether changes in the project as well as changes in circumstances and new information would result in new or different visual impacts relative to what was presented in the PEIR. The Federal Highway Administration's (FHA) 1988 guidance for analyzing visual impacts, which was used in the PEIR analysis, was updated in the January 2015 document *Guidelines for the Visual Impact Assessment of Highway Projects*. As a result, the methodologies in this section have been updated to reflect the FHA's current methodologies for analyzing visual impacts, so the guidance in this document section differs from the guidance in the PEIR.

3.1.1 Concepts and Terminology

Aesthetic resources include all landforms, water bodies, plants, trees, animals, and objects visible within a landscape or field of view, including natural, artificial, moving, and stationary structures and features. These resources add to or detract from the scenic quality of the landscape (i.e., the visual appeal of the landscape). A visual impact is the creation of an intrusion or perceptible contrast that affects the scenic quality of a viewscape. A visual impact can be perceived by an individual or group as either positive or negative, depending on a variety of factors or conditions (e.g., personal experience, time of day, weather, seasonal conditions).

Identifying a study area's aesthetic resources and conditions involves understanding the visual character of the area's visual features and the regulatory context. Using the FHA's 2015 *Guidelines,* once those parameters are understood, a study area's aesthetic resources are further defined by establishing the Area of Visual Effect (AVE) and documenting the visual character of the environmental setting, including the natural and built (or "cultural") environments. For the purposes of this section's analysis, the "study area" and AVE are synonymous. The affected population, or viewers, are defined by their relationship to the study area, their visual preferences, and their sensitivity to changes associated with the improvements. Visual preferences, or what viewers like and dislike about the AVE's visual character, define the AVE's visual quality. Visual quality serves as the baseline for determining the degree of visual impacts and whether a project's visual impacts would be adverse, beneficial, or neutral.

The impact assessment methodology for aesthetic resources includes the following components:

- Establish the AVE for aesthetics resources and determine landscape units.
- Inventory and describe the affected environment, affected viewers, and existing visual quality and identify key observation points (KOPs) and views for visual assessment.
- Assess visual compatibility and viewer sensitivity and analyze visual impacts.
- Propose methods to mitigate significant visual impacts (Federal Highway Administration 2015).

Other key concepts discussed below that CEQA (in Appendix G of the State CEQA Guidelines) requires an EIR to address or determine if the project's aesthetic impacts are significant include *scenic vistas*, *visual character,* and *public views*. As discussed below, scenic vistas are defined in the County's *Scenic Route Element*; visual character is broken down into components of natural and cultural or built environments; and public views are distinguished from the views of individual residents and business operators and their employees.

3.1.1.1 Visual Character

The environmental setting comprises the natural, cultural, and project environments that constitute the AVE. For the purpose of defining aesthetic and visual resources, the *natural environment* is determined by the visual character of the land, water, vegetation, animals, and atmospheric conditions. The *cultural environment* is determined by the visual character of buildings, infrastructure, structures, and other artifacts and art. The *project environment* focuses down from the larger context of the natural and cultural environments and concentrates directly upon the project site. As such, there is overlap between the natural and cultural environments and the project environment. However, the project environment is comprised of visible elements immediately within a project site's boundaries and includes the existing development footprint, the transportation corridor geometrics within the existing right-of-way (for transportation-related projects), terrain and grading, constructed elements, vegetative cover, and other ancillary visual elements found in the corridor of a modern transportation system (Federal Highway Administration 2015).

The perception of visual character can vary significantly seasonally, even hourly, as weather, light, shadow, and elements that compose the viewshed change. The basic components often used to describe visual character for most visual assessments are the elements of form, line, color, and texture of the landscape features (U.S. Forest Service 1995). The appearance of the landscape is described in terms of the dominance of each of these components.

3.1.1.2 Affected Viewer Groups and Viewer Response

Two overarching groups of viewers are affected by a project: neighbors and users. *Neighbors* are those people who have views *of* a project site because they are adjacent to it. *Users* are those people who are within project site boundaries and have views *from* a project site. The types of neighbors and users that can be affected by a project include residential, recreational, retail, commercial, institutional, civic, industrial, and agricultural viewers and travelers. Travelers can include pedestrians, cyclists, motorists, and rail users that use various modes of transportation for commuting, touring, and shipping.

Viewer response is a measure or prediction of the viewer's reaction to the visual environment and has two dimensions as previously mentioned, *viewer exposure* and *viewer sensitivity*. *Viewer exposure* is a measure of the viewer's ability to see a particular object and is based on the position of the viewer in relationship to the object being viewed, how many people see the object, and how long a viewer is able to keep an object in view. *Viewer sensitivity* is a measure of the viewer's recognition of a particular object and is based on viewer activity, awareness, and local values. Activity relates to the preoccupation of viewers—are they preoccupied, thinking of something else, or are they truly engaged in observing their surroundings. Awareness relates to the focus of view—the focus is wide and the view general or the focus is narrow and the view specific. Local values and attitudes also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by local, state, or national designation, it is likely that viewers will be more sensitive to visible changes. Visual sensitivity is modified by the type of viewer, viewer activity, and visual expectations. For example, people driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners generally have higher visual sensitivity to views. Viewers using recreational trails and areas, scenic highways, and scenic overlooks usually pay more attention to their surroundings, seek views, and have higher regard for the landscape composition. Residential viewers typically have extended viewing periods and are more concerned about and aware of changes in the views from their homes. Sensitivity tends to be lower for people driving to and from work or as part of their work because commuters and non-recreational travelers typically have fleeting views and tend to focus on commute traffic, not on surrounding scenery (Federal Highway Administration 2015, U.S. Department of Agriculture Forest Service 1995, U.S. Soil Conservation Service 1978).

To identify the importance of views of a resource, a viewshed must be broken into distance zones that are based off of to the position of the viewer and are measured from one static point. As individual viewers move, so does the point from which the foreground, middleground, and background are measured. Generally, the closer a resource is to the viewer, the more dominant it is and the greater its importance to the viewer. Although distance zones in a viewshed may vary between different geographic region or types of terrain, the standard foreground zone is up to 0.25–0.5 mile from the viewer, the middleground zone from the foreground zone to may extend 3 miles from the viewer, and the background zone from the middleground to infinity (Litton 1968).

3.1.1.3 Visual Quality

Visual quality is affected by *aesthetics*—the study of pleasing perceptual experiences as seen by humans. These perceptions are remarkably consistent within a society and across cultures, even though an individual's experience of visual quality is unique because of previous life experiences. Visual quality is a function of what the viewer wants or expects to see and what is actually seen. If people see what they want or expect to see, then the visual quality is good or high because the viewer is pleased. However, if what is seen is lacking or not what is expected, then visual quality is poor or low because the viewer is disappointed. Different viewers and viewer groups value visual resources in different ways; therefore, there are different appraisals of visual quality. Regardless, there is a range of viewer responses inherent in all humans that aids in evaluating visual quality.

The natural and cultural environment are elements that make up the overall visual quality for a complete visual landscape. The value placed on visual resources correlates to whether those resources meet the viewer's preferred concepts of natural harmony and cultural order. The more visual preferences and expectations are met by the landscape composition, the more that landscape is revered for its views and the more memorable, or vivid, it becomes. Visual features do not intrude but belong to a landscape of a harmonious nature in an orderly society. Project coherence, or how a proposed project integrates within the natural and cultural landscape, can affect visual quality.

- Natural harmony: The natural environment creates a sense of natural harmony in people. The visual character of the natural environment's visual resources and viewer preferences affect the perception of natural harmony and the viewers inherently evaluate and determine if the composition is harmonious or inharmonious.
- Cultural order: The cultural environment creates a sense of cultural order in people. The visual character of the cultural environment's visual resources and viewer preferences affect the perception of order and the viewers inherently evaluate and determine if the composition is orderly or disorderly.

- Project coherence: The project environment creates a sense of project coherence in people. The visual character of the project environment in combination with viewer preferences affect the perception of project coherence; viewers consciously or unconsciously evaluate the composition of the viewscape and determine if it is coherent or incoherent.

Viewer preferences are established using a professional observational or public involvement approach. Professional observation is used on projects with average complexity and minimal controversy by identifying standard visual preferences associated with affected viewer groups that are adjusted to reflect state and local regulations protecting visual resources. More complex and controversial projects often engage affected stakeholders (i.e., neighbors and users) through public outreach and involvement to help define visual preferences. The analysis in this Subsequent EIR (SEIR) uses the professional observational approach (Federal Highway Administration 2015).

3.1.2 Existing Conditions

3.1.2.1 Regulatory Setting

Federal

The federal government does not explicitly regulate visual quality but recognizes its importance and preserves aesthetic values through the National Park, National Wildlife Refuge, National Monument, and National Scenic Byway Systems.

Juan Bautista de Anza National Historic Trail

The route of Juan Bautista de Anza to explore California in 1775–1776 crosses the northern and western areas of the project site. The 1,200-mile route of the Spanish explorer through Arizona and California to expand Spanish settlement in the San Francisco Bay Area included exploration of eastern Alameda County and north to the San Joaquin River and Suisun Bay. The National Park Service has undertaken the development of the Juan Bautista de Anza National Historic Trail as a continuous, 1,200-mile non-motorized recreation trail to roughly follow the historic route of the Anza expedition. The Anza Trail was designated a National Historic Trail by Congress in 1990 through an amendment to the National Trails System Act (National Park Service 1990). The Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan states its management objective is to "protect a trail ROW [right-of-way], to protect cultural and scenic resources along the trail, to foster public appreciation and understanding of the trail, to encourage facilities for resource protection and public information and use." However, the plan acknowledges that many segments of the historic trail have been altered from the effects of urbanization and changing transportation systems, which are characteristic of the trail within the project area (National Park Service 1996).

As shown in Figure 3.1-1 the route traverses the Altamont Pass area roughly parallel to Patterson Pass Road and extends north from the project vicinity to the Byron area north of Alameda County along the west side of the Central Valley. Approximately 300 miles of recreational trails have been certified so far in the two states, each segment of which is independently operated by a mix of local, state, and park services and districts, as well as private property owners (National Park Service 2020). Local certified trail segments lie between Mission Peak, Sunol Wilderness, and Lake Del Valle, several miles southwest of the project site.

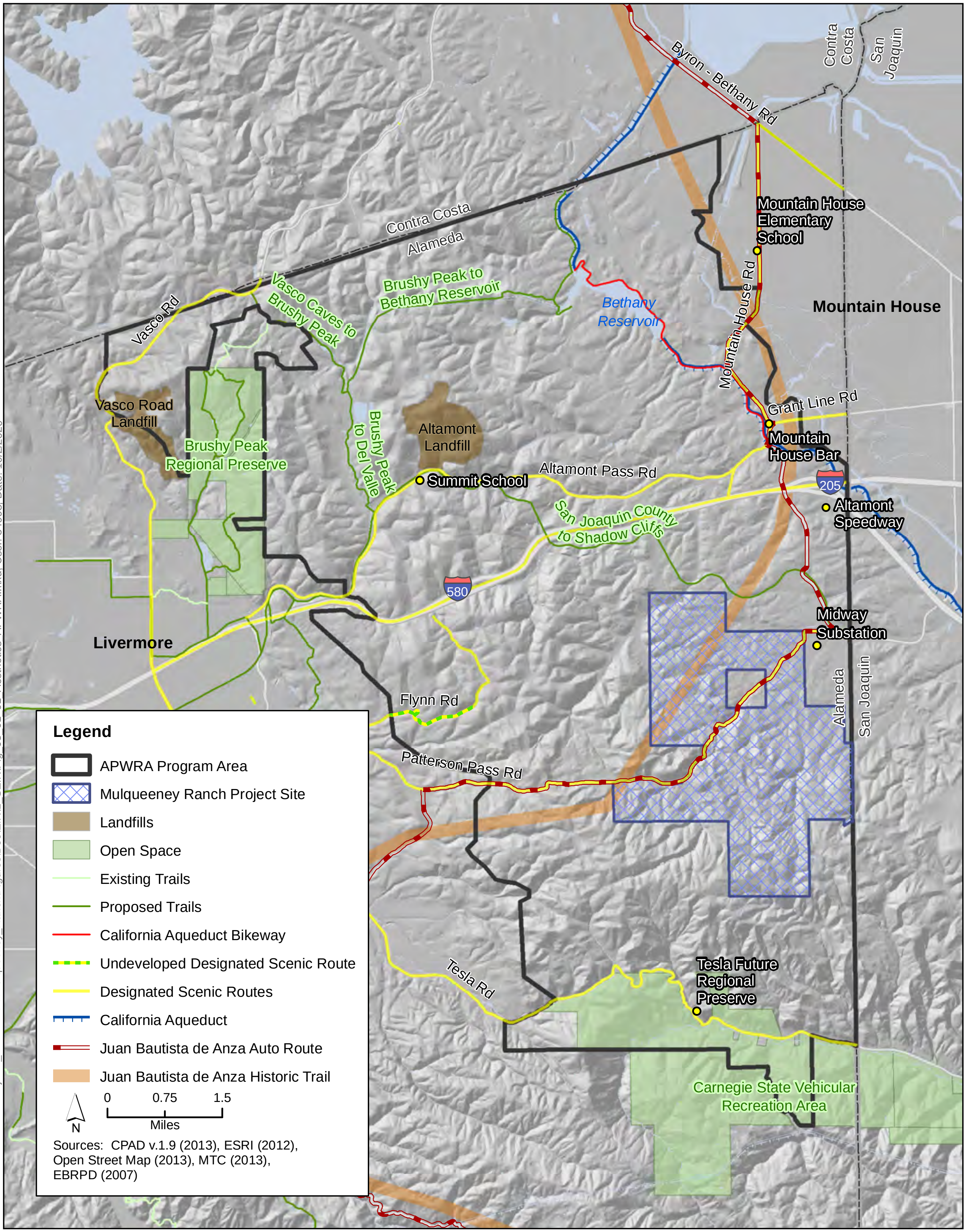

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Figure 3.1-1
Visual Resources in the Program Area

In addition to the historic trail corridor that crosses the project site, the National Park Service has designated an auto route for the trail, which traverses the project site along Patterson Pass Road. At the present time, however, designated recreational trails as part of the planned trail system do not cross the project site (Anza Trail Foundation 2020).

State

Within Alameda County and in the Altamont Pass Wind Resource Area (APWRA), Interstate 580 (I-580) from the San Joaquin County line to State Route (SR) 205 (Post Miles 0.0 to 0.393), a 0.4-mile-long segment, is a state-designated scenic highway (California Department of Transportation 2011). The I-580 intersection with SR 205 falls just within the eastern border of the program area, and approximately 1.5 miles northeast of the project site. Appendix G of the State CEQA Guidelines suggests agencies should determine if scenic resources within or along a state-designated scenic route would be substantially and adversely affected by a project, and if so to identify feasible mitigation measures.

Local

Alameda County General Plan

Scenic Route Element

The Scenic Route Element of the *Alameda County General Plan* (Scenic Route Element) provides a continuous, countywide scenic route system and is intended to serve as a guide for local jurisdictions for development of city-scale scenic route systems and as a guide for development to protect and enhance the scenic values along designated scenic routes (Alameda County 1966).

The Scenic Route Element identifies scenic freeways and expressways as traversing or connecting areas of major scenic, recreational, or cultural attractions, and as distinct from two other major types of scenic routes (scenic thoroughfares and rural-recreation routes). Scenic routes are defined to consist of three elements: the right-of-way, the scenic corridor, and areas extending beyond the corridor. The corridor is defined as those properties, along and up to 1,000 feet beyond the right-of-way, that either (1) should be acquired for protection, or (2) for which development controls should be applied to preserve and enhance nearby views or maintain unobstructed distant views along the route in rural areas with high scenic qualities. More specifically, scenic corridors are defined as those areas where "Development controls should be applied to preserve and enhance scenic qualities, restrict unsightly use of land, control height of structures, and provide site design and architectural guidance along the entire scenic corridor" (Alameda County 1966). For the areas extending beyond scenic corridors (i.e., beyond 1,000 feet from the right-of-way), the Scenic Route Element also requires basic development controls: in the undeveloped parts of the county, project review should address grading, removal of vegetation, streambeds, landscaping, utility and communication towers, poles and lines, and outdoor advertising signs or structures.

The program area contains one state-designated scenic route, I-580, which is also categorized as one of the County's Scenic Freeways and Expressways. Most of the other roads and highways that traverse the program area are categorized as Scenic Rural-Recreation Routes (or as mapped Major Rural Roads); these are listed below (Alameda County 1966).

- Altamont Pass Road
- Byron-Bethany Road

- Flynn Road
- Grant Line Road
- Mountain House Road
- Patterson Pass Road
- Proposed Route 239 Freeway
- Tesla Road
- Vasco Road

Patterson Pass Road bisects the project site. The project site can be viewed from I-580, located approximately 1 mile north of the nearest portion of the project site.

The Scenic Route Element provides the following principles for Scenic Route Corridors that are applicable to the project. The principles are organized loosely under five headings: the system, the rights-of-way, the corridors, the corridors *and* the remainder or balance of the County, and areas beyond the corridors. For reference in the subsequent discussions, each principle is identified by a code (e.g., SRE-Corr-1).

Provide for Normal Uses of Land and Protect Against Unsightly Features: In both urban and rural areas, normally permitted uses of land should be allowed in scenic corridors, except that panoramic views and vistas should be preserved and enhanced through supplementing normal zoning regulations with special height, area, and sideyard regulations; through providing architectural and site design review; through prohibition and removal of billboards, signs not relevant to the main use of the property, obtrusive signs, automobile wrecking and junk yards, and similar unsightly development or use of land. Design and location of all signs should be regulated to prevent conglomerations of unsightly signs along roadsides. (SRE-Corr-1).

Locate Transmission Towers and Lines Outside of Scenic Route Corridors When Feasible: New overhead transmission towers and lines should not be located within scenic corridors when it is feasible to locate them elsewhere. (SRE-Corr-2).

Underground Utility Distribution Lines When Feasible; Make Overhead Lines Inconspicuous: New, relocated or existing utility distribution lines should be placed underground whenever feasible. When it is not feasible to place lines underground, they should be located so as to be inconspicuous from the scenic route. Poles of an improved design should be used wherever possible. Combined or adjacent rights-of-way and common poles should be used wherever feasible. (SRE-Corr-3).

Use Landscaping to Increase Scenic Qualities of Scenic Route Corridors: Landscaping should be designed and maintained in scenic route corridors to provide added visual interest, to frame scenic views, and to screen unsightly views. (SRE-Corr-5).

Control Tree Removal: No mature trees should be removed without permission of the local jurisdiction as a means of preserving the scenic quality of the county. (SRE-Corr/Rem-5).

Control Alteration of Streambeds and Bodies of Water: Alteration of streambeds or bodies of water and adjacent vegetation should be permitted only with approval of the local jurisdiction, as a means of preserving the natural scenic quality of the stream courses, bodies of water, vegetation and wildlife in the county. Development along edges of streams, canals, reservoirs, and other bodies of water should be designed and treated so as to result in naturalistic, architectural, or sculptural forms. (SRE-Corr/Rem-6).

Preserve and Enhance Natural Scenic Qualities in Areas Beyond the Scenic Corridor: Views from scenic routes will comprise essentially all of the remainder of the county beyond the limits of the scenic corridor: the corridor is intended to establish a framework for the observation of the views beyond. Therefore, in all areas in the county extending beyond the scenic route corridors, scenic qualities should be preserved through retaining the general character of natural slopes and natural formations, and through preservation and enhancement of water areas, watercourses, vegetation and wildlife habitats. Development of lands adjacent to scenic route corridors should not obstruct views of scenic areas and development should be visually compatible with the natural scenic qualities. (SRE-Beyond Corr-1).

Provide for Normal Uses of Land but Limit Overhead Utilities and Outdoor Advertising Structures: In both developed and undeveloped areas, outdoor advertising structures, utility and communication towers, poles, and wires should be located only where they will not detract from significant scenic views. All other structures and use of land should be permitted as specified in the local zoning ordinance as supplemented by special height regulations. (SRE-Beyond Corr-2)

Lastly, the Scenic Route Element establishes development standards that are applicable to the project.

Alteration to natural or artificial land contours should not be permitted without a grading permit issued by the local jurisdiction as a means of preserving and enhancing the natural topography and vegetation in developable areas. Mass grading should not be permitted. The following criteria should be applied in the review of grading permits in developable areas:

- As a means of preserving natural *ridge skylines* within the county, no major ridgeline should be altered to the extent that an artificial ridgeline results.
- Access roads should be located and designed to keep grading to a minimum.
- Natural ground contours in slope areas over 10% should not be altered more than 5% overall, except in such slope areas where large stands of mature vegetation, scenic natural formations or natural watercourses exist, where grading should be limited so as to preserve the natural features.
- Any contour altered by grading should be restored by means of land sculpturing in such a manner as to minimize run-off and erosion problems, and should be planted with low maintenance, fire resistant plant materials that are compatible with the existing environment.

Open Space Element

The following principles from the Open Space Element of the General Plan (Open Space Element) are applicable to the project.

Include Natural Ridgelines and Slope Areas: Natural ridgelines, and slopes in excess of twenty-five percent in grade, should be left as open space to eliminate mass grading.

Consolidate and Locate Utility Lines to Avoid Scenic Areas: Wherever feasible, power and pipe utility lines should be consolidated to prevent further severance of open space lands. Utility lines and aqueducts in open space areas should be located so as to avoid areas of outstanding beauty.

Natural Resources within Open Space Areas Should be Permanently Protected: Within open space areas, either publicly or privately owned, removal of mature trees should not be permitted without the permission of the local authority. Alteration of streambeds or bodies of water and adjacent vegetation should be permitted only as a means of erosion-control or flood control, as permitted by the adopted plans of regional or local jurisdictions, and in such a manner as to enhance water courses, scenic shorelines, and wetlands within the county.

East County Area Plan

The project site falls within the *East County Area Plan* (ECAP). The following goals and policies of the ECAP are applicable to the project (Alameda County 2000).

Sensitive Viewsheds

Goal: To preserve unique visual resources and protect sensitive viewsheds.

Policy 105: The County shall preserve the following major visually-sensitive ridgelines largely in open space use:

1. The ridgelines of Pleasanton, Main, and Sunol Ridges west of Pleasanton;
2. The ridgelines of Schafer, Shell, Skyline, Oak and Divide Ridges west of Dublin and the ridgelines above Doolan Canyon east of Dublin;
3. The ridgelines above Collier Canyon and Vasco Road and the ridgelines surrounding Brushy Peak north of Livermore;
4. The ridgelines above the vineyards south of Livermore;
5. The ridgelines above Happy Valley south of Pleasanton.

Policy 106: Structures may not be located on ridgelines or hilltops or where they will project above a ridgeline or hilltop as viewed from public roads, trails, parks and other public viewpoints unless there is no other site on the parcel for the structure or on a contiguous parcel in common ownership on or subsequent to the date this ordinance becomes effective. New parcels may not be created that have no building site other than a ridgeline or hilltop, or that would cause a structure to protrude above a ridgeline or hilltop, unless there is no other possible configuration.

Policy 107: The County shall permit no structure (e.g., housing unit, barn, or other building with four walls) that projects above a visually-sensitive major ridgeline**.**

Policy 108: To the extent possible, including by clustering if necessary, structures shall be located on that part of a parcel or on contiguous parcels in common ownership on or subsequent to the date this ordinance becomes effective, where the development is least visible to persons on public roads, trails, parks and other public viewpoints. This policy does not apply to agricultural structures to the extent it is necessary for agricultural purposes that they be located in more visible areas.

Policy 113: The County shall review development proposed adjacent to or near public parklands to ensure that views from parks and trails are maintained.

Policy 114: The County shall require the use of landscaping in both rural and urban areas to enhance the scenic quality of the area and to screen undesirable views. Choice of plants should be based on compatibility with surrounding vegetation, drought-tolerance, and suitability to site conditions; and in rural areas, habitat value and fire retardance.

Policy 115: In all cases appropriate building materials, landscaping and screening shall be required to minimize the visual impact of development. Development shall blend with and be subordinate to the environment and character of the area where located, so as to be as unobtrusive as possible and not detract from the natural, open space or visual qualities of the area. To the maximum extent practicable, all exterior lighting must be located, designed and shielded so as to confine direct rays to the parcel where the lighting is located.

Policy 116: To the maximum extent possible, development shall be located and designed to conform with rather than change natural landforms. The alteration of natural topography, vegetation, and other characteristics by grading, excavating, filling or other development activity shall be minimized. To the extent feasible, access roads shall be consolidated and located where they are least visible from public viewpoints.

Policy 117: The County shall require that where grading is necessary, the off-site visibility of cut and fill slopes and drainage improvements is minimized. Graded slopes shall be designed to simulate natural contours and support vegetation to blend with surrounding undisturbed slopes.

Policy 118: The County shall require that grading avoid areas containing large stands of mature, healthy vegetation, scenic natural formations, or natural watercourses.

Policy 119: The County shall require that access roads be sited and designed to minimize grading**.**

Policy 120: The County shall require that utility lines be placed underground whenever feasible. When located above ground, utility lines and supporting structures shall be sited to minimize their visual impact.

Windfarms

Goal: To maximize the production of wind generated energy.

Policy 169: The County shall allow for continued operation, new development, redevelopment, and expansion of existing and planned windfarm facilities within the limits of environmental constraints.

Policy 170: The County shall protect nearby existing uses from potential traffic, noise, dust, visual, and other impacts generated by the construction and operation of windfarm facilities.

Streets and Highways

Goal: To complete County-planned street and highway improvements which are attractively designed to integrate pedestrian and vehicle use.

Policy 198: The County shall allow reductions in roadways widths in areas of complex topography, sensitive resources, or scenic value.

Scenic Highways

Goal: To preserve and enhance views within scenic corridors.

Policy 215: The County shall manage development and conservation of land within East County scenic highway corridors to maintain and enhance scenic values.

3.1.2.2 Environmental Setting

Regional Character

The APWRA is in an unincorporated rural part of Alameda County, in the northeastern corner of the county near the western boundary of San Joaquin County and the southern boundary of Contra Costa County. The APWRA extends approximately one third of a mile south of Tesla Road on the eastern side of the Altamont Hills, and approximately 2 miles south of the project site. However, the area south of the project site within the APWRA has not been developed with wind turbines since the APWRA was designated for wind energy development in the 1980s.

The topography of the APWRA is characterized by grass-covered, rounded hills and smooth contours, much of which serves as cattle grazing land. Some portions of the APWRA contain steep slopes and long ridges. A broad, flat expanse of the San Joaquin Valley lies to the northeast and east, as well as the communities of Mountain House and Tracy. The Delta lies northeast of the region. The hills are generally steeper and higher to the west and south within the APWRA, with milder slopes and lower elevations toward the northeast. The APWRA's principal visual character was historically established in the 1980s by the development of hundreds of small turbines across its ridges and hilltops. Other prominent features are road and railroad cuts, scattered rural residential homesites, farm complexes, a few industrial operations, and a number of long-distance electrical transmission corridors. The Altamont Landfill occupies a large area within the APWRA, about 3 miles northwest of the project site, but is generally out of sight from public view due to its placement away from and above Altamont Pass Road and I-580.

The rolling terrain and prominence of hundreds of old generation turbines that lined most of the horizons resulted in a unique visual experience for viewers on designated scenic routes, shown in Figure 3.1-1, and from other roadways. The PEIR described the old generation turbines as having some visual appeal, but also as negative features that densely populated the hillsides, hilltops and ridges, and compromised the visual integrity of the landscape. The PEIR also acknowledged some areas in the APWRA that are not presently developed with wind turbines or other industrial uses, to the south of I-580, where trees are more prominent and that has more rugged, steeper slopes, south and west of the project site, but within the APWRA.

Project and Vicinity Character

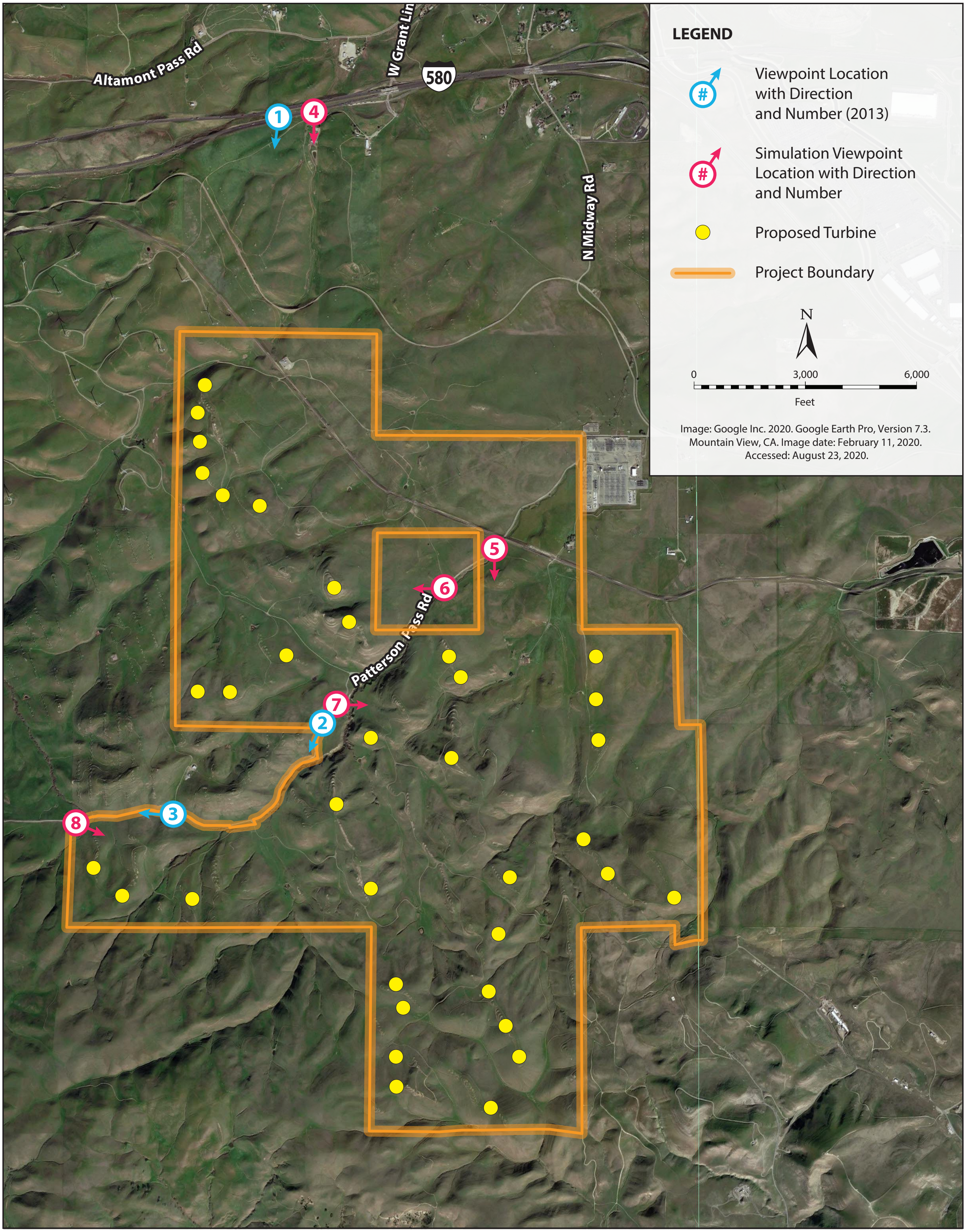
The project vicinity is defined as the area within 0.5 mile of the project site, which is shown in Figure 3.1-1 within the overall APWRA area along with its adjacent scenic routes, trails, and major regional features. As shown, the project site directly abuts the San Joaquin County line to the east and I-580 lies just over a mile to the north and two miles east of the site. The Delta-Mendota Canal also lies to the east, just beyond I-580. Tesla Road is located just over 1.5 miles to the south of the project site. Patterson Pass Road, which is an Alameda County scenic route and part of the Juan Bautista de Anza National Historic Trail auto route, travels through the project site. Patterson Pass Road connects directly from Mountain House Parkway in Tracy to Greenville Road on the east side of Livermore, and is very narrow in some segments, with no dividing line. Nonetheless, it is used by commuters periodically when I-580 is severely congested during peak hours. The PG&E Tesla substation (referred to as the Midway substation in the PEIR) is located just outside of the northeastern corner of the project site. In addition, the Union Pacific Railroad (UPRR) that is used by the Altamont Corridor Express (ACE) commuter rail line travels through the northern portion of the project site. Figure 3.1-2 depicts the overall project site and the locations of photos taken of the project site, including those locations for which photo simulations were prepared. Figures 3.1-3 through 3.1-5 show the project site as it was in 2013 with the old generation turbines. Figures 3.1-6 through 3.1-10 show the simulations prepared to illustrate proposed project impacts and include views of existing conditions in this vicinity as of 2020 without the old generation turbines.

Similar to the greater region of the APWRA, the natural environment of the project site and vicinity is mostly characterized by grass-covered, rolling hills, with road cuts to accommodate its rural roads and I-580. The rolling hills in the northeastern portion of the APWRA are predominantly around 200 to 400 feet in height, marked by many small valleys and drainages, whereas the project site has hills and ridges of 600 to 1,000 feet in elevation, so is somewhat distinctive as viewed from I-580 or the lower elevations in the northeastern parts of the site, along Patterson Pass Road west of Midway Road. The majority of the project site is on the lower slopes of the hills on the southern horizon as viewed from I-580, some of which are still higher than the project parcels, around 1,700 to 2,000 feet in elevation. Although as noted above a 0.4-mile segment of I-580 is designated as a state scenic corridor, views to the west into Alameda County, and south toward the project site from this segment have very marginal quality due to two closely parallel high-tension transmission power lines and pylon towers crossing the segment on a north-south (perpendicular) axis. Better quality views that appear to be worth protecting in this state scenic route segment are in the eastbound direction, facing the wide open Central Valley, as a contrast to the Altamont Hills. Views of the hillsides vary, seasonally, when the grasses on the hillsides change from green to brown. There are no recreational and preserve areas or established recreational foot or bicycle trails in or near the program area with views of the project site. However, as discussed above, Patterson Pass Road through the site is a designated auto-based recreational route with views of the project site, and bicyclists also use the roadway for recreation, as it is designated in the County's Bicycle and Pedestrian Master Plan as a planned Class III bicycle route (Alameda County 2019).

The cultural environment consists of visually distinct artificial features that are located throughout the project site and vicinity that consist of single-poled and large lattice steel transmission lines that dominate the foreground and middleground of the existing viewsheds from local roadways such as Patterson Pass and Midway Roads. In addition, wind turbines of various sizes can be seen in middle-ground views from Midway Road, to the west of the project site. The project site was also occupied by 518 old generation wind turbines that were all decommissioned and removed in 2016, which represents the visual baseline of the PEIR. Therefore, while these features are no longer present and part of the existing conditions associated with the project site since 2016, they form some of the historical context for the views in the region. The Patterson Pass Wind project area, which was approved for repowering in 2014 directly west of the project site on the north side of Patterson Pass Road, still contains an estimated 200 old generation turbine towers, most with their nacelles and blades in place. Although that project is not actively being repowered at the present time, roughly 100 of more than 300 turbines have been removed since 2014, and the remainder are expected to be removed in the near future. Other features include scattered rural residences and ranching and support complexes, together with other power lines, transformers, access roads, and substations.

Views of the project site are generally characterized as long-distance, wide open views from portions of Midway and the eastern portion of Patterson Pass Roads, due to the open landscape and lack of intervening vegetation or terrain north and east of the site. Some views from these roadways are dominated by the cultural (or built) environment and the presence of single-poled and large lattice steel transmission lines, the PG&E Tesla substation, wind turbines, fencing, roadway signs, and the UPRR. The Tesla substation borders Patterson Pass Road on one side for over 1,700 feet. Views from Patterson Pass Road further west are limited to the immediate foreground by roadside terrain that prevents views into the interior of the project site. Views from Patterson Pass Road are dominated by the natural environment; barbed wire fencing with wooden posts and a limited amount of roadway signage represent the only cultural elements visible from the roadway within the project site. Other cultural or human-built elements include single, wooden-poled overhead utility wires along Patterson Pass Road. In addition to views available from Midway and Patterson Pass Roads, public views toward the site are also available to ACE rail commuters traveling along the UPRR that travels through the north site. Views available to ACE rail commuters would be similar to those provided via Midway Road. Overall, as with other areas of the APWRA, the project environment consists of a mixture of visual appeal associated with the characteristic natural environment and the adjacent, intervening artificial structures associated with the cultural environment that detract from the overall cohesion and attractiveness of the area.

In general, most foreground and middleground views from scenic routes and recreational facilities against which the project is evaluated in this SEIR are of grasslands and rangeland. While most of the area had dense rows of turbines across ridgelines since the 1980s as shown in Figures 3.1-3 through 3.1-5, all turbines on the project site were removed by 2016, before the Notice of Preparation for this SEIR was circulated. However, as noted above, many smaller turbines remain visible in the project vicinity outside of the project site (west of its central portion), and though they are faintly visible from I-580, they are not part of the long-term visual context.



Graphics ... 00349.20 (11-2-2020)

ICF

Figure 3.1-2
Visual Simulation Viewpoint Locations

Figure 3.1-3
Viewpoint 1—Looking South from Interstate 580 from 1 Mile West of the Grant Line Road Overpass (2013)

Graphics … 00349.20 (11-2-2020)

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Figure 3.1-4
Viewpoint 2—Looking Southwest along Patterson Pass Road from 2.6 Miles West of Midway Road (2013)

Figure 3.1-5
Viewpoint 3—Looking West along Patterson Pass Road from 4.5 Miles West of Midway Road (2013)

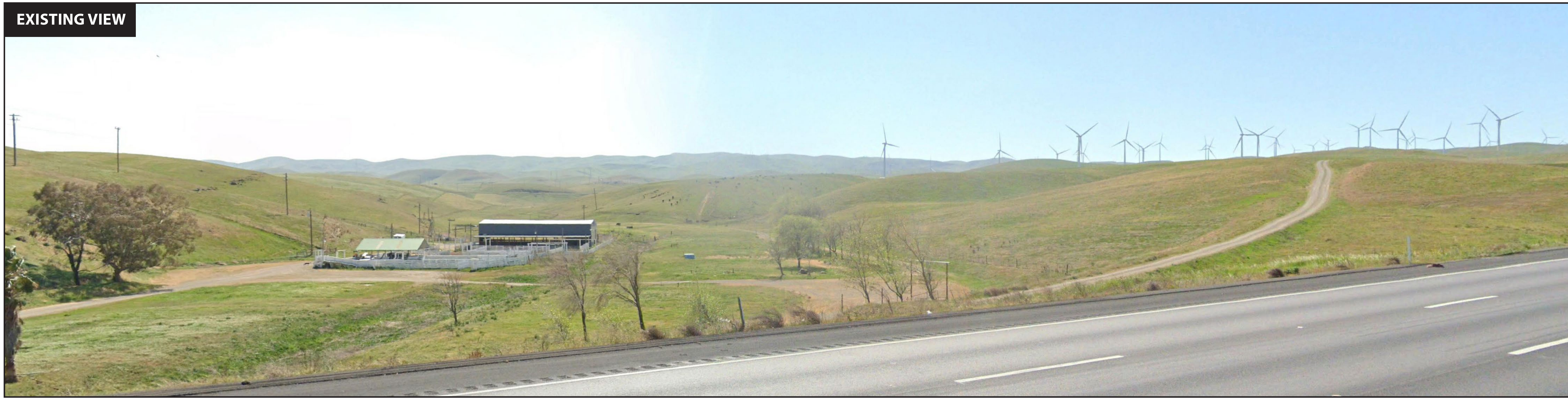

Image Source: Google 2020

Graphics ... 00349.20 (11-2-2020)

Figure 3.1-6
Viewpoint 4—Looking South from Interstate 580 from 0.4 Mile West of the Grant Line Road Overpass

Image Source: Google 2020

Graphics … 00349.20 (11-2-2020)

Figure 3.1-7
Viewpoint 5—Looking South from Patterson Pass Road from 1.25 Miles West of Midway Road

Image Source: Google 2020

Figure 3.1-8
Viewpoint 6—Looking West along Patterson Pass Road from 1.5 Miles West of Midway Road

Image Source: Google 2020

Figure 3.1-9
Viewpoint 7—Looking East along Patterson Pass Road from 2.5 Miles West of Midway Road

Image Source: Google 2020

Figure 3.1-10
Viewpoint 8—Looking East-Southeast from Patterson Pass Road from 5 Miles East of Greenville Road

Existing Viewer Groups and Viewer Responses

The following discussion of existing viewer groups and viewer responses is applicable to the project.

Residents

A few rural residences are scattered near the project site, particularly off Midway Road, though with a few along Patterson Pass Road, also outside and to the east of the site in San Joaquin County. These residences tend to be mostly single-family, rural homes on large land parcels. The views of most residents in the program area consist of smooth, grass-covered, rolling hills, transmission lines and towers and turbine strings that have characterized a majority of the program area for over three decades. Residents would be expected to have the highest sensitivity to visual changes in the project areas because of their familiarity with the view, their investment in the area, and their sense of ownership of the view. Residents who occupy parcels leased for wind generation facilities would be expected to have the lowest level of sensitivity to change because these landowners have agreed to lease the site for wind energy generation purposes and would therefore be more accepting of related visual changes.

Roadway Users

Motorists may use roadways in the project vicinity for commuting and hauling or for more recreational uses, such as sightseeing on scenic roadways. Roadways traversing the project vicinity includes the high-speed I-580 and the lower-speed, two-lane local roadways that wind through the rolling landscape. Motorists' views range from smooth, grass-covered, rolling hills dominated with turbine strings to steep ridges and ravines with no artificial structures. Although more numerous than residents, motorists on I-580 would generally be less sensitive to visual changes in the project area because of the shorter duration of their exposure to the views, the focus of their attention on driving and the roughly 1-mile distance of the nearest proposed turbine site. Therefore, freeway motorists are considered to have limited visual sensitivity. However, motorists on Patterson Pass and Midway Roads would have higher sensitivity to changes due to the close proximity of the project site in the foreground and middleground distance and the longer duration of travel on these lower-speed, winding roads.

Recreationists

Recreationists include cyclists and motorists on Patterson Pass Road (also designed as the Juan Bautista de Anza auto route) and Midway Road, the County's rural recreation routes near and through the project site. These recreational viewers are considered to have high visual sensitivity because recreationists tend to highly value views in the Altamont Hills.

3.1.3 Environmental Impacts

This section describes the aesthetics impact analysis for the project. The section describes the methods used to determine the impacts of the project, lists the thresholds used to conclude whether an impact would be significant, and identifies impacts that would result from project implementation. The section also specifies measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts.

3.1.3.1 Methods for Analysis

The project-level analysis was based on review of the PEIR and on the visual photo simulations prepared for the project. The locations of the key views used for the simulations are identified in Figure 3.1-2, photos of the site as it was in 2013 are presented in Figures 3.1-3 through 3.1-5, and the photo simulations are presented in Figures 3.1-6 through 3.1-10.

3.1.3.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines (updated 2020), the proposed project would be considered to have a significant visual or aesthetic effect if it would result in any of the conditions listed below.

- A substantial adverse effect on a scenic vista.
- Substantial damage to scenic resources, including but not limited to trees, rock outcroppings, and historic buildings along a state scenic highway.
- In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings.
- Creation of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

It should be noted that the third condition is different from the third criterion used in the PEIR, which is due to revised State CEQA Guidelines adopted in 2018, that distinguished *public* views of a site and its surroundings as the aesthetic condition that is subject to potential degradation. By omission, views from exclusively private points of view are no longer considered potentially adverse impacts on the character or quality of aesthetic or visual conditions. The 2018 State CEQA Guidelines revision also separated urbanized and non-urbanized areas, such that only conflicts with zoning or other local regulations that govern scenic quality are deemed to be potentially significant. However, because the PEIR evaluated impacts on both public (e.g., motorist) and private (e.g., resident) views, the analysis in this SEIR conservatively applies the PEIR threshold to determine whether impacts disclosed in the PEIR, that program activities could degrade visual character or quality experienced by residents or employees of area businesses, would also result under the proposed project.

3.1.3.3 Impacts and Mitigation Measures

Project Impacts

Impact AES-1: Potential to have a substantial adverse effect on a scenic vista (less than significant with mitigation)

Temporary Visual Impacts Caused by Construction Activities

The PEIR concluded that construction activities associated with the repowering program could result in significant temporary impacts on scenic vistas, particularly for highly sensitive viewers such as residents and recreationists. The analysis specifically called out Bethany Reservoir and scenic roadways and recreation trails such as the California Aqueduct Bikeway, as well as the trail system around Brushy Peak, the Carnegie State Vehicular Recreation Area and the potential future

Tesla Regional Preserve that could be developed, the latter two of which are in the southern portion of the program area. Although the project site is not visible from Bethany Reservoir or the California Aqueduct Bikeway, several of the southernmost turbines would be visible from the upper elevations of the Carnegie and Tesla sites, which lie about 2 miles south of the site. However, the only construction activity that would be visible would be crane activity for raising the turbine towers and components, and at a distance of over 2 miles the effect would be very limited.

Construction of the project is expected to last approximately 7 months. In general, views of construction activities and equipment, though temporary, could be adverse and disturbing to residents and roadway users in the project area, and, if used, high-powered construction nighttime lighting could be perceived as significant and adverse by area residents. Additional discussion of the visual impacts of construction activities in the PEIR (Impacts AES-1a-1 and AES-1a-2) is incorporated here by reference. Temporary construction impacts of the project would be similar to those described in the PEIR. Thus, the highly sensitive viewers in the project area (residents and recreationists) could be adversely affected by construction activities. This impact would be potentially significant. Implementation of PEIR Mitigation Measure AES-1 would reduce this impact to a less-than-significant level.

Long-Term Impacts

There are no formally designated scenic vistas in the project area or vicinity. However, the PEIR analysis of the repowering program and the two projects evaluated at the project level (the Golden Hills and Patterson Pass projects) addressed scenic vistas available from local roadways and recreational trails. The analysis of the program indicated that new turbine structures located on ridges in the program area that were specifically identified for protection in the ECAP by Policy 105 would constitute a significant adverse visual impact, especially if they were located in areas that had not previously been developed with wind turbines or where turbines did not exist at the time the PEIR was being prepared (formally when the PEIR Notice of Preparation was circulated in 2010). Although these sensitive ridgelines and hilltops as referenced in Policy 105 are outside of the project area, as shown on Figure 3.1-1 (e.g., Brushy Peak and ridgelines along Patterson Pass and Vasco Roads), a number of scenic vistas are available from the local Patterson Pass and Midway Roads, out and over the project site, which are protected by ECAP Policies 170 and 215, as discussed in the PEIR analysis of the program alternatives. Policies 106, 113, 114, 115, 169, and 170, also described above and in the PEIR, provide additional guidance on the assessment of aesthetic impacts. Policy 106 disallows structures in general if they project above ridgelines and hilltops when viewed from public roads, trails, parks, or public viewpoints unless there is no other location on the site for a permitted structure. In the case of the proposed wind turbines, there is no feasible location where they would not project above some hilltops and ridgelines where they would be placed. Policy 113 also directs the County to ensure that views from parks and trails are maintained when reviewing development proposals on adjacent lands. There are no parklands adjacent to the project site, but the Carnegie State Vehicle Recreation Area trails would have views of the turbines, though at a distance of over 2 miles. Additionally, if trails are developed in the Tesla Regional Preserve, recreational users would also have views of the new turbines, where the smaller early generation turbines would have been almost entirely out of sight over the intervening ridges.

The analysis of program impacts on scenic vistas in the PEIR concluded that in areas with existing older turbines, or where they had been in large numbers at the time of the Notice of Preparation for the PEIR in 2010, the replacement of the many existing smaller and older turbines with proportionally far fewer and less intrusive fourth-generation turbines would be less than significant because it would serve ECAP Policies 170 and 215, and otherwise serve to protect and enhance scenic values. The PEIR also concluded that constructing new turbines where no turbines currently exist the impact could be significant. The PEIR discusses scenic routes identified in the County's Scenic Route Element of its General Plan, including Patterson Pass Road, and views from recreational areas and trails as sensitive to new development of wind turbines. The PEIR analysis focused on the potentially significant adverse impacts of new turbines on ridgelines and hilltops where no turbines are present, and also discussed views from recreational areas and trails that may be potentially and adversely affected by the construction of new turbines. Most notably, the PEIR observed that portions of many local roads in the program area, including Patterson Pass Road through the project site, may not provide views of currently existing turbines, but that the impact of new turbines bordering these roadway segments would not be adverse due to motorists being accustomed to the prominence of wind turbines in the general area. The history of turbines in the vicinity and the nearby repowered project to the west (the Golden Hills Wind project) contribute to a finding that the impact of the project on existing views along Patterson Pass or Midway Roads would not be adversely affected. The impact on views from trails south of Tesla Road would be less than significant due to the distance and related small proportion of the total horizon that would be affected.

Comparable to the project-level analysis provided in the PEIR of the Golden Hills project, it is recognized that within the Mulqueeney Ranch project vicinity, many views, as shown in the existing conditions Viewpoints 5 through 7 in Figures 3.1-7 through 3.1-9, currently do not include wind turbines. Although the project site is not currently developed with wind turbines, the site had several hundred turbines at the time the PEIR was published and up until 2016, and as reflected in photos taken of the project site as it was in 2013 (Figures 3.1-3 through 3.1-5). In addition, the project site is part of the area designated by the County as the wind resource area and was intended to be repowered as is currently proposed. In addition, as shown in Viewpoint 8 in Figure 3.1-10, the new turbines would be widely spaced compared to the concentration and density of existing, older turbines and the spacing of the proposed turbines would detract much less from the natural landscape than the existing string configuration within this view. Consistent with the PEIR analysis, the wider configuration of turbines allows for views of the rolling, grassy terrain to become more prominent, back-dropped against the sky, and less interrupted by anthropogenic features. While the larger turbines would draw viewers' attention toward them, the eye is also able to follow the ridgeline of the hills in a more cohesive manner than when turbines are placed more closely together. From some vantages, as seen in Viewpoint 4 in Figure 3.1-6, the proposed turbines in the distance would appear to be a visual continuation of the existing turbines that are located closer to I-580 northwest of the project site (the Golden Hills Wind project).

The hub height of first- and second-generation turbines ranges from 18 to 55 meters (approximately 59 to 180 feet) and third-generation range from 41 to 68 meters (approximately 134 to 223 feet). The proposed fourth-generation project hub heights would be from 80 to 86 meters (262 to 282 feet) and thus between 30 and 68 meters (98 to 223 feet) taller than the largest first- and second-generation turbines previously located in the program area and on the project site. In addition, the rotor blade lengths of fourth-generation turbines are considerably longer (about 60 to 68 meters, or 197 to 223 feet) than those used in the first- and second-generation turbines (about 7.5 to 9 meters, or 25 to 30 feet). Although the hub heights for the project are typical of fourth-generation land-based turbines, the rotor lengths could be moderately longer than those evaluated in the PEIR, up to 68 meters (223 feet), which represents a roughly 7 percent increase. However, it is not expected that the moderate increase in rotor length over those turbines that are now in place could be distinguished by most people and therefore the total turbine height and blade length would not by itself be considered to result in more severe visual impacts compared to the turbines that were under consideration in the PEIR.

As stated in the PEIR, views of the proposed turbines may be more or less prevalent depending on a viewer's location within the landscape and if the viewer has more direct views of the turbines or views that are partially or fully screened by topography. However, all of the proposed turbines are within views that had turbines in place from the 1980s up until 2016, when the old generation wind turbines and towers on the project site were decommissioned and removed. As described above, the project site is in a state- and County-designated wind resource area and was intended to be repowered as is currently proposed, making the development of the site with new current-generation turbines part of the anticipated and customary visual conditions. Therefore, a substantial adverse effect on a scenic vista would not result from installation of new turbines at the project site, and no mitigation is required except to address construction site and long-term maintenance. Although the southernmost proposed turbines, especially those at elevations of more than 1,400 feet, would be visible from existing and planned park and trail areas south of Tesla Road, the distance of more than 2 miles indicates the impact would be less than significant, or effectively mitigated by distance. Even though PEIR Mitigation Measure AES-2a applies only to turbines on ridges that had not previously been developed with commercial-scale wind turbines, and the project site was developed with such wind turbines, including many at these uppermost elevations, AES-2a also establishes in effect a general threshold of 2,000 feet as a distance by which the impact of new turbines visible from public view points would be self-mitigated.

Lastly, 2020 Updated PEIR Mitigation Measure BIO-11i, *Implement an avian adaptive management program*, from Section 3.4, *Biological Resources*, includes potential measures that could consist of painting blades with staggered stripes or painting one blade black. If implemented, this may make turbine blades slightly more visible in scenic vista views when the turbines are lit from the front or from above by the sun, such as from the late morning to afternoon. However, when blades are backlit and silhouetted against the sky, such as in the early morning and evening, this painting is less likely to be visible in scenic vista views. Although the turbines may be slightly more visible when painted, the environmental offset of reducing avian mortality by as much as 70 percent would outweigh the visual impact associated with the blades being somewhat more visible in the landscape. In addition, public support for reducing avian mortality is likely to result in a positive viewer response toward such a visual change, compared to the traditional look of having blades being all one color. Therefore, implementing blade painting measures as described in 2020 Updated PEIR Mitigation Measure BIO-11i is not anticipated to negatively affect the scenic vista views associated with the proposed project to a greater degree than if the blades would be all one color.

A significant impact on scenic vistas could still occur if the project site is not maintained in an orderly fashion, causing it to accumulate debris and resulting in haphazard visual conditions if surplus parts and materials become strewn about the site. Mitigation Measures AES-2b and AES-2c would mitigate this potential impact to a less-than-significant level.

PEIR Mitigation Measure AES-1: Limit construction to daylight hours

Major construction activities will not be undertaken between sunset and sunrise or on weekends. Construction activity is specifically prohibited from using high-wattage lighting sources to illuminate work sites after sunset and before sunrise, with the exception of nighttime deliveries under the approved transportation control plan or other construction activities that require nighttime work for safety considerations.

PEIR Mitigation Measure AES-2b: Maintain site free of debris and restore abandoned roadways

Project sites will be cleaned of all derelict equipment, wind turbine components not required for the project, and litter and debris from old turbines and past turbine operations. Such litter and debris may include derelict turbines, obsolete anemometers, unused electrical poles, and broken turbine blades. In addition, abandoned roads that are no longer in use on such parcels will be restored and hydroseeded to reclaim the sites and remove their visual traces from the view-scape, except in cases where the resource agencies (U.S. Fish and Wildlife Service and California Department of Fish and Wildlife) recommend that the features be left in place for resource protection. All parcels with new turbines will be maintained in such a manner through the life of project operations and until the parcels are reclaimed in accordance with the approved reclamation plan.

PEIR Mitigation Measure AES-2c: Screen surplus parts and materials

Surplus parts and materials that are kept onsite will be maintained in a neat and orderly fashion and screened from view. This can be accomplished by using a weatherproof camouflage material that can be draped over surplus parts and materials stockpiles. Draping materials will be changed out to accommodate for seasonal variations so that surplus materials are camouflaged in an effective manner when grasses are both green and brown.

Impact AES-2: Potential to substantially damage scenic resources along a scenic highway (less than significant with mitigation)

County-designated scenic roads and highways in the project vicinity are shown on Figure 3.1-1 and include Patterson Pass Road, Midway Road, and I-580. The PEIR discusses scenic routes identified in the County's Scenic Route Element of its General Plan, including Patterson Pass Road, and views from recreation areas and trails as sensitive to new development of wind turbines. The emphasis of the PEIR discussion was on the potentially significant adverse impacts that could result in the event of construction of new turbines on ridgelines and hilltops where no turbines are present or where they did not exist at the time the PEIR was being prepared. In the case of the current proposal, almost all of the project site contained turbines at the time the PEIR was prepared. Photos of the project site with the old generation turbines as of 2013 are shown in Figures 3.1-3 through 3.1-5.

Because Patterson Pass Road and I-580 were lined with previously existing turbines until those turbines were recently removed, motorists on these routes are accustomed to views of turbines. Although the new, more efficient turbines would be substantially taller than the previously existing turbines, the new widely spaced configuration would detract less from the natural landscape than did the previously existing configuration (Figures 3.1-6 to 3.1-10). The proposed configuration would allow for views of the rolling, grassy terrain to become more prominent, backdropped against the sky, and less interrupted by anthropogenic features. Although the larger turbines would draw viewers' attention toward them, the eye would be able to follow the ridgeline of the hills in a more cohesive manner.

From some vantages, as seen in Viewpoint 4 in Figure 3.1-6, the proposed turbines in the distance would appear to be a visual continuation of the existing turbines that are located closer to I-580.

Although no turbines currently exist within the project site, it is in a County-designated wind resource area and was intended to be repowered as is currently proposed, making the development of the site with turbines part of the expected visual conditions seen from Patterson Pass Road and I-580. The tiering of the SEIR under the PEIR means that if the changed circumstances since 2014 when the PEIR was certified, such as the removal of old generation turbines and the passage of 4 or 5 years before construction of repowered turbines, was *not* anticipated, the impact of the project could then be significant. However, such removal was anticipated in the PEIR and therefore construction of the new turbines, even after 5 years, would have less-than-significant impacts on scenic resources along a local scenic highway.

As described under Impact AES-1, 2020 Updated PEIR Mitigation Measure BIO-11i from Section 3.4 could include measures such as painting blades with staggered stripes or painting one blade black. This may make turbine blades slightly more visible from scenic routes when the turbines are lit from the front or from above by the sun, such as from the late morning to afternoon. However, when blades are backlit and silhouetted against the sky, such as in the early morning and evening, this painting is less likely to be visible from scenic routes. Although the turbines may be slightly more visible when painted, the environmental offset of reducing avian mortality by as much as 70 percent would outweigh the visual impact associated with the blades being somewhat more visible in the landscape. In addition, public support for reducing avian mortality is likely to result in a positive viewer response toward such a visual change, compared to the traditional look of having blades being all one color. Therefore, implementing the blade painting measures described in 2020 Updated PEIR Mitigation Measure BIO-11i is not anticipated to negatively affect views from scenic routes associated with the proposed project to a greater degree than if the blades would be all one color.

As further described under Impact AES-1, implementation of PEIR Mitigation Measure AES-2a would not be required because the project site has previously been developed with turbines. Significant impacts on scenic roadways could occur if the project site is not maintained in an orderly fashion, causing it to accumulate debris and resulting in haphazard visual conditions if surplus parts and materials become strewn about the site. Implementation of PEIR Mitigation Measure AES-2b and AES-2c would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure AES-2b: Maintain site free of debris and restore abandoned roadways

PEIR Mitigation Measure AES-2c: Screen surplus parts and materials

Impact AES-3: Substantial degradation of the existing visual character or quality of the project site and its surroundings (less than significant with mitigation)

As discussed in Section 3.1.2.2, *Environmental Setting*, the project would primarily be visible to recreationists, area residents and motorists. The County is obligated to comply with measures set forth to protect visual resources along scenic roadways and open space areas identified for protection, as detailed in the Scenic Route and Open Space Elements of the *Alameda County General Plan* (Alameda County 1966). In addition, the County is obligated to comply with policies set forth in the ECAP to protect visual resources, such as sensitive viewsheds, streets and highways, scenic highways, and areas affected by windfarms (Alameda County 2000).

As described above, I-580 and Patterson Pass Road are considered scenic routes. Patterson Pass Road is also used by cyclists for recreation and visitors to the Juan Bautista de Anza auto route, and these viewers are likely to enjoy the views provided from the roadway. In addition, nearby residents would have direct views toward turbines built on the project site. From some vantages, as seen in Viewpoint 4 in Figure 3.1-6, the proposed turbines in the distance would appear to be a visual continuation of the existing turbines that are located closer to I-580. However, as stated in the PEIR, and as illustrated in Viewpoints 5 through 8 in Figures 3.1-6 through 3.1-10, there are portions of these roads where no turbines currently exist. Although no turbines currently exist within the project site, it is in a County-designated wind resource area and was intended to be repowered as is currently proposed, making the development of the project site with turbines part of the expected visual conditions seen by nearby residents and motorists and recreational viewers on roadways surrounding the project site. In addition, motorists and recreational viewers are accustomed to seeing wind turbines along other routes within the project vicinity. Therefore, motorists, recreational viewers, and residents would not be adversely affected by the proposed project. As a result, the construction of new turbines would have less-than-significant impacts on visual character.

As described under Impact AES-1, 2020 Updated PEIR Mitigation Measure BIO-11i from Section 3.4 could include measures such as painting blades with staggered stripes or painting one blade black. This may make turbine blades slightly more visible when the turbines are lit from the front or from above by the sun, such as from the late morning to afternoon. However, when blades are backlit and silhouetted against the sky, such as in the early morning and evening, this painting is less likely to be visible. Although the turbines may be slightly more visible when painted, the environmental offset of reducing avian mortality by as much as 70 percent would outweigh the visual impact associated with the blades being somewhat more visible in the landscape. In addition, public support for reducing avian mortality is likely to result in a positive viewer response toward such a visual change, compared to the traditional look of having blades being all one color. Therefore, implementing blade painting as described in 2020 Updated PEIR Mitigation Measure BIO-11i is not anticipated to negatively affect the exiting visual character or quality of views associated with the proposed project to a greater degree than if the blades would be all one color.

As further described under Impact AES-1, implementation of PEIR Mitigation Measure AES-2a (to require a site development review process) would not be required because the project site has previously been developed with turbines. Significant impacts on the existing visual character and quality of the project site could nonetheless occur if the project site is not maintained in an orderly fashion, causing it to accumulate debris and resulting in haphazard visual conditions if surplus parts and materials become strewn about the site. Implementation of PEIR Mitigation Measure AES-2b and AES-2c would reduce impacts associated with maintenance of the project site to a less-than-significant level.

PEIR Mitigation Measure AES-2b: Maintain site free of debris and restore abandoned roadways

PEIR Mitigation Measure AES-2c: Screen surplus parts and materials

Impact AES-4: Creation of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area (less than significant)

Light and Glare

The PEIR concluded that lighting required by the Federal Aviation Administration (FAA) in the project area and vicinity and lighting associated with the substations would be shielded and directed downward to reduce glare, and that the color of new towers and rotors would be neutral and non-reflective. As described under Impact AES-1, 2020 Updated PEIR Mitigation Measure BIO-11i from Section 3.4 could include measures such as painting blades with staggered stripes or painting one blade black. Painting portions of the blades or an entire blade black would result in an incremental decrease in glare, compared to the blades being all one color. Therefore, implementing blade painting as described in 2020 Updated PEIR Mitigation Measure BIO-11i is anticipated to have a slight beneficial effect in reducing glare than if the blades would be all one, lighter color. Since the preparation of the PEIR, the County has noted that lighting associated with the turbines may have effects beyond those described in the PEIR, as presented in Section 2.1.4, *Proposed Project Characteristics*, in Chapter 2, *Project Description*. First- and second-generation turbines were all under 200 feet in height, and, for this reason, almost no FAA lighting was required. With the addition of FAA-required lighting for the fourth-generation turbines (the repowered Golden Hills and Golden Hills North projects) which were taller, nighttime lighting was not similar in character to the existing facilities, but instead highly noticeable. It is understood that the FAA may have some discretion to not require every turbine to provide nighttime lighting for aesthetic reasons and because the lighting is acknowledged to be an attractant to some birds. Although the PEIR stated that nighttime lighting for repowered turbines would be similar to the lighting of previously existing turbines due to the very substantial reduction in the number of turbines, in fact the new turbines would have lighting mandated by the FAA that differs observably from the lighting used on previously existing turbines due to the physical characteristics—primarily height—of the newer turbines. Because the County does not have the ability to limit the placement of required FAA lighting, and the PEIR established that such lighting at a program level would have a less-than-significant impact, and that conclusion is not subject to change because information about FAA lighting could have been known with reasonable diligence prior to certification of the PEIR, the impacts of FAA lighting requirements at a program level have already been considered and are not further analyzed in this SEIR.

Shadow Flicker

The PEIR also concluded that shadow flicker—caused by blade rotation—could create a disruptive visual intrusion to residents who are within 500 meters (1,640 feet) of a turbine and have the potential to be exposed to shadow flicker for extended periods (i.e., more than 30 minutes in a given day or 30 hours in a given year). There are no residences within 500 meters (1,640 feet) of any turbines associated with the proposed project. As a result, no impacts associated with shadow flicker would occur and no mitigation, including PEIR Mitigation Measure AES-5, is required.

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3.2 Agricultural and Forestry Resources

This section describes the regulatory and environmental setting for agricultural and forestry resources in the project site. It also describes impacts on these resources that could result from implementation of the project.

3.2.1 Existing Conditions

3.2.1.1 Regulatory Setting

Federal

There are no relevant federal regulations for agricultural and forestry resources.

State

Farmland Mapping and Monitoring Program

The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP), administered by the Division of Land Resource Conservation, is responsible for mapping and monitoring Important Farmlands for most of the state's agricultural areas. The FMMP updates its farmland maps every two years based on information from local agencies. FMMP maps show five categories of agricultural lands and three categories of nonagricultural lands, described in the following sections.

Agricultural Lands

Following are descriptions of the farmland mapping categories used by the FMMP. The minimum mapping unit for all agricultural land categories is 10 acres, except for Grazing Land where the minimum mapping unit is 40 acres.

Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are the most suitable for agriculture and are considered especially important agricultural resources. They are often referred to collectively as *important farmland*. Grazing Land may also qualify as important farmland where grazing is a key component of the local economy.

- Prime Farmland is defined by the state as farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Prime Farmland must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
- Farmland of Statewide Importance is defined as "irrigated land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops." However, this land has minor shortcomings, such as steeper slopes or less ability to store soil moisture than Prime Farmland. For land to be designated as Farmland of Statewide Importance, it must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date.

- Unique Farmland is considered to consist of lower-quality soils but nonetheless is used for production of the state's leading agricultural crops. Unique Farmland is usually irrigated, but may include nonirrigated orchards or vineyards in some climatic zones. To qualify for this designation, land must have been used for crops at some time during the 4 years prior to the mapping date.
- Farmland of Local Importance is land identified as important to the local agricultural economy by each county's board of supervisors and a local advisory committee.
- Grazing Land is land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, the University of California Cooperative Extension, and other groups interested in the extent of grazing activities.

Nonagricultural Lands

Following are descriptions of the nonagricultural land mapping categories used by the FMMP. Mapping units for nonagricultural lands vary, as described below.

- Urban and Built-Up Lands consist of land occupied by structures with a building density of at least 1 structure to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This type of land is used for residential, industrial, commercial, construction, institutional, and public administration purposes; railroad and other transportation yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment facilities; water control structures; and other developed purposes.
- Other Land is land not included in any other mapping category. Examples include low-density rural developments and brush, timber, wetland, and riparian areas not suitable for livestock grazing. This category also includes vacant and nonagricultural land surrounded on all sides by urban development; confined livestock, poultry, or aquaculture facilities; strip mines; borrow pits; and water bodies smaller than 40 acres.
- Water includes perennial water bodies with an extent of at least 40 acres.

California Land Conservation Act (Williamson Act)

The Williamson Act is one of the state's primary mechanisms for conserving farmland. It enables counties and cities to designate agricultural preserves (Williamson Act lands) and to offer preferential taxation to private agricultural landowners based on the income-producing value of their property in agricultural use, rather than on the property's assessed market value. In return for the preferential tax rate, the landowner is required to sign a contract with the county or city agreeing not to develop the land for a minimum 10-year period. Contracts are automatically renewed annually unless a party to the contract files for nonrenewal or petitions for cancellation. If the landowner chooses not to renew the contract, it expires at the end of its duration. Under certain circumstances, a county or city may approve a request for cancellation of a Williamson Act contract. Cancellation requires private landowners to pay back taxes and cancellation fees.

Each city and county has the discretion to determine which land uses are compatible with Williamson Act contracts within their jurisdiction, provided these uses are not prohibited under the Act.

California Public Resources Code

Public Resources Code (PRC) Section 12220(g) defines "forest land" as "land that can support 10% native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." PRC Section 4526 defines "Timberland" as "land, other than land owned by the federal government…which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees…."

Local

East County Area Plan

The Land Use Element of the *East County Area Plan* (Alameda County 2000) contains goals, policies, and programs related to Sensitive Lands and Regionally Significant Open Space, including Agriculture. The following goals, policies, and programs are applicable to the project.

Goal: To protect regionally significant open space and agriculture land from development.

Policy 52: The County shall preserve open space areas for the protection of public health and safety, provision of recreational opportunities, production of natural resources (e.g., agriculture, windpower, and mineral extraction), protection of sensitive viewsheds (see definition in Table 1 [of East County Area Plan]), preservation of biological resources, and the physical separation between neighboring communities (see Figure 4 [of East County Area Plan]).

Goal: To maximize long-term productivity of East County's agricultural resources.

Policy 71: The County shall conserve prime soils (Class I and Class II, as defined by the USDA Soil Conservation Service Land Capability Classification) and Farmland of Statewide Importance and Unique Farmland (as defined by the California Department of Conservation Farmland Mapping and Monitoring Program) outside the Urban Growth Boundary.

Policy 76: The County shall work with San Joaquin, Contra Costa, and Santa Clara Counties to ensure that any development adjacent to Alameda County agricultural land mitigates impacts on agricultural land including air quality, water quality, and incompatibilities with agricultural uses. In particular, measures to mitigate growth-inducing impacts of development on agricultural land in Alameda County shall be addressed through cooperative efforts among the counties. The County shall ensure that land uses within Alameda County adjacent to San Joaquin, Contra Costa, and Santa Clara Counties are compatible with adjacent agricultural uses in these other counties.

Program 40: The Zoning Ordinance shall have an "A-160" (Agriculture—160-acre minimum parcel size) District and an "A-320" (Agriculture—320-acre minimum parcel size) District. The "A-160" (Agriculture—160-acre minimum parcel size) District shall cover the following area: the Wind Resource Area (see Figure 4 - Open Space Diagram [of East County Area Plan]), except lands easterly of the California Aqueduct, and lands to the south of Tesla Road that are within one mile of Tesla Road between the San Joaquin County boundary and the South Livermore Valley Plan. The "A-320" (Agriculture—320-acre minimum parcel size) District shall cover lands located generally to the south of the following boundary: parallel to and one mile south of Tesla Road from the San Joaquin County boundary to the South Livermore Valley Plan Area; the southern boundary of the South Livermore Valley Plan Area; parallel to and one mile south of Vallecitos Road from the South Livermore Valley Plan Area to the intersection of the one mile line with the northern boundary of San Francisco Water Department lands surrounding San Antonio Reservoir; the northern boundary of the San Francisco Water Department lands to the north/south section line directly west of San Antonio Reservoir; a line following the north/south section line to its intersection with Calaveras Road; and the northern boundary of the East Bay Regional Park District property located between Calaveras Road and the western boundary of the East County planning area. The Zoning Ordinance shall include "grandfather clauses" to recognize the rights of property owners. Lands rezoned to "A-160" and "A-320" shall maintain the designations shown on the East County Area Plan Land Use Diagram.

Zoning Ordinance (Alameda County Code, Title 17)

The project site is zoned A (Agricultural District). This zoning district protects existing agricultural uses and encourages a wide range of agricultural uses in nonurban areas. Certain nonagricultural uses, including privately owned wind-electric generators, are considered conditional uses and are permitted in an A district if approved by the board of zoning adjustments.

Right to Farm

Alameda County's "Right-to-Farm" ordinance is set forth in Chapter 6.28 of the Municipal Code. This ordinance is designed to promote public health, safety and welfare, and to support and encourage continued agricultural operations in the county. A Right-to-Farm ordinance protects farmland by requiring disclosure to purchasers and users of property next to or near agricultural operations of the inherent potential problems associated with living near actively farmed land.

3.2.1.2 Environmental Setting

The environmental setting for agriculture comprises the location of agricultural lands, the type of crops, the FMMP farmland classifications, and lands designated under the Williamson Act in the program area.

State Farmland Classifications

The majority of the program area (approximately 41,229 acres) is designated as Grazing Land and is primarily used for cattle grazing (California Department of Conservation 2020). Table 3.2-1 presents a summary of agricultural acreage found in the program area in 2016, the most recent year for which data for Alameda County are available. Farmland in the program area is shown on Figure 3.2-1. As shown, the entire project site is designated as Grazing Land.

Table 3.2-1. FMMP Acreage in the Program Area

FMMP Land Cover	Acres
Urban and Built-up Land	1,010.22
Grazing Land	41,229.10
Prime Farmland	23.14
Farmland of Statewide Importance	0.33
Water	169.93
Other Land	937.46
Total	**43,370.21**

Source: California Department of Conservation 2020.

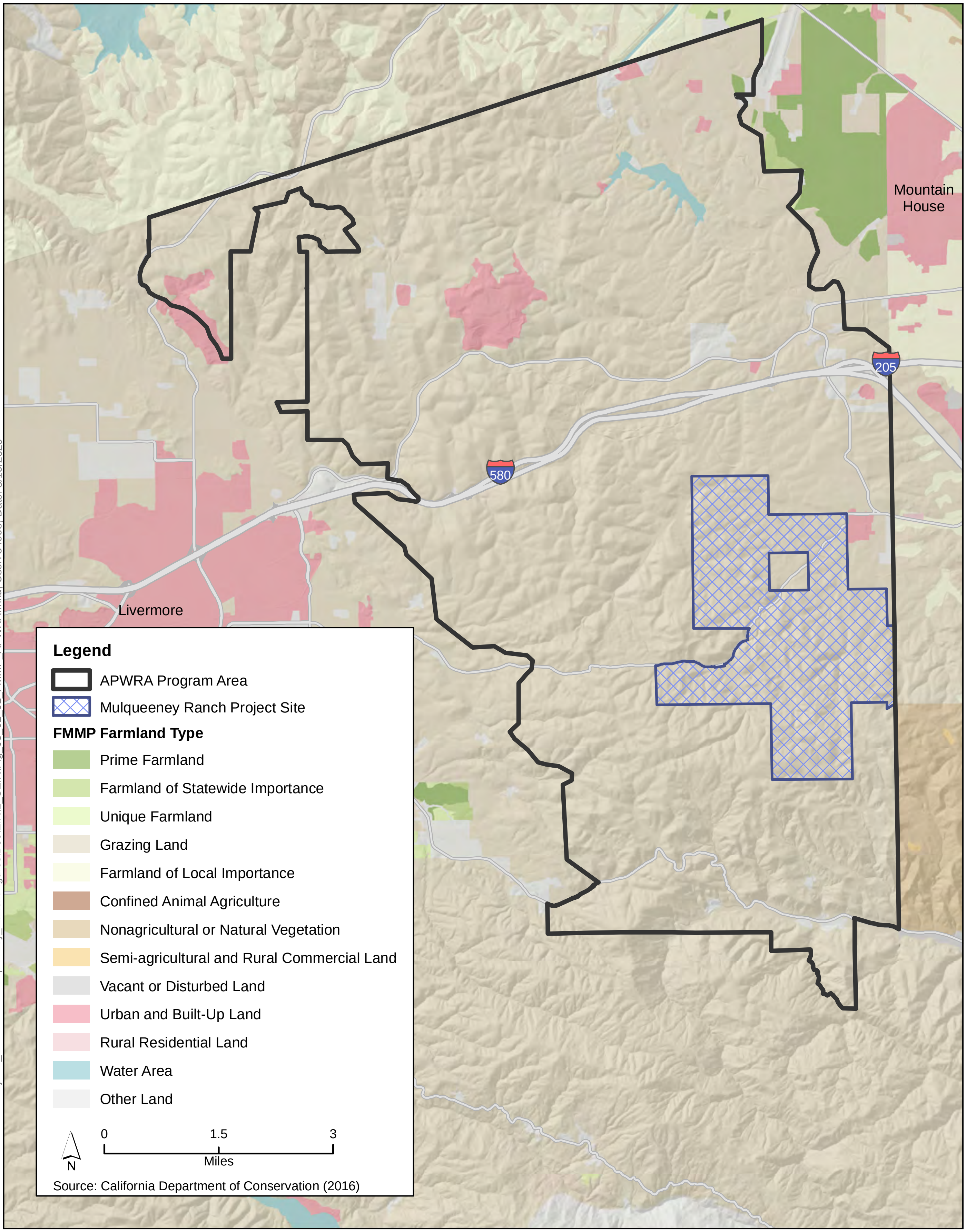

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Figure 3.2-1
Farmland Types in the Program Area

Farmland Conversion

The FMMP also produces a report every 2 years on the amount of land converted from agricultural to nonagricultural use. Table 3.2-2 summarizes recent changes to FMMP-classified agricultural land in Alameda County. The county experienced a net loss of 314 acres of agricultural land from 2014 to 2016, the most recent years for which data for Alameda County are available.

Table 3.2-2. Alameda County Farmland Conversions 2014–2016

	Total Acres Inventoried		2014–2016 Acreage Changes		
Land Use Category	2014	2016	Acres Lost	Acres Gained	Net Change
Prime Farmland	3,432	3,392	94	54	-40
Farmland of Statewide Importance	1,111	1,127	66	82	16
Unique Farmland	2,259	2,153	144	38	-106
Farmland of Local Importance	0	0	0	0	0
Grazing Land	241,170	240,986	709	525	-184
Agricultural Land Subtotal	**247,972**	**247,658**	**1,013**	**699**	**-314**

Source: California Department of Conservation 2020.

Williamson Act Lands

Approximately 137,334 acres of Alameda County farmland were enrolled in Williamson Act contracts in the 2019/2020 fiscal year (Grundy 2020). Figure 3.2-2 shows the Williamson Act parcels in the program area. Approximately 31,420 acres of land under Williamson Act contracts, including the entire project site, are located in the program area. All the Williamson Act-contracted land in the program area is Non–Prime Farmland.

Crops and Livestock

The PEIR states that Alameda County's top five agricultural products in 2011 in terms of value were wine grapes, ornamental trees and shrubs, cattle and calves, range pasture, and hay (Alameda County Community Development Agency 2012). The top agricultural products were similar in 2018 wine grapes, cattle and calves, ornamental trees and shrubs, range and pasture, and miscellaneous fruit and nut products (Alameda County Community Development Agency 2019). The primary crop in the program area, including the project site, was and continues to be pasture and range, which is primarily used for cattle grazing.

Forestry Resources

The Altamont Hills, including the project site, are dominated by grassland and not likely to support 10% native tree cover under natural conditions because the soils, in combination with annual rainfall and other climatic conditions, are not conducive to the specified distribution of oak or other tree species. There are no forestry resources in the program area, including the project site.

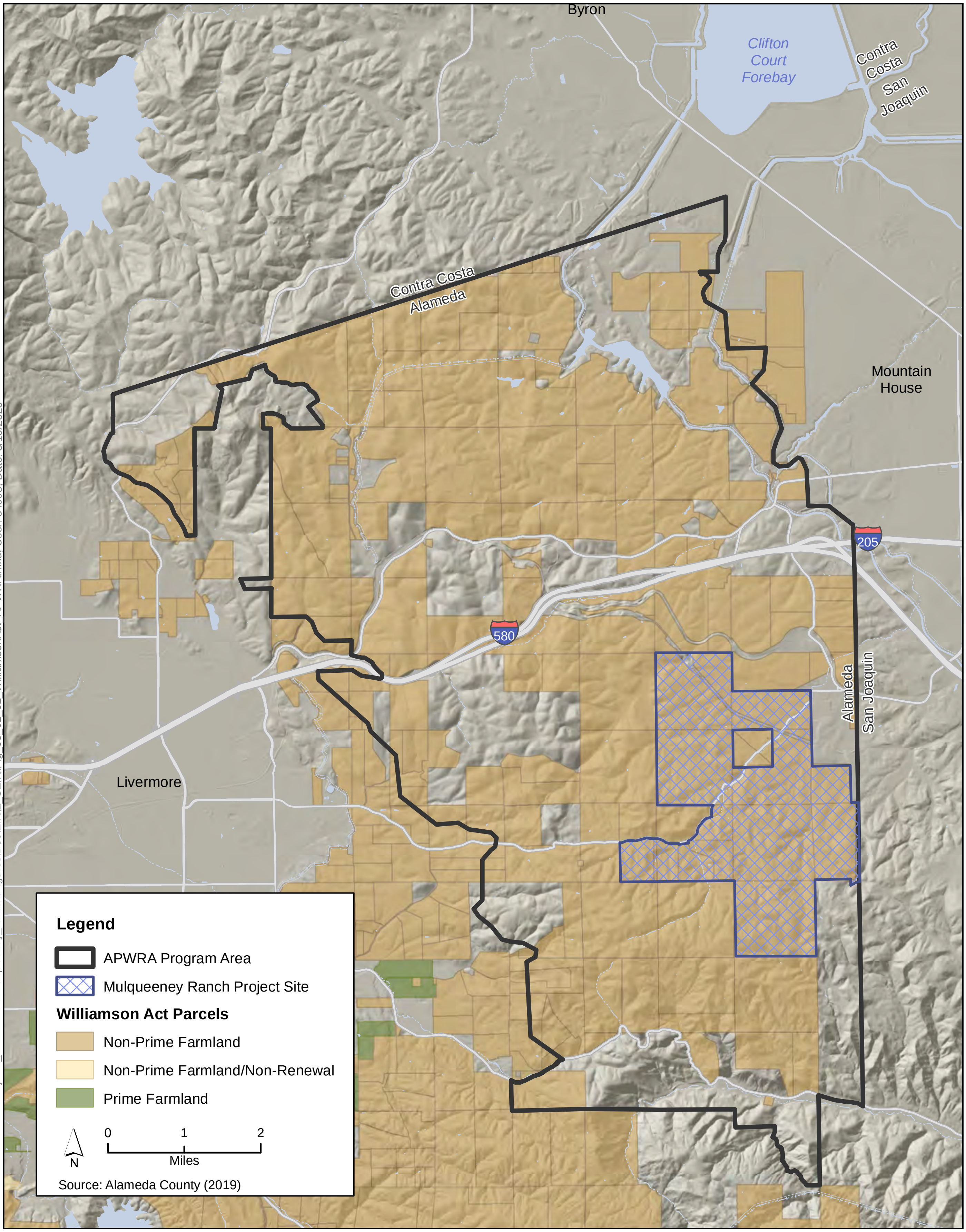

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Figure 3.2-2
Williamson Act Lands in the Program Area

3.2.2 Environmental Impacts

This section presents the impact analysis relating to project effects on agricultural resources. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant.

3.2.2.1 Methods for Analysis

Identifying the impacts on the project site's agricultural resources involved a review of the Alameda County Zoning Map and zoning ordinance and the Alameda County Important Farmland 2016 map.

3.2.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to nonagricultural use.
- Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract.
- Conflict with existing zoning for, or rezoning of forest land (as defined in PRC Section 12220[g]), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]).
- Loss of forest land or conversion of forest land to non-forest use.
- Other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use.

3.2.2.3 Impacts and Mitigation Measures

Project Impacts

Impact AG-1: Conversion of Important Farmland to nonagricultural use (no impact)

The project site is located in the southeastern portion of the program area. As shown in Figure 3.2-1, the only Prime Farmland and Farmland of Statewide Importance in the program area is a small area located in the northeast corner of the program area. The project site is entirely classified as Grazing Land under the FMMP, and existing conditions include ongoing grazing (Figure 3.2-1 and Table 3.2-1). No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Important Farmland) is present within the project site (California Department of Conservation 2020).

The project would require a single temporary construction staging area. Some existing roads would be widened to accommodate construction activities, and some new service roads would be developed. Land would also be used to construct foundations for the new wind turbines. Following completion of construction activities, the contractor would reclaim and restore the temporary construction staging area. The new or widened roads would be retained for operations and maintenance purposes. Because installation of new turbines or associated facilities would not result in the permanent conversion of Prime Farmland or Farmland of Statewide Importance to nonagricultural uses, there would be no impact. No mitigation is required.

Impact AG-2: Conflict with existing zoning for agricultural use or with a Williamson Act contract (no impact)

Chapter 17.06.040 of the Alameda County Code of Ordinances indicates that privately owned wind electric generators are a conditionally permitted use on non-prime farmland within the A District (Alameda County 2019). No prime farmland is present within or near the project site and, as shown in Figure 3.2-2, all the Williamson Act land in the program area is non-prime farmland. Wind turbines are a compatible use allowed under the Williamson Act contracts covering the project site. The replacement of wind turbine towers on land currently under Williamson Act contract would not remove the land from Williamson Act contract status. There would be no impact. No mitigation is required.

Impact AG-3: Conflict with existing zoning of forest land, timberland, or timberland zoned Timberland Production (no impact)

No land zoned as forest land or timberland is located within or in the immediate vicinity of the project site. Accordingly, the project would not conflict with existing zoning, or cause rezoning, of forest land or timberland. There would be no impact. No mitigation is required.

Impact AG-4: Loss of forest land or conversion of forest land to non-forest use (no impact)

No forest land exists in the project site; consequently, the project would not cause the loss or conversion of forest land to non-forest use. There would be no impact. No mitigation is required.

Impact AG-5: Potential to cause changes in the existing environment that could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use (no impact)

No Prime Farmland or Farmland of Statewide Importance is located in the project site. Similarly, because no land in the project site meets the definition of forest land, the project would not result in conversion of forest land to non-forest use. There would be no impact. No mitigation is required.

3.2.3 References Cited

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3.3 Air Quality

This section examines the degree to which the proposed project may result in changes to regional and local air quality. This section also describes the applicable regulatory framework, existing ambient air quality conditions of the project site, and characteristics and effects of air pollutants. The project site is in unincorporated Alameda County, which is formally within the San Francisco Bay Area Air Basin (SFBAAB) and where most of the emissions would be occurring during project construction and operation. Some emissions would be occurring in the San Joaquin Valley Air Basin (SJVAB) due to anticipated transportation of construction equipment and turbine components through San Joaquin County, and due to topographical conditions, in that the project is on the western slopes of the Central Valley and the SJVAB. The impact analysis focuses on the primary pollutants that would be generated by the project, which are ozone precursors [reactive organic gases (ROG) and nitrogen oxides (NO_X)], particulate matter 10 microns or less in diameter (PM10), particulate matter 2.5 microns or less in diameter (PM2.5), and diesel particulate matter (DPM).

3.3.1 Existing Conditions

3.3.1.1 Regulatory Setting

The federal Clean Air Act (CAA) and its subsequent amendments form the basis for the nation's air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the CAA. A key element of the CAA is the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The CAA delegates enforcement of the NAAQS to the states. In California, the California Air Resources Board (CARB) is responsible for enforcing air pollution regulations and ensuring the NAAQS and California Ambient Air Quality Standards (CAAQS) are met. CARB, in turn, delegates regulatory authority for stationary sources and other air quality management responsibilities to local air agencies. The Bay Area Air Quality Management District (BAAQMD) is the local air agency responsible for the project site, with a jurisdiction extending over almost all of the nine Counties associated with the San Francisco Bay Area. The San Joaquin Valley Air Pollution Control District (SJVAPCD) is responsible for regulating air quality in seven Central Valley Counties (and the western portion of an eighth, Kern County), including San Joaquin County, directly east of the project site, and through which most construction equipment and turbine components will be transported. The following sections provide more detailed information on federal, state, and local air quality regulations that apply to the project.

Federal Regulations

Clean Air Act

The federal CAA and its subsequent amendments form the basis for the nation's air pollution control effort. The EPA is responsible for implementing most aspects of the CAA and has established NAAQS for six criteria pollutants—ozone, PM10, PM2.5, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead. The NAAQS identify levels of air quality that are considered the maximum safe levels of ambient (background) air pollutants, within an adequate margin of safety, to protect public health and welfare. Table 3.3-1 shows the NAAQS currently in effect for each criteria pollutant, as well as the CAAQS (discussed further below).

Table 3.3-1. Federal and State Ambient Air Quality Standards

Criteria Pollutant	Average Time	California Standards	National Standards[a]	
			Primary	Secondary
Ozone	1-hour	0.09 ppm	None[b]	None[b]
	8–hour	0.070 ppm	0.070 ppm	0.070 ppm
Particulate Matter (PM10)	24-hour	50 μg/m³	150 μg/m³	150 μg/m³
	Annual mean	20 μg/m³	None	None
Fine Particulate Matter (PM2.5)	24-hour	None	35 μg/m³	35 μg/m³
	Annual mean	12 μg/m³	12.0 μg/m³	15 μg/m³
Carbon Monoxide	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None
Nitrogen Dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide[c]	Annual mean	None	0.030 ppm	None
	24-hour	0.04 ppm	0.014 ppm	None
	3-hour	None	None	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	None
Lead	30-day Average	1.5 μg/m³	None	None
	Calendar quarter	None	1.5 μg/m³	1.5 μg/m³
	3-month average	None	0.15 μg/m³	0.15 μg/m³
Sulfates	24-hour	25 μg/m³	None	None
Visibility-Reducing Particles	8-hour	–[d]	None	None
Hydrogen Sulfide	1-hour	0.03 ppm	None	None
Vinyl Chloride	24-hour	0.01 ppm	None	None

Source: California Air Resources Board 2016.

ppm= parts per million; μg/m³ = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standard; SO_2 = sulfur dioxide; CAAQS = California Ambient Air Quality Standard.

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for State Implementation Plans.

[c] The annual and 24-hour NAAQS for SO_2 only apply for 1 year after designation of the new 1-hour standard to those areas that were previously in nonattainment for 24-hour and annual NAAQS.

[d] CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70%.

Non-Road Diesel Rule

EPA has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and locomotives. New equipment used for activities within the project site, including heavy-duty trucks and off-road construction equipment, would be required to comply with these emission standards.

National Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy Standards (CAFÉ) were first enacted in 1975 to improve the average fuel economy of cars and light duty trucks. On August 2, 2018, the National Highway Traffic Safety Administrative (NHTSA) and EPA proposed to amend the fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). On September 19, 2019, EPA and NHTSA issued a final action on the One National Program Rule, which is consider Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables EPA/NHTSA to provide nationwide uniform fuel economy and greenhouse gas (GHG) vehicle standards, specifically by (1) clarifying that federal law preempts state and local tailpipe GHG standards, (2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and (3) withdrawing California's CAA preemption waiver to set state-specific standards.

EPA and NHTSA published their decisions to withdraw California's waiver and finalize regulatory text related to the preemption on September 27, 2019 (84 *Federal Register* [Fed. Reg.] 51310). California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (*California et al. v. United States Department of Transportation et al*., 1:19-cv-02826, U.S. District Court for the District of Columbia). On October 28, 2019, the Union of Concerned Scientists, Environmental Defense Fund (EDF), and other groups filed a protective petition for review after the federal government sought to transfer the suit to the D.C. Circuit (*Union of Concerned Scientists v. National Highway Traffic Safety Administration*). Opening briefs for the petition are currently scheduled to be completed on November 23, 2020. The lawsuit filed by California and others is stayed pending resolution of the petition.

EPA and NTHSA published final rules to amend and establish national carbon dioxide and fuel economy standards on April 30, 2020 (Part Two of the SAFE Vehicles Rule) (85 Fed. Reg. 24174). The revised rule changes the national fuel economy standards for light duty vehicles from 50.4 mpg to 40.5 mpg in future years. California, 22 other states, the District of Columbia filed a petition for review of the final rule on May 27, 2020. The fate of the SAFE Vehicles Rule remains uncertain in the face of pending legal deliberations.

State Regulations

California Clear Air Act

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. The CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are shown in Table 3.3-1.

CARB and local air districts bear responsibility for meeting the CAAQS, which are to be achieved through district-level air quality management plans incorporated into the State Implementation Plan (SIP). In California, EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of “indirect and area-wide sources” of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures.

Advanced Clean Truck Regulation

CARB adopted the Advanced Clean Truck Regulation in June 2020 to accelerate a large-scale transition of zero-emission medium-and-heavy-duty vehicles. The regulation requires the sale of zero-emission medium-and-heavy-duty vehicles as an increasing percentage of total annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. By 2045, every new medium-and-heavy-duty truck sold in California will be zero-emission. Large employers including retailers, manufacturers, brokers, and others are required to report information about shipments and shuttle services to better ensure that fleets purchase available zero-emission trucks and vehicles.

Statewide Truck and Bus Regulation

Originally adopted in 2005, the on-road truck and bus regulation requires heavy trucks to be retro-fitted with particulate matter filters. The regulation applies to privately and federally owned diesel-fueled trucks with a gross vehicle weight rating greater than 14,000 pounds. Compliance with the regulation can be reached through one of two paths: (1) vehicle retrofits according to engine year or (2) phase-in schedules. Compliance paths ensure that by January 2023, nearly all trucks and buses will have 2010 model year engines or newer.

State Tailpipe Emission Standards

Like EPA at the federal level, CARB has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft operating in California. New equipment used for construction and operation activities would be required to comply with the standards.

Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between CARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program.

Toxic Air Contaminant Regulations

California regulates toxic air contaminants (TACs) primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics “Hot Spots” Information and Assessment Act of 1987 (Hot Spots Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created

California's program to reduce exposure to air toxics. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

CARB has identified DPM as a TAC and has approved a comprehensive *Diesel Risk Reduction Plan* to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce DPM emissions and the associated health risk by 75 percent by 2010 and by 85 percent by 2020. The plan identifies 14 measures that CARB will implement over the next several years. The project would be required to comply with any applicable diesel control measures from the *Diesel Risk Reduction Plan*.

Regional and Local Regulations

At the regional level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met. The project site falls under the jurisdiction of the BAAQMD, but some emissions would occur in areas under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Applicable plans and regulations from the air districts are presented below.

Bay Area Air Quality Management District

The BAAQMD is responsible for ensuring the NAAQS and CAAQS are met within the SFBAAB. BAAQMD manages air quality through a comprehensive program that includes long-term planning, regulations, incentives for technical innovation, education, and community outreach. The *2017 Clean Air Plan* provides an integrated strategy to reduce ozone, PM, and TACs in a manner that is consistent with federal and state air quality programs and regulations. BAAQMD's 2017 *Clean Air Plan* includes a wide range of proposed control measures to reduce combustion-related activities and decrease fossil fuel combustion (Bay Area Air Quality Management District 2017a).

The BAAQMD's *CEQA Guidelines* (2017b) provide guidance for evaluating project-level air quality impacts. The guidelines also contain thresholds of significance for ozone precursors (ROG and NOx), CO, PM2.5, PM10, TACs, and odors. As stated in Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the checklist determinations. The BAAQMD's thresholds, as outlined in its *CEQA Guidelines*, are summarized in Table 3.3-2.

In addition, BAAQMD develops and adopts various rules to reduce emissions throughout the SFBAAB. The project may be subject to the following district rules.

- Regulation 6, Rule 1 (Particulate Matter): This regulation restricts emissions of particulate matter darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- Regulation 7 (Odorous Substances). This regulation establishes general odor limitations on odorous substances and specific emission limitations on certain odorous compounds.
- Regulation 9, Rule 8 (Stationary Internal-Combustion Engines): This regulation limits emissions of NO_X and CO from stationary internal-combustion engines of more than 50 horsepower.

Table 3.3-2. BAAQMD Thresholds of Significance

Pollutant	Construction	Operations
ROG	54 pounds/day	54 pounds/day or 10 tons/year
NO_X	54 pounds/day	54 pounds/day or 10 tons/year
CO	–	Violation of CAAQS
PM10 (exhaust)	82 pounds/day	82 pounds/day or 15 tons/year
PM2.5 (exhaust)	54 pounds/day	54 pounds/day or 10 tons/year
PM10 /PM2.5 (dust)	Best management practices	–
TACs (project-level)	Increased cancer risk of 10 in 1 million; increased non-cancer risk of greater than 1.0 HI; PM2.5 increase of greater than 0.3 micrograms per cubic meter	Same as construction
TACs (cumulative)	Increased cancer risk of 100 in 1 million; increased non-cancer risk of greater than 10.0; PM2.5 increase of greater than 0.8 microgram per cubic meter at receptors within 1,000 feet	Same as construction
Odors	–	Five complaints per year averaged over 3 years

Source: Bay Area Air Quality Management District 2017b.

CAAQS = California Ambient Air Quality Standards; CO = carbon monoxide; HI = hazard index; NO_X = nitrogen oxide; PM 2.5 = particulate matter no more than 2.5 microns in diameter; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases; TACs = toxic air contaminants.

San Joaquin Valley Air Pollution Control District

SJVAPCD has adopted CEQA emission thresholds in its *Guidance for Assessing and Mitigating Air Quality Impacts* to assist lead agencies in determining the level of significance of project-related emissions (San Joaquin Valley Air Pollution Control District 2015a). According to the SJVAPCD guidance, emissions that exceed the recommended threshold levels are considered potentially significant and should be mitigated where feasible. Table 3.3-3 presents SJVAPCD's thresholds for construction and operation.

Table 3.3-3. SJVAPCD Criteria Pollutant Thresholds

Pollutant	Construction	Operations
ROG	10 tons/year	10 tons/year
NO_X	10 tons/year	10 tons/year
CO	100 tons/year	100 tons/year
PM10	15 tons/year	15 tons/year
PM2.5	15 tons/year	15 tons/year
SO_X	27 tons/year	27 tons/year

Source: San Joaquin Valley Air Pollution Control District 2015a.

CO = carbon monoxide; NO_X = nitrogen oxides; PM10 = particulate matter; PM2.5 = fine particulate matter; ROG = reactive organic compounds; SO_X = sulfur oxides.

Under the CCAA, SJVAPCD is also required to develop an air quality plan for nonattainment criteria pollutants in the air district. The air district has adopted attainment plans to address ozone and PM.

The SJVAPCD's guidance also includes screening-level thresholds for construction and operational emissions to help determine when an ambient air quality analysis (AAQA) must be performed. The SJVAPCD's AAQA screening-level thresholds are 100 pounds per day of any criteria pollutant; projects with emissions in excess of this threshold would require dispersion modeling, while projects below this threshold are presumed to not result in a violation of the CAAQS or NAAQS.

Under the CCAA, SJVAPCD is also required to develop an air quality plan for nonattainment criteria pollutants in the air district. The air district has adopted attainment plans to address ozone, and PM. The *2016 Ozone Plan* contains a comprehensive list of regulatory and incentive-based measures to reduce ROG and NO_X emissions. In particular, the plan proposes a 60% reduction in NO_X by 2031 (San Joaquin Valley Air Pollution Control District 2016). SJVAPCD's *2007 PM10 Maintenance Plan* and *2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards* likewise include strategies to reduce particulate matter emissions throughout the air basin. Material hauling through the SJVAB for the project may be subject to the following district rules. This list of rules may not be all encompassing, as additional SJVAPCD rules may apply to the alternatives as specific components are identified. These are rules that have been adopted by SJVAPCD to reduce emissions throughout the SJVAB.

- Rule 4101 (Visible Emissions). This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.
- Rule 4102 (Nuisance). This rule applies to any source operation that emits or may emit air contaminants or other materials. If project hauling activities create a public nuisance, the project could be in violation and subject to SJVAPCD enforcement action.

3.3.1.2 Environmental Setting

This section discusses the environmental setting relevant to air quality. It summarizes how air pollution moves through the air, water, and soil within the relevant air basins and how it is chemically changed in the presence of other chemicals and particles. This section also summarizes local climate conditions, existing air quality conditions, and sensitive receptors that may be affected by the emissions generated by the project.

Climate and Meteorology

San Francisco Bay Area Air Basin

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources. Meteorological and topographical conditions are also important factors. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Air quality is indicated by ambient concentrations of criteria pollutants.

The SFBAAB is defined almost exclusively by the nine Counties that are normally defined as the San Francisco Bay Area and geographically by the Bay itself, inland valleys and Coast Range mountains within these Counties, and some coastal areas. The project site is located approximately 4.5 miles east of the Livermore city limits along Greenville Road, in unincorporated Alameda County, which is within the SFBAAB. The project site is in the extreme eastern portion of Alameda County and the SFBAAB, on the easternmost hills bordering the Central Valley. The SFBAAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During the year, temperatures in Livermore range from 37 degrees Fahrenheit (°F) during the night to 89°F during the day, with occasional daytime temperatures reaching or exceeding 100°F. Average annual rainfall is approximately 14 inches, with roughly 80% of the total precipitation falling during the rainy season (generally from November through March) (Western Regional Climate Center 2020). The SFBAAB lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds.

The mountains surrounding the SFBAAB, mostly at an elevation of between 1,000 and 1,200 feet above mean sea level (msl) within Alameda County, create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in early winter. The lack of surface wind during these periods combined with the reduced vertical flow caused by less surface heating results in a lower influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with smoke or when temperature inversions trap cool air, fog, and pollutants near the ground.

San Joaquin Valley Air Basin

The SVJAB is comprised of seven and one-half Counties including San Joaquin County, extending to the eastern portion of Kern County and that define the southern portion of California's Central Valley. Climate within the SJVAB is characterized by sparse rainfall, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100°F.

Climate is modified by topography. The bowl-shaped topography of the Central Valley, although extending for over 80 miles in minimum width measured between elevations of approximately 1,000 feet above msl and across the northern portion of the SJVAB, east-northeast of the project site, inhibits movement of pollutants out of the SJVAB and creates climatic conditions that are particularly conducive to air pollution formation. Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing and by transporting the pollution to other locations. Two significant diurnal wind cycles that occur frequently in the San Joaquin Valley are the sea breeze, and the mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the valley.

The vertical dispersion of air pollutants in the SJVAB can be limited by persistent temperature inversions. Air temperature in the lowest layer of the atmosphere typically decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. The height of the base of the inversion is known as the “mixing height.” This is the level to which pollutants can mix vertically. Mixing of air is minimized above and below the inversion base. The inversion base represents an abrupt density change where little air movement occurs.

Inversion layers are significant in determining pollutant concentrations. Concentration levels can be related to the amount of mixing space below the inversion. Temperature inversions that occur on the summer days are usually encountered 2,000 to 2,500 feet above the valley floor. In winter months, overnight inversions occur 500 to 1,500 feet above the valley floor (San Joaquin Valley Air Pollution Control District 2015a).

Pollutants of Concern

Criteria Air Pollutants

Criteria air pollutants are a group of six air pollutants for which the EPA and CARB have set ambient air quality standards (see Table 3.3-1). Ozone is considered a regional pollutant because its precursors affect air quality on a regional scale. CO, NO_2, SO_2, and lead are considered local pollutants that tend to accumulate in the air locally. Particulate matter is both a regional and local pollutant.

Concentrations of criteria pollutants are commonly used indicators of ambient air quality for which acceptable levels of exposure can be determined. The ambient air quality standards for these pollutants are set with an adequate margin of safety for public health and the environment (CAA Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants and form the scientific basis for new and revised ambient air quality standards.

Table 3.3-4 provides a brief description of sources and health effects of the six criteria pollutants. The primary criteria pollutants of concern generated by implementation of the project are ozone precursors (NO_X and ROG) and particulate matter.[1] Additional narrative on sources and health effects of these pollutants follows the table.

[1] Minor amounts of CO, NO_2, and SO_2 may be generated by construction sources. But these emissions are of less concern because nether construction nor operational activities associated with development projects are likely to generate substantial quantities of these criteria pollutants. Lead emissions are typically associated with industrial sources, which are not included as part of the project. Alameda County also currently attains the CAAQS and NAAQS for CO, NO_2, SO_2, and lead.

Table 3.3-4. Sources and Potential Health and Environmental Effects of Criteria Pollutants

Pollutant	Primary Sources	Potential Effects
Ozone	Formed by a chemical reaction between ROG and NO_X in the presence of sunlight. Primary sources of ROG and NO_X are vehicle exhaust, industrial combustion, gasoline storage and transport, solvents, paints, and landfills.	Inflammation of the mucous membranes and lung airways; wheezing; coughing and pain when inhaling deeply; decreased lung capacity; aggravation of lung and heart problems. Reduced crop yield and damage to plants, rubber, some textiles, and dyes.
Particulate matter	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, and automobiles.	Irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Carbon monoxide	A component of motor vehicle exhaust that is formed when carbon in fuel is not burned completely.	Reduced ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impaired vision and dizziness that can lead to unconsciousness or death.
Nitrogen dioxide	Motor vehicles, electric utilities, and other sources that burn fuel.	Aggravation of lung and heart problems. Precursor to ozone and acid rain. Contributes to global warming and nutrient overloading, which deteriorates water quality. Brown discoloration of the atmosphere.
Sulfur dioxide	Petroleum refineries, cement manufacturing, metal processing facilities, locomotives, large ships, and fuel combustion in diesel engines.	Aggravation of lung and heart problems. Converts to sulfuric acid, which can damage marble, iron, and steel. Damage to crops and natural vegetation. Impaired visibility.
Lead	Metal refineries, smelters, battery manufacturers, iron and steel producers, use of leaded fuels by racing and aircraft industries.	Anemia; damage to the kidneys, liver, brain, reproductive, nerves, and other organs; and neurological problems, including learning deficits and lowered IQ. Affects animals, plants, and aquatic ecosystems.

Source: California Air Pollution Control Officers Association n.d.

ROG = reactive organic gases; NO_X = nitrogen oxides; IQ = intelligence quotient.

Ozone

Ozone, or smog, is photochemical oxidant that is formed when ROGs and NO_X (both by-products of the internal combustion engine) react with sunlight. ROGs are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROGs are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. The two major forms of NO_X are nitric oxide (NO) and NO_2. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. In addition to serving as an integral participant in ozone formation, NO_X also directly acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens due to impairments to the immune system.

Ozone poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), children, older adults, and people who are active outdoors. Exposure to ozone at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggregate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Studies show associations between short-term ozone exposure and nonaccidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. Environmental Protection Agency 2019). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. Environmental Protection Agency 2016).

In addition to human health effect, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. Ozone can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products and other materials.

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair, is referred to as PM10. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair, is referred to as PM2.5. Major sources of PM10 include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM2.5 results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. Particulate matter also forms when gases emitted from industries and motor vehicles, such as SO_2, NO_X, and ROG, undergo chemical reactions in the atmosphere.

Particulate pollution can be transported over long distances and may adversely affect the human respiratory system, especially for people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Studies in the SFBAAB have shown that every 1 microgram per cubic meter reduction in PM2.5 results in a 1% reduction in mortality rate for individuals over 30 years old (Bay Area Air Quality Management District 2017a). Depending on its composition, both PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. Environmental Protection Agency 2020a).

Toxic Air Contaminants

Although NAAQS and CAAQS have been established for criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment.

Air toxics are generated by many sources, including: stationary sources, such as dry cleaners, gas stations, auto body shops, and combustion sources; mobile sources, such as diesel trucks, ships, and trains; and area sources, such as farms, landfills, and construction sites. Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) non-carcinogenic, and long-term (chronic) non-carcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders. The principal TACs associated with the project are DPM and asbestos.

DPM is generated by diesel-fueled equipment and vehicles. Within the SFBAAB, studies have found that of all controlled TACs, emissions of DPM are responsible for about 82 percent of the total ambient cancer risk (Bay Area Air Quality Management District 2017a). Short-term exposure to DPM can cause acute irritation (e.g., eye, throat, and bronchial), neurophysiological symptoms (e.g., lightheadedness and nausea), and respiratory symptoms (e.g., cough and phlegm). The International Agency for Research on Cancer (2012) has classified diesel engine exhaust as "carcinogenic to humans, based on sufficient evidence that exposure is associated with an increased risk for lung cancer."

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Before the adverse health effects of asbestos were identified, asbestos was widely used as insulation and fireproofing in buildings, and it can still be found in some older buildings. It is also found in its natural state in ultramafic rock (i.e., igneous and metamorphic rock with low silica content) that has undergone partial or complete alteration to serpentine rock (or serpentinite) and often contains chrysotile asbestos. The inhalation of asbestos fibers into the lungs can result in a variety of adverse health effects, including inflammation of the lungs, respiratory ailments (e.g., asbestosis, which is scarring of lung tissue that results in constricted breathing), and cancer (e.g., lung cancer and mesothelioma, which is cancer of the linings of the lungs and abdomen) (U.S. Environmental Protection Agency 2018). While naturally occurring asbestos (NOA) is found in Alameda County, the project site is not located in an area that is known to contain NOA (California Department of Conservation 2000)

Odors

Offensive odors can be unpleasant and lead to distress among the public. This distress can generate citizen complaints to local governments and air districts. According to CARB's (2005) *Air Quality and Land Use Handbook*, land uses associated with odor complaints typically include sewage treatment plants, landfills, recycling facilities, manufacturing, and agricultural activities. CARB provides recommended screening distances for siting new receptors near existing odor sources.

Existing Conditions

Ambient Air Quality Standards

The existing air quality conditions in the project site can be characterized by various monitoring data collected in the region. Because of incomplete monitoring data, Table 3.3-5 summarizes data for criteria air pollutant levels from the Livermore-Patterson Pass Road, Livermore-Rincon Avenue, and Tracy Airport air quality monitoring stations, which are located approximately 1 mile west, 10 miles west, and 7 miles east of the project site, respectively, for the 3 years from 2016 to 2018. Given its proximity to the project, where data are available from the Livermore-Patterson Pass Road, they are reported in the table. For pollutants or years not monitored by this station, the table is supplemented with data first from the Livermore-Patterson Pass Road station and then the Tracy Airport station. Air quality concentrations are expressed in terms of parts per million (ppm) or micrograms per cubic meter (μg/m³).

As shown in Table 3.3-5, the monitoring stations detected violations of the state and federal ozone, PM10, and PM2.5 standards. The state standards for CO and NO_2 were not exceeded. Existing violations of the ozone and PM ambient air quality standards indicate that certain individuals exposed to this pollutant may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

Table 3.3-5. Ambient Air Quality Monitoring Data from Livermore-Patterson Pass Road, Livermore-Rincon Avenue, and Tracy Airport Monitoring Stations (2016–2018)

Pollutant	2016	2017	2018
Ozone (O_3) *(Livermore-Patterson Pass Rd for 2016 and 2017; Livermore-Rincon Ave for 2018)*			
Maximum 1-hour concentration (ppm)	0.109	0.057	0.099
Maximum 8-hour concentration (ppm)	0.087	0.051	0.078
Number of days standard exceeded[a]			
CAAQS 1-hour (>0.09 ppm)	5	0	2
CAAQS 8-hour (>0.070 ppm)	15	0	3
NAAQS 8-hour (>0.070 ppm)	15	0	3
Nitrogen Dioxide (NO_2) *(Livermore-Patterson Pass Rd for 2016 and 2017; Livermore-Rincon Ave for 2018)*			
State maximum 1-hour concentration (ppm)	0.023	0.012	0.056
State second-highest 1-hour concentration (ppm)	0.015	0.011	0.055
Annual average concentration (ppm)	*	*	0.008
Number of days standard exceeded			
CAAQS 1-hour (0.18 ppm)	0	0	0
Particulate Matter (PM10)[c] *(Tracy Airport)*			
National[b] maximum 24-hour concentration (μg/m³)	53.0	152.0	250.2
National[b] second-highest 24-hour concentration (μg/m³)	45.7	85.4	179.4
State[c] maximum 24-hour concentration (μg/m³)	*	*	*
State[c] second-highest 24-hour concentration (μg/m³)	*	*	*
National annual average concentration (μg/m³)	18.6	22.6	24.7
State annual average concentration (μg/m³)[d]	*	*	*
Number of days standard exceeded[a]			
NAAQS 24-hour (>150 μg/m³)[e]	0	0	2
CAAQS 24-hour (>50 μg/m³)[e]	*	*	*
Particulate Matter (PM2.5) *(Livermore-Rincon Avenue)*			
National[b] maximum 24-hour concentration (μg/m³)	22.3	41.5	172.6
National[b] second-highest 24-hour concentration (μg/m³)	19.6	37.6	136.2
State[c] maximum 24-hour concentration (μg/m³)	22.3	41.5	172.6
State[c] second-highest 24-hour concentration (μg/m³)	19.6	37.6	136.2

Pollutant	2016	2017	2018
National annual average concentration (μg/m³)	7.4	8.4	11.2
State annual average concentration (μg/m³)[d]	7.5	8.4	11.3
Number of days standard exceeded[a]			
NAAQS 24-hour (>35 μg/m³)[e]	0	2	15

Sources: California Air Resources Board 2020a.

ppm = parts per million; NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; μg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; > = greater than;
* = insufficient data.

[a] An exceedance is not necessarily a violation.

[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California approved samplers.

[d] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[e] Mathematical estimate of how many days during which concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

Attainment Status

Local monitoring data (Table 3.3-5) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as shown below.

- Nonattainment—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified—assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Tables 3.3-6 and 3.3-7 summarize the attainment status of Alameda and San Joaquin Counties with respect to the NAAQS and CAAQS.

Table 3.3-6. Federal and State Attainment Status of the Project Site in Alameda County

Pollutant	NAAQS	CAAQS
Ozone	Marginal Nonattainment	Nonattainment
CO	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Moderate Nonattainment	Nonattainment
SO_2	Attainment	Attainment
NO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	No standard	Attainment
Visibility-Reducing Particles	No standard	Unclassified
Hydrogen Sulfide	No standard	Unclassified
Vinyl Chloride	No standard	Unclassified

Sources: U.S. Environmental Protection Agency 2020b; California Air Resources Board 2020b.

NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; CO = carbon monoxide; PM10 = particulate matter 10 microns or less in diameter; PM2.5 = particulate matter 2.5 microns or less in diameter; SO_2 = sulfur dioxide; NO_2 = nitrogen dioxide.

Table 3.3-7. Federal and State Attainment Status of the Project Site in San Joaquin Basin

Pollutant	NAAQS	CAAQS
Ozone	Extreme Nonattainment	Nonattainment
CO	Attainment	Attainment
PM10	Serious Maintenance	Nonattainment
PM2.5	Moderate/Serious Nonattainment	Nonattainment
SO_2	Attainment	Attainment
NO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	No standard	Attainment
Visibility-Reducing Particles	No standard	Unclassified
Hydrogen Sulfide	No standard	Unclassified
Vinyl Chloride	No standard	Unclassified

Sources: U.S. Environmental Protection Agency 2020b; California Air Resources Board 2020b.

NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; CO = carbon monoxide; PM10 = particulate matter 10 microns or less in diameter; PM2.5 = particulate matter 2.5 microns or less in diameter; SO_2 = sulfur dioxide; NO_2 = nitrogen dioxide.

Sensitive Receptors

Sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (i.e., 24-hour, 8-hour). Typical sensitive receptors are residences, hospitals, schools, and parks. The project site consists largely of cattle-grazed land supporting off-site operating wind turbines and ancillary facilities. There is one residence within the project site (Mulqueeney Ranch), located south of the PG&E Tesla substation, approximately 865 feet from the proposed staging/laydown area. Outside the project site, there are a few scattered residences along Midway Road and Patterson Pass Road, all of which are located more than 2,000 feet from the project site boundary.

3.3.2 Environmental Impacts

3.3.2.1 Methods for Analysis

Mass Emissions Analysis

Project construction emissions would primarily be in the BAAQMD. However, some equipment and materials would originate from the Port of Stockton and the city of Tracy, both of which are within the SJVAPCD. Accordingly, heavy-duty truck trip exhaust emissions that would be generated in the SJVAPCD have been quantified and included in the construction analysis. Operational emissions would be exclusively in the BAAQMD. Consistent with the PEIR, thresholds developed by the BAAQMD and SJVAPCD are used to evaluate the significance of the project's emissions and associated air quality impacts (San Joaquin Valley Air Pollution Control District 2015a; Bay Area Air Quality Management District 2017b).

Analysts estimated combustion exhaust and fugitive dust based on project-specific construction data (e.g., schedule, equipment, truck volumes) provided by the project engineer and a combination of emission factors and methodologies from CalEEMod, version 2016.3.2; CARB's EMFAC2017 model[2]; EPA's AP-42 Compilation of Air Pollutant Emission Factors, and several other industry-accepted tools, including local air quality CEQA Guidance (BAAQMD 2017; SJVAPCD 2015). All major design components of the project (e.g., road construction, turbine delivery) were quantitatively analyzed and included in the emissions modeling to ensure that emissions from construction and air quality impacts associated with the completed project were accurately assessed. Operational criteria pollutant emissions were estimated for routine maintenance activities, worker commutes, and vehicle trips. Refer to Appendix B for the detailed modeling assumptions.

Correlation of Emissions and Human Health Consequences

The California Supreme Court's decision in *Sierra Club v. County of Fresno* (6 Cal. 5th 502) (hereafter referred to as the Friant Ranch Decision) reviewed the long-term, regional air quality analysis contained in the EIR for the proposed *Community Plan Update* and *Friant Ranch Specific Plan* (Friant Ranch Project). The Friant Ranch Project is a 942-acre master-plan development in unincorporated Fresno County within the SJVAB. The Court found that the EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The Court's decision clarifies that environmental documents must attempt to connect a project's regional air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

For the Mulqueeney Ranch project, a quantitative correlation of project-generated regional criteria pollutant emissions to specific human health impacts would not yield accurate or meaningful results because it is a project with relatively small contributions of emissions (i.e., emissions that would be below the regional air district thresholds). As noted by the SJVAPCD:

> It is not feasible to conduct…analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task. [Similarly,] because of the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions [sulfur oxides and NOx] in an area does

[2] CARB's (2019) SAFE Vehicles Rule adjustment factors were applied to the emission factors for gasoline-powered vehicles

not necessarily result in an equivalent concentration of secondary PM in that area" (San Joaquin Valley Air Pollution Control District 2015b).

Moreover, BAAQMD and SJVAPCD have developed region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence regarding safe concentrations of criteria pollutants. Recognizing that air quality is a cumulative problem, BAAQMD and SJVAPCD typically consider projects that generate criteria pollutants and ozone precursor emissions that are below the thresholds to be minor in nature. Such projects would not adversely affect air quality or exceed the health-protective NAAQS or CAAQS.

3.3.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Conflict with or obstruction of implementation of the applicable air quality plan.
- A cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard.
- Exposure of sensitive receptors to substantial pollutant concentrations.
- Generation of objectionable odors adversely affecting a substantial number of people.

According to the State CEQA Guidelines Section 15064.7, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make significance determinations for potential impacts on environmental resources. As discussed earlier in this section, BAAQMD is primarily responsible for ensuring that state and federal ambient air quality standards are not violated in Alameda County, and SJVAPCD is responsible for project activities within its jurisdiction. The following sections summarize the local air district thresholds (where applicable) for each of the four impact criteria.

Plan Consistency

BAAQMD's *2017 Clean Air Plan* identifies strategies to bring regional emissions into compliance with federal and state air quality standards. BAAQMD's (2017b) *CEQA Guidelines* outline three criteria for determining if a plan-level project is consistent with the *2017 Clean Air Plan*. However, BAAQMD does not provide a threshold for project-level consistency analyses. Therefore, the following plan-level criteria will be used to determine if the project would conflict with or obstruct implementation of the *2017 Clean Air Plan.*

1. Does the project support the primary goals of the *2017 Clean Air Plan?*
2. Does the project include applicable control measures from the *2017 Clean Air Plan*?
3. Does the project disrupt or hinder implementation of any *2017 Clean Air Plan* control measures (e.g., hinder extension of transit line or bike path)?

SJVAPCD's clean air plans are not directly applicable to the proposed project because the project area is in the SFBAAB. The only emissions generating source in the SJVAPCD would be trucks transporting construction equipment, project components and aggregate from the Port of Stockton and the city of Tracy.

Cumulatively Considerable Net Increase in Criteria Pollutants

BAAQMD and SJVAPCD thresholds consider whether a project's emissions would result in a cumulatively considerable adverse contribution to existing air quality conditions, which do not currently attain the ozone or particulate matter standards. If a project's emissions would be less than these levels, the project would not be expected to result in a cumulatively considerable contribution to the significant cumulative impact. Accordingly, emissions generated by project construction would result in a significant impact if any of the thresholds summarized in Tables 3.3-2 and 3.3-3 are exceeded.

SJVAPCD's and BAAQMD's thresholds are based on the new source review (NSR) permit offset levels, which are designed to prevent new emission sources from affecting attainment progress. SJVAPCD has determined that use of SJVAPCD Rule 2201 (New Source Review - NSR) Offset thresholds as thresholds of significance for criteria pollutants is an appropriate and effective means of promoting consistency in significance determinations within the environmental review process and is applicable to both stationary and non-stationary emissions sources. SJVAPCD's attainment plans demonstrate that project specific emissions below their thresholds will have a less than significant impact on air quality (San Joaquin Valley Air Pollution Control District 2015a). BAAQMD has likewise concluded that the stationary pollutants described under the NSR program are equally significant to those pollutants generated with land use projects. BAAQMD's thresholds were set as the total emission thresholds associated within the NSR program to help attain the NAAQS (Bay Area Air Quality Management District 2017b).

Receptor Exposure to Substantial Pollutant Concentrations

All criteria pollutants that would be generated by the project are associated with some form of health risk (e.g., lower respiratory problems). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. As noted above, the primary pollutants of concern generated by the project are ozone precursors (ROG and NO_X), particulate matter, and TACs. The following sections discuss thresholds and analysis considerations for regional and local project-generated pollutants with respect to their human health implications.

Regional Pollutants

Adverse health effects induced by regional criteria pollutant emissions generated by the project (ozone precursors and particulate matter) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale. Emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollution may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an adverse health effect because there are large individual differences in the intensity of symptomatic responses to air pollutant. These differences are influenced, in part, by the underlying health condition of an individual, which cannot be known.

Nonetheless, emissions generated by the project could increase photochemical reactions and the formation of tropospheric ozone and secondary particulate matter, which at certain concentrations, could lead to increased incidence of specific health consequences, such as various respiratory and cardiovascular ailments. As discussed previously, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. Accordingly, the project would expose receptors to substantial regional pollution if any of the thresholds summarized in Tables 3.3-2 and 3.3-3 are exceeded.

Localized Pollutants

Localized pollutants generated by a project are deposited and potentially affect population near the emissions source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. The localized pollutants of concern associated with the project are particulate matter and TACs (DPM[3]). Following are the applicable thresholds for each pollutant. While not generated in substantial quantities by the project, BAAQMD and SJVAPCD have established screening procedures for CO emissions from onroad vehicles. These screening thresholds are also described below.

Particulate Matter

As shown in Tables 3.3-2 and 3.3-3, BAAQMD and SJVAPCD have adopted particulate matter thresholds of significance to evaluate whether construction- and operations-generated particulate matter would result in an air quality impact. SJVAPCD has also established a screening threshold of 100 pounds per day to help determine whether increased emissions from a project will cause or contribute to a localized violation of the ambient air quality standards. An AAQA was not prepared for the SJVAPCD because emissions do not exceed 100 pounds per day. Both air districts also recommends implementation of BMPs to reduce dust emissions and associated localized health impacts. Finally, BAAQMD has adopted an incremental concentration-based significance threshold to evaluate receptor exposure to localized PM2.5, where a "substantial" contribution is defined as PM2.5 concentrations exceeding 0.3 $\mu g/m^3$.

Diesel Particulate Matter

SJVAPCD and BAAQMD have adopted incremental cancer and hazard thresholds to evaluate receptor exposure to single sources of DPM. The "substantial" TAC threshold defined by BAAQMD is any exposure of a sensitive receptor to an individual emissions source resulting in an excess cancer risk level of more than 10 in 1 million or a non-cancer (i.e., chronic or acute) hazard index (HI) greater than 1.0. SJVAPCD's hazard index is also greater than 1 for the maximum exposed individual, but its cancer risk threshold is 20 in 1 million.

[3] As noted in Section 3.3.1, *Existing Conditions*, the project site is not located in an area that is known to contain Naturally Occurring Asbestos.

The BAAQMD's cumulative cancer risk threshold is 100 cases per million and its noncancer thresholds are a hazard index of greater than 10.0 and a PM2.5 concentration of greater than 0.8 $\mu g/m^3$. SJVAPCD does not have separate cumulative health risk thresholds.

Carbon Monoxide from Onroad Vehicles

BAAQMD (2017b) has adopted the following screening criteria that provide a conservative indication of whether project-generated traffic would cause a potential violation of the CO CAAQS:

- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- Project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).
- The project is consistent with an applicable CMP established by the county congestion management agency for designated roads or highways, RTP, and local congestion management agency plans.

SJVAPCD (2015a) has also adopted screening criteria for the analysis of CO concentration from project-generated traffic. These criteria are based on whether a project would reduce the LOS at affected intersections to LOS E or F. Given that BAAQMD's screening criteria include quantitative criteria based on the number of additional vehicles added to affected intersections, BAAQMD's screening criteria are conservatively used to evaluate whether onroad vehicles associated with the project would result in a CO hot spot and violation of the CO CAAQS.

Odors Emissions

There are no quantitative thresholds related to receptor exposure to objectionable odors. BAAQMD's (2017b) CEQA guide defines a significant odor impact as five confirmed odor complaints per year averaged over three years.

3.3.2.3 Impacts and Mitigation Measures

Impact AQ-1: Conflict with or obstruction of implementation of the applicable air quality plan (less than significant)

The PEIR concluded that Altamont Pass Wind Resource Area repowering projects would not conflict with the goals of BAAQMD's air quality attainment plans.

The primary goals of the *2017 Clean Air Plan* are to 1) attain the ambient air quality standards, reduce population exposure to unhealthy air, and 3) reduce GHG emissions and protect the climate. While minor amounts of emissions would be generated during construction, modeling demonstrates that short-term mitigated emissions resulting from proposed project construction would not exceed the BAAQMD significance thresholds (see Impact AQ-2). Ultimately, the project would result in long-term benefits from new renewable wind-generated energy, including reduction of criteria pollutants and GHG emissions relative to the production of comparable energy from fossil fuel sources. Accordingly, the project supports the primary goals of the *2017 Clean Air Plan*.

The *2017 Clean Air Plan* contains 85 control measures that are aimed at reducing air pollution in the SFBAAB. PEIR Mitigation Measures AQ-2a, *Reduce construction-related air pollutant emissions by* *implementing applicable BAAQMD Basic Construction Mitigation Measures*, and AQ-2b, *Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures* (required per Impact AQ-2), include measures to reduce fugitive dust and diesel exhaust emissions, consistent with the *2017 Clean Air Plan* control measures. Operationally, the project facilitates implementation of energy and climate measures by providing long-term generation of renewable wind energy. Accordingly, the project is consistent with applicable control measures from the *2017 Clean Air Plan*.

There are no public transit services, or pedestrian or bicycle facilities, present on the project access routes in the program area. However, the project would not preclude extension of a public transit line or bike lane, or otherwise create an impediment or disruption to implementation of any *2017 Clean Air Plan* control measures. Project effects on bicycle facilities are addressed in Section 3.16, Transportation and Traffic.

Accordingly, because the Mulqueeney project is consistent with the assumptions used in the PEIR and for the reasons described above, this impact would be less than significant, and no mitigation (beyond the measures required per Impact AQ-2) is required.

Impact AQ-2: Cumulatively considerable net increase of any criteria pollutant for which the Project region is a nonattainment area for an applicable federal or state ambient air quality standard (construction: less than significant with mitigation and operation: less than significant)

The PEIR concluded that maximum daily unmitigated ROG and NO_X from construction of repowering projects would exceed BAAQMD's significance thresholds, resulting in a significant impact. Fugitive dust would also constitute a significant impact without application of best management practices (BMPs).

Implementation of PEIR Mitigation Measures AQ-2a, *Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures*, and AQ-2b, *Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures*, would ensure that project impacts related to fugitive dust would be less than significant. However, implementation of these measures would not reduce project generated NO_X emissions to a less-than-significant level. Implementation of an additional mitigation measure, 2020 NEW Mitigation Measure AQ-2c*: Reduce construction-related air pollutant emissions to below BAAQMD NO_x thresholds*, which has been added to this SEIR as a required mitigation measure for the project, would reduce NO_X emissions to a less-than-significant level. Neither long-term operation of the project nor material hauling in SJVAPCD during construction would exceed any air district thresholds, and impacts would be less than significant.

Construction

Table 3.3-8 summarizes estimated unmitigated emissions in the SJVAB from construction of the proposed project. Emissions are presented in terms of tons per year and average pounds per day for comparison to SJVAPCD's (2015a) thresholds. Table 3.3-9 summarizes unmitigated emissions in the SFBAAB in terms of pounds per day. The total amount, duration, and intensity of construction activity could have a substantial effect on the amount of construction emissions, their concentrations, and the resulting impacts occurring at any one time. Consequently, the emission forecasts provided in this analysis reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction takes place in a relatively intensive and overlapped schedule. Because of this conservative assumption, actual emissions could be less than those forecasted.

Table 3.3-8. Unmitigated Criteria Pollutants from Project Construction in SJVAB

	Average Pounds per Day[a]						Tons per Year					
Activity	ROG	NO_X	CO	SO_2	PM10	PM2.5	ROG	NO_X	CO	SO_2	PM10	PM2.5
Offsite truck trips	2	27	5	<1	4	1	<1	1	<1	<1	<1	<1
SJVAPCD threshold[b]	100	100	100	100	100	100	10	10	100	27	15	15
Significant Impact?	No	No	No	No	No	No	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] Presents average emissions during a single day of construction in each year, consistent with guidance for correct application of SJVAPCD's ambient air quality analysis screening criteria.

[b] In developing these thresholds, SJVAPCD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable. The 100-pound-per-day threshold is a screening-level threshold to help determine whether increased emissions from a project will cause or contribute to a violation of the ambient air quality standards.

Table 3.3-9. Unmitigated Criteria Pollutants from Project Construction in SFBAAB

					PM10		PM2.5	
Activity	ROG	NO_X	CO	SO_2	Exhaust	Dust	Exhaust	Dust
Laydown, substations and switch yards	4	40	18	<1	1	25	1	7
Road construction	9	84	40	<1	3	53	3	14
Turbine foundations	13	133	63	<1	5	87	4	21
Turbine delivery and installation	3	28	19	<1	1	8	1	1
Utility collector line installation	1	17	11	<1	1	11	1	6
Restoration and cleanup	4	45	18	<1	1	24	1	1
Offsite truck trips	3	42	12	<1	1	7	1	2
Offsite worker trips	<1	<1	4	<1	<1	3	<1	1
Maximum Daily[a]	30	<u>317</u>	146	1	10	187	9	51
BAAQMD threshold[b]	54	54	–	–	82	BMPs	54	BMPs
Significant Impact?	No	*<u>Yes</u>*	No	No	No	*<u>Yes</u>*	No	*<u>Yes</u>*

ROG = reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] Includes all construction activities except turbine delivery and installation and restoration and cleanup, which would not occur during the period of maximum daily emissions.

[b] In developing these thresholds, BAAQMD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable.

As shown in Table 3.3-8, material hauling activity in the SJVAB would not exceed any of the thresholds of significance of the applicable air district (SJVAPCD).

As shown in Table 3.3-9, NO_x emissions generated by road construction and turbine foundation construction would independently exceed BAAQMD's threshold of significance. Maximum daily emissions from overlapping activities would also exceed the threshold. Consistent with BAAQMD guidance, the impact of fugitive dust emission would also be potentially significant without implementation of BMPs.

PEIR Mitigation Measures AQ-2a and AQ-2b are required to reduce NO_x and fugitive dust emissions from project construction. Implementation of an additional measure, 2020 NEW Mitigation Measure AQ-2c, which has been added to this SEIR as a required mitigation measure for the project, would reduce the remaining NOx exceedance to a less-than-significant level. Table 3.3-10 summarizes mitigated emissions in the SFBAAB.

Table 3.3-10. Mitigated Criteria Pollutants from Project Construction in SFBAAB

					PM10		PM2.5	
Activity	ROG	NO_X	CO	SO_2	Exhaust	Dust	Exhaust	Dust
Laydown, substations and switch yards	4	33	18	<1	1	11	1	3
Road construction	9	68	40	<1	2	22	2	6
Turbine foundations	13	108	63	<1	3	37	2	9
Turbine delivery and installation	3	23	19	<1	1	4	1	<1
Utility collector line installation	1	14	11	<1	<1	5	<1	2
Restoration and cleanup	4	36	18	<1	1	9	1	<1
Offsite truck trips	3	42	12	<1	1	7	1	2
Offsite worker trips	<1	<1	4	<1	<1	3	<1	1
Maximum Daily[a]	30	<u>266</u>	146	1	6	85	6	22
Maximum Daily with AQ-2c[b]	30	54	146	1	6	85	6	22
BAAQMD threshold[c]	54	54	–	–	82	BMPs	54	BMPs
Significant Impact?	No	No	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] Includes all construction activities except turbine delivery and installation and restoration and cleanup, which would not occur during the period of maximum daily emissions.

[b] 2020 NEW Mitigation Measure AQ-2c, which has been added to this SEIR as a required mitigation measure for the project, requires NOx emission be offset to BAAQMD's threshold of 54 pounds per day.

[c] In developing these thresholds, BAAQMD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable. BMPs are recommended for dust generated by all projects, regardless of whether other pollutants exceed thresholds.

Operation

Table 3.3-11 presents estimated emissions from operation of the project. These emissions would be exclusively in the SFBAAB and would begin following completion of project construction (i.e., the first operational year would be 2022). As shown in Table 3.3-11, operation emissions would not exceed BAAQMD's thresholds of significance. Accordingly, cumulative impacts during operation in the SFBAAB would be less than significant.

Table 3.3-11. Criteria Pollutants from Project Operation in BAAQMD (pounds per day)[a]

Activity	ROG	NO_X	CO	SO_2	PM10	PM2.5
Offsite worker trips	<1	<1	3	<1	3	1
Maintenance/operation	2	22	12	<1	6	1
Total	**2**	**22**	**15**	**<1**	**9**	**2**
BAAQMD threshold[b]	54	54	–	–	82	54
Significant Impact?	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter that is 10 microns in diameter and smaller; PM2.5 = particulate matter that is 2.5 microns in diameter and smaller; SO_2 = sulfur dioxide.

[a] Wind energy generated by the project would displace a comparable quantity of conventional grid energy. Power plants located throughout the state supply the grid with power; some of these generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant reductions achieved by the project cannot be fully ascribed to the BAAQMD and are therefore not reported in the table.

[b] In developing these thresholds, BAAQMD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable.

PEIR Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

The project proponents will require all contractors to comply with the following requirements for all areas with active construction activities.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered as needed to maintain dust control onsite—approximately two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite will be covered.
- All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads will be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage will be provided for construction workers at all access points.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified visible emissions evaluator.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The air district's phone number will also be visible to ensure compliance with applicable regulations.

PEIR Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

The project proponents will require all contractors to comply with the following requirements for all areas with active construction activities.

- During construction activities, all exposed surfaces will be watered at a frequency adequate to meet and maintain fugitive dust control requirements of all relevant air quality management entities.
- All excavation, grading, and/or demolition activities will be suspended when average wind speeds exceed 20 mph, as measured at the Livermore Municipal Airport.
- Wind breaks (e.g., trees, fences) will be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50% air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) will be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- If feasible and practicable, the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time will be limited.
- Construction vehicles and machinery, including their tires, will be cleaned prior to leaving the construction area to remove vegetation and soil. Cleaning stations will be established at the perimeter of the construction area.
- Site accesses to a distance of 100 feet from the paved road will be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures will be installed to prevent silt runoff to public roadways from sites with a slope greater than 1%.
- The idling time of diesel powered construction equipment will be minimized to 2 minutes.
- The project will develop a plan demonstrating that the offroad equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20% NO_X reduction and 45% PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
- Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
- All construction equipment, diesel trucks, and generators will be equipped with BACT for emission reductions of NO_X and PM.
- All contractors will use equipment that meets ARB's most recent certification standard for offroad heavy duty diesel engines.

2020 NEW Mitigation Measure AQ-2c: Reduce construction-related air pollutant emissions to below BAAQMD NO_x thresholds

The project proponents will ensure construction-related emissions do not exceed BAAQMD's construction NO_X threshold of 54 pounds per day. In addition to implementing PEIR Mitigation Measures AQ-2a and AQ-2b, the project proponents will coordinate with BAAQMD (or the Clean Air Foundation) to purchase NO_X credits to offset remaining NO_X construction and operations emissions exceeding BAAQMD thresholds.

The project proponents will track construction activity, estimate emissions, and enter into a construction mitigation contract with BAAQMD to offset NO_X emissions that exceed BAAQMD NO_X maximum daily threshold of 54 pounds per day.

The maximum daily emissions will be calculated on a daily basis by determining total construction-related NO_X emissions for each calendar day. BAAQMD will use the mitigation fees provided by the project proponents to implement emissions reduction efforts that offset project NO_X emissions that exceed the BAAQMD threshold.

This mitigation includes the following specific requirements:

- The project proponents will require construction contractors to provide daily construction activity monitoring data for all construction activities associated with the project to estimate actual construction emissions, including the effect of equipment emissions reduction measures. The project proponents will submit the daily construction activity monitoring data and an estimate of actual daily construction emissions to the lead agency and BAAQMD for review by the 15th day of each month for the prior construction month. The lead agency will examine the construction and operational activity monitoring to ensure it is representative, and BAAQMD will examine the emissions estimate to ensure it is calculated properly.
- After acceptance of the emissions estimates by BAAQMD for the prior month, the project proponents will submit mitigation fees to BAAQMD to fund offsets for the portion of daily emissions that exceed the maximum daily NO_X threshold. The mitigation fees will be based on the mitigation contract with BAAQMD (see discussion below) but will not exceed the emissions-reduction project cost-effectiveness limit set for the Carl Moyer Program for the year in which mitigation fees are paid. The current Carl Moyer Program cost-effectiveness limit is $30,000 per weighted ton of criteria pollutants (NO_X + ROG + [20*PM]). An administrative fee of 5% will be paid by the project proponents to BAAQMD to implement the program.
- The mitigation fees will be used by BAAQMD to fund projects that are eligible for funding under the Carl Moyer Program guidelines or other BAAQMD emissions-reduction incentive programs that meet the Carl Moyer Program cost-effectiveness threshold and are real, surplus, quantifiable, and enforceable.
- The project proponents will enter into a mitigation contract with BAAQMD for the emissions-reduction incentive program. The mitigation contract will include the following:
    - Identification of appropriate offsite mitigation fees required for the project.
    - Timing for submission of mitigation fees.
    - Processing of mitigation fees paid by the project proponents.
    - Verification of emissions estimates submitted by the project proponents.

- Verification that offsite fees are applied to appropriate mitigation programs within the SFBAAB.

The mitigation fees will be submitted within 4 weeks of BAAQMD acceptance of an emissions estimate provided by the project proponents showing that the maximum daily NO_X threshold was exceeded (when measured on a daily basis).

Impact AQ-3: Exposure of sensitive receptors to substantial pollutant concentrations (construction: less than significant with mitigation and operation: less than significant)

The PEIR concluded that receptor exposure to pollutant concentrations resulting from construction of the repowering projects would be a less-than-significant impact with implementation of PEIR Mitigation Measures AQ-2a and AQ-2b, which would reduce both criteria pollutants and DPM.

Regional Criteria Pollutants

As described under Impact AQ-2, construction of the project would not exceed BAAQMD or SJVAPCD emissions thresholds with implementation mitigation. Likewise, operational emissions would be well below BAAQMD thresholds. The project is also consistent with the *Alameda County General Plan* and does not conflict with BAAQMD's *2017 Clean Air Plan*, which contain public health goals and policies. For instance, the general plan includes policies to maximize the production of wind-generated energy, a clean energy source (Alameda County 2000). As such, emissions levels associated with implementation of the project would not contribute a significant level of pollution that could degrade regional air quality within the SFBAAB or SJVAB. Accordingly, this impact is less than significant with mitigation, and for this reason a quantitative correlation of project-generated regional criteria pollutant emissions to specific human health impacts was not performed.

Localized Particulate Matter

During earthmoving activities required for construction, localized fugitive dust would be generated. The amount of dust generated by a project is highly variable and dependent on the size of the disturbed area at any given time, the amount of activity, soil conditions, and meteorological conditions. Despite this variability in emissions, BAAQMD acknowledges that there are numerous control measures that can be reasonably implemented to significantly reduce construction fugitive dust emissions. Mitigation Measure PEIR Mitigation Measures AQ-2a and AQ-2b requires regular watering, covering of materials, and other practices that will reduce construction-related fugitive dust emissions by up to 75 percent, depending on the construction year and emissions source (Bay Area Air Quality Management District 2017b). With implementation of PEIR Mitigation Measures AQ-2a and AQ-2b, neither PM2.5 nor PM10 emissions would exceed BAAQMD's thresholds of significance (see Table 3.2-11). Accordingly, localized particulate matter emissions would be less than significant with mitigation and would not expose receptors to substantial pollutant concentrations or risks.

Localized Diesel Particulate Matter

Long-term operation of the proposed project would not result in a significant new source of DPM emissions. Offsite truck trips within the SJVAB during construction would be transitory and would use multiple roads over a widespread area, thereby helping to disperse toxic pollutants and minimize exposure. Onsite construction activities would generate DPM, but these activities would occur over a relatively short period—approximately 7 months, far less than the exposure duration of 30 years that is typically associated with chronic cancer risk (Office of Environmental Health

Hazard Assessment 2015). Emissions would also be spatially dispersed throughout the project area and at multiple turbine locations.

BAAQMD (2017b) has determined that construction activities occurring at distances of more than 1,000 feet from a sensitive receptor most likely do not pose a significant health risk. As discussed above, the nearest receptors outside the project area are more than 2,000 feet to the east. The Mulqueeney Ranch is the only receptor within the project area and is approximately 865 feet from the staging/laydown area. While exposure to DPM emissions would be of short duration, this receptor may be exposed to increased health risks during construction that could exceed BAAQMD thresholds. Accordingly, this impact is conservatively concluded to be potentially significant. Implementation of PEIR Mitigation Measures AQ-2a and AQ-2b would reduce DPM emissions and associated health risks. This impact would be less than significant with mitigation.

Localized Carbon Monoxide from Onroad Vehicles

Continuous engine exhaust may elevate localized CO concentrations, resulting in hot spots. Receptors exposed to these CO hot spots may have a greater likelihood of developing adverse health effects. CO hot spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. As discussed above, BAAQMD has developed screening criteria to assist lead agencies in evaluating potential impacts from localized CO. The construction workforce is not expected to exceed 69 daily trips for a single phase (assuming each person drove to the project site). Offsite hauling and light-duty truck trips would range from 52 to 305 trips per day per phase during those phases that require material movement. These volumes, which would spread throughout the project area and across numerous county roads, are well below BAAQMD's volume-based screening criteria (24,000 vehicles per hour at a single intersection) and would not negatively impact intersection operations. Therefore, the project would not contribute to a localized CO hot spot and would not expose receptors to substantial CO concentrations or risks.

PEIR Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

PEIR Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-4: Generation of objectionable odors adversely affecting a substantial number of people (less than significant)

The PEIR concluded that neither construction nor operation of the repowering projects would result in significant odor impacts. Odor emissions of the proposed project would be to the same as those evaluated at the program level (PEIR Impact AQ-5); they would be primarily limited to the construction period. Sources of odors during construction would be diesel-powered trucks and vehicles. Potential odors from these sources would be temporary (7 months) and spatially dispersed over the project area. Accordingly, the proposed project is not anticipated to create objectionable odors that would violate air district nuisance rules. This impact would be less than significant, and no mitigation is required.

3.3.3 References Cited

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3.4 Biological Resources

This section describes the regulatory and environmental setting for biological resources within the Mulqueeney Ranch Wind Repowering Project (project) site and region. It also describes impacts on these resources that could result from implementation of the project, and mitigation measures that would serve to reduce or avoid significant impacts on such resources.

3.4.1 Existing Conditions

3.4.1.1 Regulatory Setting

This sub-section provides an overview of the major laws and regulations that pertain to biological resources in the project site.

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over species listed as threatened or endangered under Section 9 of the federal Endangered Species Act (ESA). ESA protects listed species from take, which is broadly defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." For any project involving a federal agency (e.g., U.S. Army Corps of Engineers [USACE]) in which a listed species could be affected, the federal agency must consult with USFWS in accordance with Section 7 of the ESA. USFWS issues a biological opinion and, if the project does not jeopardize the continued existence of the listed species, issues an incidental take permit. When no federal context is present, proponents of a project affecting a listed species may consult with the USFWS and apply for an incidental take permit under Section 10 of the ESA. Section 10 requires an applicant to submit a conservation plan that specifies project impacts and mitigation measures.

Bald and Golden Eagle Protection Act

The Eagle Act (16 United States Code [USC] 668), signed into law in 1940 and expanded in 1962 to include golden eagle, prohibits take and disturbance of individuals and nests. Take under the Eagle Act includes any actions to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, and disturb eagles. Disturb is further defined in 50 Code of Federal Regulations (CFR) Part 22.3 as:

> to agitate or bother a bald (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos)* to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

Prior to 2009, permits for purposeful take of birds or body parts were limited to scientific (50 CFR 22.21), religious (50 CFR 22.22), or falconry (50 CFR 22.24) pursuits; eagles causing serious injury to livestock or other wildlife (50 CFR 22.23); and golden eagle nests that interfere with resource development or recovery operations (50 CFR 22.21–25). In 2009, USFWS issued the 2009 Final Rule on new permit regulations that allows take "for the protection of…other interests in any particular locality" and where the take is "associated with and not the purpose of an otherwise lawful activity…" (74 *Federal Register* [FR] 46836–46879). The 2009 Final Rule authorized programmatic take (take that is recurring and not in a specific, identifiable timeframe or location) of eagles only if avoidance measures have been implemented to the maximum extent achievable such that take was no longer avoidable.

In 2016, USFWS issued revisions to the Final Rule pertaining to incidental take and take of eagle nests. The Final Rule changed the programmatic take standard to a new standard authorizing "incidental take" if all "practicable" measures to reduce impacts on eagles are implemented. An eagle incidental take permit under the 2016 Revisions to the Final Rule (50 CFR 22) is available for activities that may disturb or otherwise take eagles on an ongoing basis, such as operational activities. The eagle incidental take permit under the 2009 Final Rule was valid up to 5 years. In 2012, USFWS proposed to extend the maximum term for eagle incidental take permits from 5 to 30 years (77 FR 22267–22278). In 2013, USFWS issued a Final Rule to extend the maximum term for eagle incidental take permits to 30 years, subject to a recurring 5-year review process throughout the life of the permit. Although this rule was challenged in 2015, the final regulations under the 2016 Revisions to the Final Rule also include a maximum permit term of 30 years, subject to a recurring 5-year review process throughout the life of the permit (81 FR 91494–91554).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC 703–712) enacts the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 21; 50 CFR 10). Most actions that result in take—defined as hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof—are prohibited under the MBTA. Examples of permitted actions that do not violate the MBTA are the possession of a hunting license to pursue specific gamebirds, legitimate research activities, display in zoological gardens, bird-banding, and other similar activities. USFWS is responsible for overseeing compliance with the MBTA.

On December 22, 2017, the U.S. Department of the Interior Office of the Solicitor issued a memorandum: M-37050 The Migratory Bird Treaty Act Does Not Prohibit Incidental Take (referred to as the Jorjani Opinion). The Jorjani Opinion withdrew and replaced Solicitor's Opinion M-37041—Incidental Take Prohibited Under the Migratory Bird Treaty Act (referred to as the Tompkins Opinion), issued January 10, 2017. The Jorjani Opinion concludes that "the MBTA's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same only criminalize affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs." USFWS issued guidance on the Jorjani Opinion on April 11, 2018, to clarify what constitutes prohibited take and what actions must be taken when conducting lawful intentional take. The guidance interprets the Jorjani Opinion to mean that the MBTA's prohibitions on take apply when the purpose of an action is to take migratory birds, their eggs, or their nests. The take of birds, eggs, or nests that results from an activity, the purpose of which is not to take birds, eggs, or nests, is not prohibited by the MBTA. In May and September 2018, three lawsuits were filed challenging the Jorjani Opinion's interpretation of the MBTA. On August 11, 2020, the United States District Court Southern District of New York concluded that the Jorjani Opinion is contrary to the plain meaning of the MBTA and therefore must be vacated. The court vacated the Jorjani Opinion and remanded the case to U.S. Department of the Interior and USFWS for further action.

California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of endangered and threatened species; however, habitat destruction is not included in the state's definition of *take*. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. The California Department of Fish and Wildlife (CDFW) administers CESA and authorizes take through Section 2081 agreements.

California Fish and Game Code

Fully Protected Species

The California Fish and Game Code provides protection from take for a variety of species, referred to as *fully protected species*. Section 5050 lists fully protected amphibians and reptiles, Section 3515 lists fully protected fish, Section 3511 lists fully protected birds, and Section 4700 lists fully protected mammals. The California Fish and Game Code defines *take* as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research or authorized pursuant to an approved natural community conservation plan (NCCP), all take of fully protected species is prohibited.

Sections 3503 and 3503.5

Section 3503 of the California Fish and Game Code prohibits the ~~killing of birds and the~~ destruction of bird eggs or nests. Section 3503.5 prohibits the killing of ~~raptor~~birds-of-prey species and the destruction of raptor nests.

Section 3800(a)

Section 3800(a) of the California Fish and Game Code makes it unlawful to take any nongame bird except as provided in the Code or in accordance with regulations of the California Fish and Game Commission. All birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, are nongame birds.

Section 1600: Streambed Alteration Agreements

In addition to regulating listed and special-status species, CDFW regulates activities that would interfere with the natural flow—or substantially alter the channel, bed, or bank—of a lake, river, or stream. These activities are regulated under California Fish and Game Code Sections 1600–1616 and require a streambed alteration agreement if they would substantially adversely affect an existing fish or wildlife resource. Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. CDFW may require avoidance or minimization of vegetation removal, use of standard erosion control measures, limitations on the use of heavy equipment, limitations on work periods to avoid impacts on fish and wildlife, and restoration of degraded sites or compensation for permanent habitat losses, among other conditions. Aquatic resources (i.e., wetlands and streams) are present in the project site and a streambed alteration agreement may be required if the project would affect wildlife habitat associated with these resources.

Clean Water Act

The Clean Water Act (CWA) was passed by Congress in 1972 with a broad mandate "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The chief purpose of the CWA is to establish the basic structure for regulating discharges of pollutants into waters of the United States. The CWA authorizes the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations, and includes programs addressing both point-source and nonpoint-source pollution. Point-source pollution is pollution that originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. Nonpoint-source pollution originates over a broader area and includes urban contaminants in stormwater runoff and sediment loading from upstream areas. The CWA operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool.

On April 21, 2020, the Navigable Waters Protection Rule was published in the FR, providing a new and more restrictive definition of wetlands and nonwetland waters that are regulated under the CWA. This new rule took effect on June 22, 2020. Aquatic resources (i.e., wetlands, ponds, and streams) are present in the project site and may be regulated under CWA Section 404. Aquatic resources that are no longer regulated as a result of implementing the Navigable Waters Protection Rule will be regulated by the State Water Resources Control Board (State Water Board) based on the recently adopted state wetland definitions and procedures (see Porter-Cologne Water Quality Control Act).

Section 402: Permits for Stormwater Discharge

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by EPA. In California, the State Water Board is authorized by EPA to oversee the NPDES program through the Regional Water Quality Control Boards (Regional Water Boards).

NPDES permits are required for projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP must include a site map, a description of proposed construction activities, and the best management practices (BMPs) that will be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants. Because the project would disturb more than 1 acre of land, the applicant would prepare a SWPPP and apply for an NPDES permit.

Section 404: Permits for Placement of Fill in Waters of the United States (Including Wetlands)

Waters of the United States (including wetlands) are protected under Section 404 of the CWA. Any activity that involves a discharge of dredged or fill material into waters of the United States, including wetlands, is subject to regulation by USACE. *Waters of the United States* is defined to encompass navigable waters of the United States; interstate waters; all other waters where their use, degradation, or destruction could affect interstate or foreign commerce; tributaries of any of these waters; and wetlands that meet any of these criteria or are adjacent to any of these waters or their tributaries. *Wetlands* are defined under Section 404 as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three wetland delineation criteria.

- They support hydrophytic vegetation (i.e., plants that grow in saturated soil).
- They have hydric soil types (i.e., soils that are wet or moist enough to develop anaerobic conditions).
- They have wetland hydrology.

Section 401: Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must apply for water quality certification from the state. Therefore, all projects with a federal component that may affect the quality of waters of the state (including projects that require federal approval, such as a CWA Section 404 permit) must comply with CWA Section 401.

In California, CWA Section 401 is administered by the State Water Board through the Regional Water Boards. All areas qualifying as waters of the United States under CWA Section 404 also qualify as waters of the State of California (waters of the state) under the jurisdiction of CWA Section 401 and the State Water Board and Regional Water Boards; however, some areas considered as waters of the state do not qualify as waters of the United States. State Water Board jurisdiction at streams, lakes, and ponds considered as waters of the United States extends beyond the ordinary high water mark (OHWM) to the top of bank or to the greatest lateral extent of riparian vegetation, whichever is greater. Isolated wetlands, nonnavigable waters, and intrastate waters may also qualify as waters of the state subject to State Water Board jurisdiction under CWA Section 401.

As currently designed, the proposed project is expected to result in a discharge of pollutants into waters of the United States; accordingly, a CWA Section 401 water quality certification from the Regional Water Board will be required. All riparian areas associated with streams in the project site also qualify as jurisdictional wetlands and are mapped and described in the delineation of aquatic resources. All features in the project site are both waters of the state and waters of the United States.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) definition, waters of the state are “any surface water or groundwater, including saline waters, within the boundaries of the state.” Although all waters of the United States that are within the borders of California are also waters of the state, the reverse is not true. Therefore, California retains authority to regulate discharges of waste into any waters of the state, regardless of whether USACE has concurrent jurisdiction under CWA Section 404, and defines discharges to receiving waters more broadly than the CWA does. In 2019, The State Water Board adopted the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures), which revised and clarified the regulation of state wetlands and procedures for permitting impacts on wetlands. The Procedures took effect on May 28, 2020 (California State Water Resources Control Board 2019, 2020).

Waters of the state fall under the jurisdiction of the nine Regional Water Boards. Under the Porter-Cologne Act, each Regional Water Board must prepare and periodically update water quality control basin plans. The basin plan that is in place for the Central Valley Regional Water Board is the Sacramento River Basin and San Joaquin River Basin Water Quality Control Plan. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution. California Water Code Section 13260 requires any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements) with the applicable Regional Water Board. California Water Code Section 13050 authorizes the State Water Board and the affiliated Regional Water Board to regulate biological pollutants. Aquatic invasive plants discharged to receiving waters are an example of this kind of pollutant. Construction and restoration activities associated with the proposed project that may discharge wastes into the waters of the state must meet the discharge control requirements of the Porter-Cologne Act.

Executive Order 11312: Invasive Species

Executive Order 11312 (February 3, 1999) directs all federal agencies to prevent and control the introduction and spread of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their effects on economic, ecological, and human health. The executive order was intended to build upon existing laws, such as the National Environmental Policy Act, the Nonindigenous Aquatic Nuisance Prevention and Control Act, the Lacey Act, the Plant Pest Act, the Federal Noxious Weed Act, and ESA. The executive order established a national Invasive Species Council composed of federal agencies and departments, as well as a supporting Invasive Species Advisory Committee composed of state, local, and private entities. The council and advisory committee oversee and facilitate implementation of the executive order, including preparation of the National Invasive Species Management Plan. The project may introduce invasive species and, thus, federal agencies would be required to consider this executive order prior to issuing permits.

Land-Based Wind Energy Guidelines

The voluntary *Land-Based Wind Energy Guidelines* (Wind Energy Guidelines) were developed by USFWS (2012) in collaboration with the Wind Turbine Guidelines Advisory Committee to replace interim voluntary guidance prepared in 2003. The Wind Energy Guidelines discuss various risks to species of concern from wind energy projects and provide guidance for assessing potential adverse effects on species of concern and their habitats using a tiered approach. Species of concern include migratory birds; bats; bald and golden eagles and other birds of prey; prairie and sage grouse; and listed, proposed, or candidate species. During the preconstruction tiers (Tiers 1, 2, and 3), developers work to identify, avoid, and minimize risks to species of concern. During postconstruction tiers (Tiers 4 and 5), developers assess whether actions taken in earlier tiers to avoid and minimize impacts are successfully achieving the goals and, when necessary, take additional steps to compensate for impacts. Each tier builds upon the previous tier(s) by refining and building upon issues previously raised and efforts undertaken. The stages of the Wind Energy Guidelines follow these tiers closely.

- Tier 1—Preliminary site evaluation (landscape-scale screening of possible project sites).
- Tier 2—Site characterization (broad characterization of one or more potential project sites).
- Tier 3—Field studies to document site-specific wildlife and habitat and predict project impacts.
- Tier 4—Postconstruction studies to estimate impacts.
- Tier 5—Other postconstruction studies and research.

The tiered approach allows developers to evaluate and make decisions at each stage. Developers can either abandon or proceed with project development, or they can collect additional information if required. If sufficient data are available for a specific tier, the following outcomes are possible.

- The project proceeds to the next tier in the development process without additional data collection.
- The project proceeds to the next tier in the development process with additional data collection.
- An action or combination of actions, such as project modification, mitigation, or specific postconstruction monitoring, is indicated.
- The project site is abandoned because the risk is considered unacceptable.

If sufficient data are not available for any tier, more intensive study is conducted in the subsequent tier until sufficient data are available to make a decision to modify the project, proceed with the project, or abandon the project. Following the Wind Energy Guidelines is voluntary, but USFWS will consider a developer's adherence to the Wind Energy Guidelines if a violation occurs.

3.4.1.2 Environmental Setting

The approximately 4,600-acre project site is located within the Altamont Pass Wind Resource Area (APWRA), an approximately 50,000-acre area that extends across the northeastern hills of Alameda County and a smaller portion of Contra Costa County to the north. The project region is generally characterized by mostly treeless rolling foothills of annual grassland. The dominant land uses are wind energy generation, agriculture, and cattle grazing. Major anthropogenic features of the region are the wind turbines and ancillary facilities, high-voltage power transmission lines, a substation, Interstate 580, railroad lines, and ranch houses.

The project site is generally characterized by rolling foothills of annual grassland that are steeper on the west and south and gradually flatter toward the east where the terrain slopes toward the floor of the Central Valley. Elevations range from approximately 380 to 1,880 feet above sea level. Land uses in the project site and surrounding area consist largely of cattle grazing and operating wind turbines and ancillary facilities. Many of the parcels on the project site were previously used for wind production. Historic land ownership and uses altered the topography and hydrology in the project site, including access roads used for ranching and maintenance of the wind turbines, an electrical substation occupying approximately 1.5 acres in the northwest corner of the project site, transmission lines of various sizes, and five existing temporary meteorological towers. Prior to 2016, the project site was occupied by 518 old generation wind turbines, which were installed primarily in the 1980s. As of 2005, however, the prior CUPs for the site approved the continued operation of 711 of these turbines with a total capacity of 74 megawatt (MW). Based on the conditions of approval, turbines with higher risk to focal raptor species were required to be removed, which is why there were only 518 turbine sites as of 2016. The 518 wind turbines and foundations (generally pier-type foundations) were decommissioned and removed in 2016.

The project site is within Conservation Zone 10 of the East Alameda County Conservation Strategy (EACCS), a document used by the County to guide development planning and the permitting process to ensure that impacts are offset in a biologically effective manner. Several established conservation easements and habitat preserves are located adjacent to the project site (Figure 3.4-1) and are described and discussed below.

Land Cover Types

A *land cover type* is defined as the dominant character of the land surface discernible from aerial photographs, as determined by vegetation, water, or human uses. Land cover types are the most widely used units in analyzing ecosystem function, habitat diversity, natural communities, wetlands and streams, and covered species habitat.

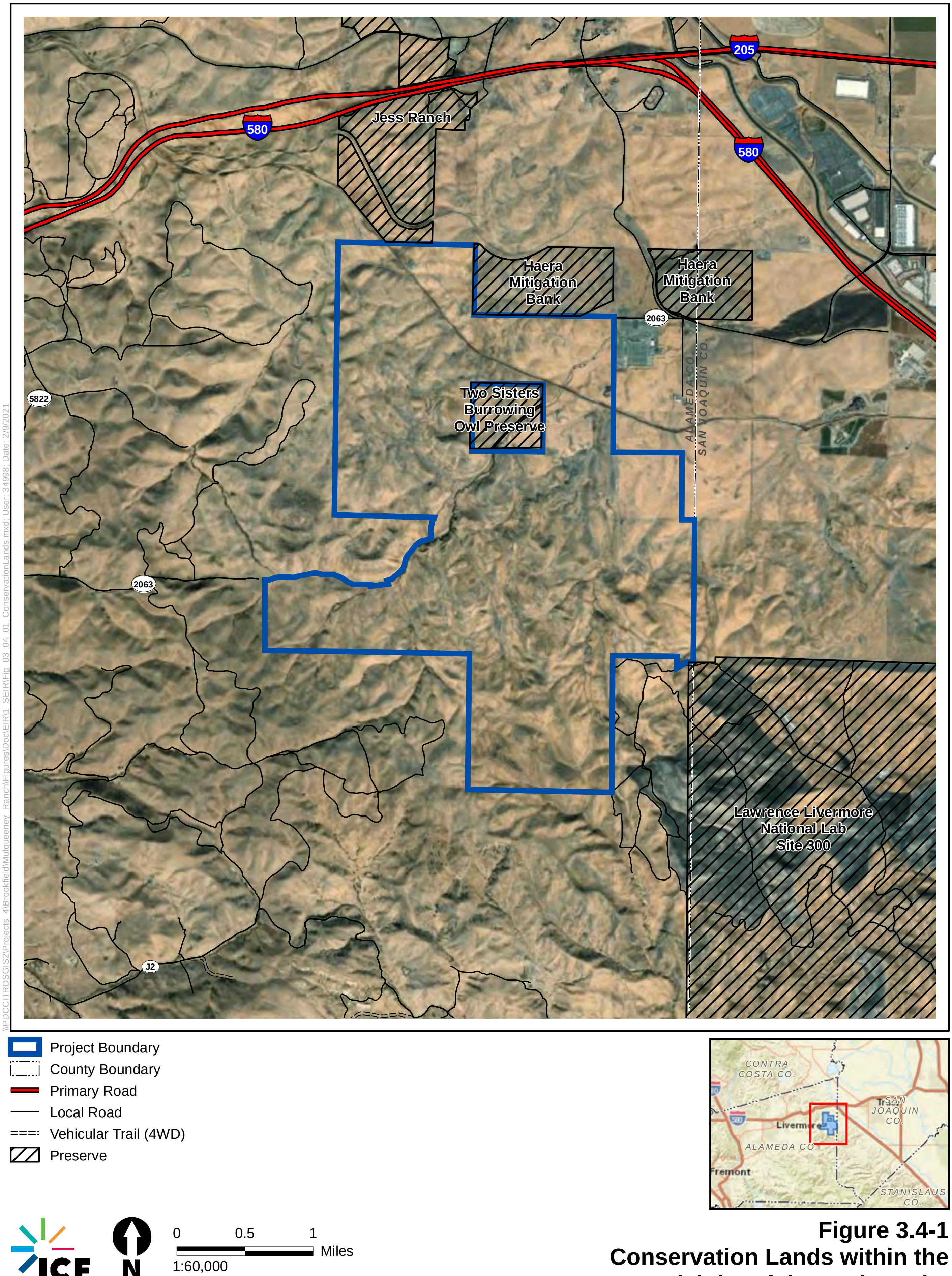


Figure 3.4-1
Conservation Lands within the Vicinity of the Project Site

The 12 land cover types within the project site are summarized in Table 3.4-1 and described below the table. Land cover mapping was conducted through a desktop review of aerial photography in Google Earth Pro and during the aquatic resources delineation. A survey to ground truth the scrub land cover type was conducted in October 2019 in coordination with the California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*) habitat assessment. Geographic information system (GIS) software was used to calculate land cover acreages using the land cover map that was created from the desktop review and delineation. (Figures 3.4-2a and 3.4-2b).

Wetlands (alkali wetland, riparian wetland, freshwater marsh, scrub-shrub wetland, and vernal pool) and nonwetland waters (ephemeral stream, intermittent stream, pond) mapped within the project site are considered potential waters of the United States and waters of the state that would be subject to federal regulation under CWA Sections 401 and 404 and/or to state regulation under the Porter-Cologne Act. In addition, the wetland and nonwetland waters exhibiting a bed and bank would be regulated under California Fish and Game Code Section 1602.

Table 3.4-1. Approximate Acreage of Land Cover Types

Land Cover Type	Acres*
Nonnative annual grassland	4,371.03
Riparian (forested wetland)	7.34
Alkali wetland	15.52
Freshwater marsh	1.15
Scrub-shrub wetland	1.68
Vernal pool	1.62
Pond	3.71
Intermittent stream	2.43
Ephemeral stream	2.30
Scrub	3.81
Rock outcrop	47.72
Developed	147.10
Total	**4,605.41**

*Acreage of wetlands and nonwetland waters were verified by the USACE in a preliminary jurisdictional determination on August 14, 2020.

Nonnative Annual Grassland

Nonnative annual grassland, the most common biological community in the delineation area, is an herbaceous community dominated by naturalized annual grasses intermixed with perennial and annual forbs. Annual grassland in the project site commonly exhibits low levels of diversity and is dominated by ripgut brome (*Bromus diandrus*), soft chess brome (*Bromus hordeaceous*), Italian ryegrass (*Festuca perennis*), wild oat (*Avena fatua*), and yellow star-thistle (*Centaurea solstitialis*).

Riparian (forested wetland)

Riparian vegetation is primarily located below the OHWM of Patterson Creek. Riparian areas were dominated by Fremont's cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), and California bay (*Umbellularia californica*).

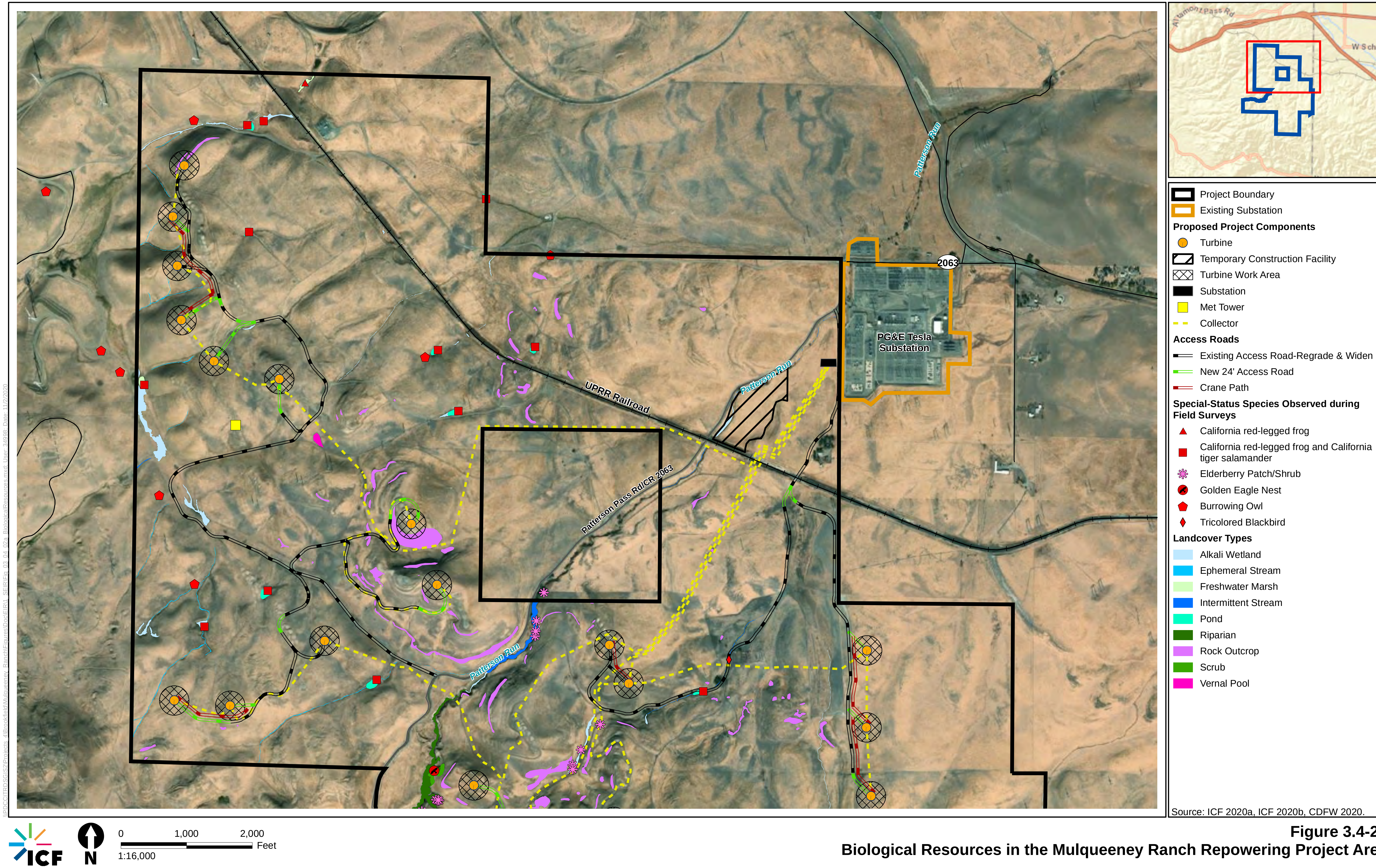


Figure 3.4-2a
Biological Resources in the Mulqueeney Ranch Repowering Project Area

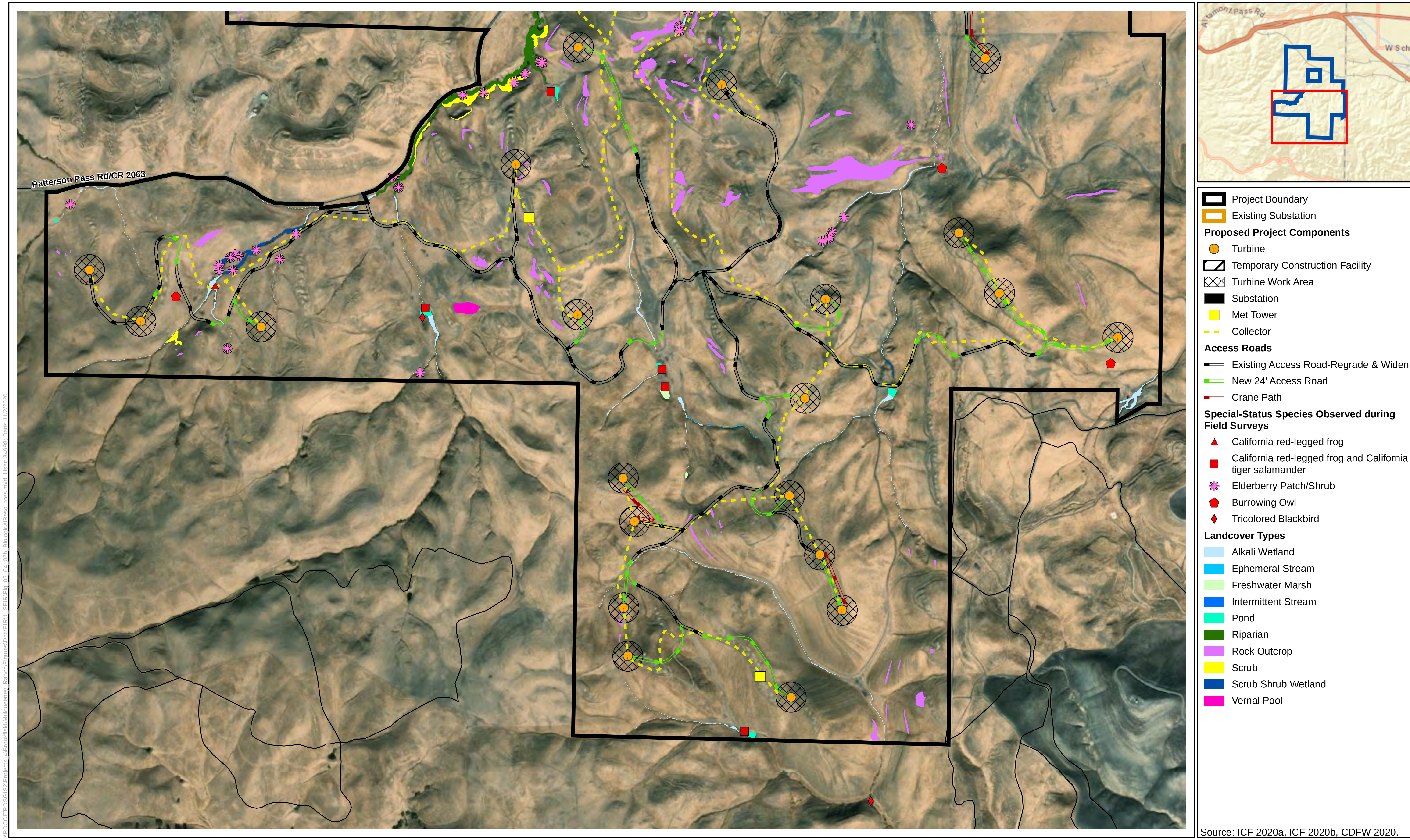


Figure 3.4-2b
Biological Resources in the Mulqueeney Ranch Repowering Project Area

Alkali Wetland

Alkali wetlands are relatively common in the project site, occurring in low-lying areas and valleys as both basin-shaped features and linear drainages. Portions of alkali wetland are intermittently flooded and saturated by alkaline water and are dominated by Italian ryegrass, rabbitsfoot grass (*Polypogon monspeliensis*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), saltgrass (*Distichlis spicata*), Baltic rush (*Juncus balticus*) and soft chess brome. Grasses are typically of short stature, growing less than about 3 feet high.

Freshwater Marsh

Freshwater marshes are located in a range of elevations, but the vegetation types are restricted to topographic lows with standing or flowing water. The freshwater marshes were dominated by broadleaved cattail (*Typha latifolia*), hard-stem bulrush (*Schoenoplectus acutus* var. *acutus*) and common three square (*Schoenoplectus pungens*).

Scrub-Shrub Wetland

Scrub-shrub wetlands are present below the OHWM of Patterson Creek. The scrub-shrub wetlands are dominated by red willow.

Vernal Pool

Two vernal pools were delineated in the project site; one was pristine and the other degraded, as indicated by the dominance of nonnative vegetation. Remnant vegetation observed during the late summer was dominated by vernal pool allocarya (*Plagiobothrys stipitatus*), willowherb (*Epilobium densiflorum*), and Mediterranean barley.

Pond

Ponds in the project site are small permanent or seasonal bodies of water that have been constructed for the purposes of retaining runoff water for livestock use. The surface area of these features fluctuates widely throughout the year. In the project site, these features are located in low-lying streams and valley bottoms, and the vegetation surrounding them is typically dominated by saltgrass and nonnative annual grassland species. Some of the ponds were lined by bulrush and cattail.

Intermittent Stream

Intermittent streams are located in low-lying areas and valley bottoms in the project site. All intermittent streams are unvegetated, or sparsely vegetated with wetland vegetation. The only named intermittent stream in the project site is Patterson Creek.

Ephemeral Stream

Ephemeral streams occur in low-lying areas and valley bottoms in the project site. Some ephemeral streams are unvegetated, while others are dominated by nonnative annual grassland species as described above for nonnative annual grassland.

Scrub

Scrub areas are scattered along the Patterson Creek canyon. Three types of scrub are present and described below.

California Sagebrush Scrub

California sagebrush scrub is the dominant scrub type in the project site. It is located in several patches along Patterson Creek. The dominant species is California sagebrush (*Artemisia californica*). Other species present are California fuchsia (*Epilobium canum*), buckwheat (*Eriogonum* sp.), and hairy gumweed (*Grindelia hirsutula*).

Prunus Scrub

Prunus scrub is located in one area on a northeast-facing slope along a tributary of Patterson Creek. The dominant species is likely cherry plum (*Prunus cerasifera*); however, it was not in flower during the October field survey to assess habitat suitability for California tiger salamander and California red-legged frog. The species will be identified during the spring botanical surveys. Other shrub species present are California mugwort (*Artemisia douglasiana*), California fuchsia, coyote brush (*Baccharis pilularis*), and white horehound (*Marrubium vulgare*). Further upslope, the dominant species transition to silver bush lupine (*Lupinus albifrons*) and gooseberry/currant (*Ribes* sp.).

California Rose Shrubland

California rose shrubland is located in one area on a northeast-facing slope along Patterson Creek. It is dominated by California rose (*Rosa californica*) and blue elderberry (*Sambucus nigra*). Other species present are hairy gumweed and California sagebrush.

Rock Outcrop

Rock outcrops are scattered along ridges and hills in the project site. With lower density of nonnative annual grasses, the rock outcrops could provide refuge for native plant species. Buckwheat species observed in association with rock outcrops were annual angled stem buckwheat (*Eriogonum angulosum*) and Wright's buckwheat (*Eriogonum wrightii*).

Developed

Developed areas within the project site include Patterson Pass Road, gravel roads, an electric facility, and an abandoned cattle ranch with several structures.

Land Uses and Preserves

Several habitat preserves and natural lands managed for sensitive biological resources are located in the vicinity of the project site. The size of these habitat areas and the species they are managed for are listed below. The boundaries of the preserves and managed lands are depicted on Figure 3.4-1.

- Haera Wildlife Conservation Bank (299 acres)—Wildlands Mitigation Bank, which provides habitat for burrowing owl, San Joaquin kit fox, California tiger salamander, and American badger.
- Jess Ranch Mitigation Site (123 acres)—established by Contra Costa Water District to provide mitigation for California tiger salamander, California red-legged frog, burrowing owl, and San Joaquin kit fox.
- Two Sisters Burrowing Owl Preserve (156 acres)—established by Wildlands to mitigate for burrowing owl.

- Lawrence Livermore National Laboratory Site 300—a 7,000-acre site used for non-nuclear experimental tests that is managed to support several state and federally protected species including large-flowered fiddleneck (*Amsinckia grandiflora*), Alameda whipsnake, California tiger salamander, and golden eagle.

Special-Status Species

For the purpose of this report, *special-status species* are plants and animals that are legally protected under ESA, CESA, or other regulations, or species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are those species in any of the categories listed below.

- Species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the FR [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (84 FR 54732, October 10, 2019).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations [CCR] 670.5).
- Species that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA) (State CEQA Guidelines 15380).
- Animals fully protected in California (California Fish and Game Code 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Animal species of special concern to the CDFW (California Department of Fish and Wildlife 2019a).
- Bats identified as medium or high priority on the Western Bat Working Group (WBWG) regional priority species matrix (Western Bat Working Group 2017).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.).
- Plants considered by CDFW and the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Ranks [CRPR] 1B and 2) (California Department of Fish and Wildlife 2020b; California Native Plant Society 2020).
- Plants identified by CDFW and CNPS about which more information is needed to determine their status, and plants of limited distribution (CRPR 3 and 4), (California Department of Fish and Wildlife 2020b; California Native Plant Society 2020), which may be included as special-status species on the basis of local significance or recent biological information.

Special-Status Plants

Based on a review of the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2020b) and CNPS Inventory (California Native Plant Society 2020), Twenty (20) special-status plant species were identified as having recorded occurrences and/or the potential to occur in the project vicinity (within approximately 5 miles of the project site) (Table 3.4-2 at the end of Section 3.4.1, *Existing Conditions*). Grassland and wetland habitats present in the project site have moderate to high potential to support 17 of these 20 species. The remaining species in Table 3.4-2 are not expected to occur in the project site based on the specific microhabitat conditions and geographic range. Blooming-period surveys for special-status plants have not been conducted within the project site.

- Large-flowered fiddleneck (*Amsinckia grandiflora*)—federally and state listed as endangered, CRPR 1B.1
- Alkali milk-vetch (*Astragalus tener* var. *tener*)—CRPR 1B.2
- Brittlescale (*Atriplex depressa*)—CRPR 1B.2
- Lesser saltscale (*Atriplex minuscula*)—CRPR 1B.2
- Big-scale balsamroot (*Balsamorhiza macrolepis*)—CRPR 1B.2
- Big tarplant (*Blepharizonia plumosa*)—CRPR 1B.1
- Lemmon's jewelflower (*Caulanthus lemmonii*)—CRPR 1B.2
- Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)—CRPR 1B.2
- Livermore tarplant (*Deinandra bacigalupii*)—state listed as endangered, CRPR 1B.1
- Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*)—CRPR 1B.2
- Diamond-petaled California poppy (*Eschscholzia rhombipetala*)—CRPR 1B.1
- San Joaquin spearscale (*Extriplex joaquiniana*)—CRPR 1B.2
- Showy golden madia (*Madia radiata*)—CRPR 1B.1
- Shining navarretia (*Navarretia nigelliformis* ssp. *radians*)—CRPR 1B.2
- California alkali grass (*Puccinellia simplex*)—CRPR 1B.2
- Long-styled sand-spurrey (*Spergularia macrotheca* var. *longistyla*)—CRPR 1B.2
- Caper-fruited tropidocarpum (*Tropidocarpum capparideum*)—CRPR 1B.1

Large-Flowered Fiddleneck

Potential habitat for large-flowered fiddleneck occurs in the sloping grasslands throughout the project site. There is an extant CNDDB occurrence approximately 1.7 miles southeast of the project site and an extirpated occurrence approximately 1 mile south of the project site (California Department of Fish and Wildlife 2020b). The extant occurrence is in the large-flowered fiddleneck's critical habitat (50 FR 19374–19378). According to the amendment to the species' recovery plan, the naturally occurring population was absent in 2017, but two introduced populations had a combined total of 132 plants in 2017 at the site (U.S. Fish and Wildlife Service 2020a). Based on the presence of potential habitat in the project site, the potential for large-flowered fiddleneck to be present in the project site is moderate to high.

Alkali Milk-Vetch

Potential habitat for alkali milk-vetch occurs in wetlands and streams in the project site. There is a single CNDDB record for an alkali milk-vetch occurrence approximately 5 miles west of the project site. The occurrence is considered possibly extirpated (California Department of Fish and Wildlife 2020b). The location of the occurrence is the "east end of Livermore Valley" and the occurrence was mapped in an area where soil survey maps have alkaline soils. Collections were made at this locale in 1891, 1892, 1938, and 1958. In 2002, no habitat or alkali milk-vetch was observed in 2002 along

Greenville Road in eastern Livermore; however, more fieldwork is needed to determine the status of the occurrence (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for alkali milk-vetch to be present in the project site is moderate.

Brittlescale

Potential habitat for brittlescale is located in alkaline soils of the nonnative annual grassland in the project site. Two CNDDB records for occurrences of brittlescale, both considered exact and within the last 20 years, are located 4.6 miles west and 3.3 miles northwest of the project site (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for brittlescale to be present in the project site is moderate to high.

Lesser Saltscale

Potential habitat for lesser saltscale in the project site is located in mesic areas with alkaline soils in wetlands and nonnative annual grassland. Four CNDDB records for lesser saltscale occur within 5 miles of the project site; the closest occurrence is approximately 3.6 miles northwest of the project site (California Department of Fish and Wildlife 2020b). All four of the CNDDB occurrences are presumed extant and less than 29 years old. Based on the presence of potential habitat in the project site, the potential for lesser saltscale to be present in the project site is moderate to high.

Big-Scale Balsamroot

Potential habitat for big-scale balsamroot in the project site is located on rocky hillsides with nonnative annual grassland. There is one occurrence for a big-scale balsamroot approximately 4.3 miles southwest of the project site, but it is considered extirpated because of golf course development at the occurrence (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for big-scale balsamroot to be present in the project site is moderate to high.

Big Tarplant

Nonnative annual grassland in the project site provides potential habitat for big tarplant. There are 17 big tarplant CNDDB occurrences within 5 miles of the project site (California Department of Fish and Wildlife 2020b). All of the CNDDB occurrences are considered extant, but one occurrence is from 1932, and more field work is needed. The closest occurrence is 0.4 mile east of the project site on the other side of Pacific Gas and Electric Company's (PG&E) Tesla substation. Based on the presence of potential habitat in the project site and nearby known occurrences, the potential for big tarplant to be present in the project site is moderate to high.

Lemmon's Jewelflower

Potential habitat for Lemmon's jewelflower in the project site is located in the rolling hills on dry exposed slopes. There are two CNDDB records for occurrences that are 0.7 mile southeast and 1.4 miles south of the project site. Both occurrences are considered extant but were mapped as a best guess from collections made from 1930s through 1950s (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for Lemmon's jewelflower to be present in the project site is moderate to high.

Congdon's Tarplant

Potential habitat for Congdon's tarplant in the project site consists of lower slopes, flats, and swales with alkaline or saline substrates in nonnative annual grassland. There is one record for an occurrence of Congdon's tarplant approximately 3.7 miles west of the project site (California Department of Fish and Wildlife 2020b). The record is from 2004 and is presumed extant. Based on the presence of potential habitat in the project site, the potential for Congdon's tarplant to be present the project site is moderate to high.

Livermore Tarplant

Potential habitat for Livermore tarplant in the project site consists of the alkaline soils in nonnative annual grassland. There are two records for occurrences of Livermore tarplant that are approximately 4.5 and 4.9 miles west of the project site (California Department of Fish and Wildlife 2020b). The occurrences are considered extant and are less than 16 years old; a brittlescale occurrence overlaps with one of the Livermore tarplant occurrences. Based on the presence of potential habitat in the project site, the potential for Livermore tarplant to be present in the project site is moderate.

Hospital Canyon Larkspur

The riparian land cover on the slopes above Patterson Creek provide suitable habitat for Hospital Canyon larkspur. There is one record for an occurrence of Hospital Canyon larkspur from 2009 that is located 2.4 miles south of the project site (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for Hospital Canyon larkspur to be present in the project site is moderate to high.

Diamond-Petaled Poppy

Potential habitat for diamond-petaled poppy in the project site is located in areas with clay soils and sparse vegetation coverage in nonnative annual grassland. There are four records for diamond-petaled poppy occurrences within 5 miles of the project site (California Department of Fish and Wildlife 2020b). The closest occurrence is approximately 0.5 mile southeast of the project site. Based on the presence of potential habitat in the project site, the potential for diamond-petaled poppy to be present in the project site is moderate to high.

San Joaquin Spearscale

Potential habitat for San Joaquin spearscale in the project site is located in areas with alkaline soils in nonnative annual grassland. Seven records for occurrences of San Joaquin spearscale are located within 5 miles of the project site; the closest occurrence is 2.3 miles northwest of the project site (California Department of Fish and Wildlife 2020b). All of the occurrences are considered extant and are less than 30 years old. Based on the presence of potential habitat in the project site, the potential for San Joaquin spearscale to be present in the project site is moderate to high.

Showy Golden Madia

Potential habitat for showy golden madia in the project site is located on the rolling hills of nonnative annual grassland. There is one record for a showy golden madia occurrence approximately 4.5 miles southeast of the project site (California Department of Fish and Wildlife 2020b). While the occurrence is considered extant, it is based on a 1922 collection, and the exact location is unknown. Based on the presence of potential habitat in the project site, the potential for showy golden madia to be present in the project site is moderate.

Shining Navarretia

Wetlands and mesic areas consisting of clay soils provide potential habitat for shining navarretia in the project site. There are two occurrences for shining navarretia within 5 miles of the project site; one occurrence is 3.2 miles north and the other is southeast adjacent to the project site (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for shining navarretia to be present in the project site is moderate to high.

California Alkali Grass

Wetlands and streams in the project site provide potential habitat for California alkali grass. There is one record for a California alkali grass occurrence from 1958 that is approximately 2.5 miles northwest of the project site (California Department of Fish and Wildlife 2020b). The location is not exact and is recorded as being in the vicinity of Altamont and Altamont Pass. Based on the presence of potential habitat in the project site, the potential for California alkali grass to be present in the project site is moderate.

Long-Styled Sand-Spurrey

Nonnative annual grassland and aquatic features in the project site provide potential habitat for long-styled sand-spurrey. There are three historic (from the 1930s) records for long-styled sand-spurrey occurrences within 5 miles of the project site; all three occurrences are presumed extant (California Department of Fish and Wildlife 2020b). The closest occurrence is approximately 1.7 miles northeast of the project site. Based on the presence of potential habitat in the project site, the potential for long-styled sand-spurrey to be present in the project site is moderate to high.

Caper-Fruited Tropidocarpum

Nonnative grassland in the project site provides potential habitat for caper-fruited tropidocarpum. There are five records for caper-fruited tropidocarpum occurrences within 5 miles of the project site; all of these occurrences are historic, and the species has not been detected during recent surveys (California Department of Fish and Wildlife 2020b). Based on the presence of potential habitat in the project site, the potential for caper-fruited tropidocarpum to be present in the project site is moderate.

Special-Status Wildlife

Based on a review of the CNDDB (California Department of Fish and Wildlife 2020b), the unofficial USFWS species list (U.S. Fish and Wildlife Service 2020a), the PEIR (Alameda County Community Development Agency 2014), and the EACCS (ICF International 2010), as well as other environmental documents prepared for recent repowering projects near the project site, ~~39~~44 special-status wildlife species were identified as having the potential to occur in the project vicinity (Table 3.4-3 at the end of Section 3.4.1).

Of the ~~39~~ species identified and included in Table 3.4-3, eight are not expected to occur within the project site because the project site is outside of the species' known geographic range or there is little to no suitable habitat in the project site (Table 3.4-3). These species are not expected to occupy the project site and are not discussed further in this document.

Other special-status birds may migrate through or forage in the project site but are not expected to nest within the project site. As such, these species are not addressed specifically in this SEIR but are addressed generally under migratory birds subject to operational effects. Such species are relevant to and part of this analysis to the extent they have been identified through postconstruction ~~mortality~~fatality studies in the APWRA.

Based on an assessment of existing conditions, habitats in the project site have the potential to support the following ~~31~~36 special-status wildlife species. Suitable habitat within the project site and local occurrence information for these species is discussed in the following subsections and relies heavily on information contained in the Biological Resources Report prepared for the project (ICF 2020a). Some similar or closely related species are discussed jointly. Detailed species accounts describing geographic distribution and habitat requirements are contained in the PEIR. Special-status wildlife species observations made during the field surveys are depicted on Figures 3.4-2a and 3.4-2b.

- Vernal pool fairy shrimp (*Branchinecta lynchi*)—federally listed as threatened
- Vernal pool tadpole shrimp (*Lepidurus packardi*)—federally listed as endangered
- Curved-foot hygrotus diving beetle (*Hygrotus curvipes*)—considered rare under CEQA
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)—federally listed as threatened
- Western bumble bee (*Bombus occidentalis occidentalis*)—state candidate endangered
- Monarch butterfly (*Danaus plexippus*)—federal candidate species
- California tiger salamander (*Ambystoma californiense*)—state and federally listed as threatened
- California red-legged frog (*Rana draytonii*)—federally listed as threatened
- Western spadefoot toad (*Spea hammondii*)—CDFW species of special concern
- Western pond turtle (*Actinemys marmorata*)—CDFW species of special concern
- San Joaquin coachwhip (*Masticophis flagellum ruddocki*)—CDFW species of special concern
- Alameda whipsnake (*Masticophis lateralis euryxanthus*)—state and federally listed as threatened
- Blainville's horned lizard (*Phrynosoma blainvillii*)—CDFW species of special concern
- California glossy snake (*Arizona elegans occidentalis*)—CDFW species of special concern
- White-tailed kite (*Elanus leucurus*)—California fully protected
- Northern harrier (*Circus cyaneus*)—CDFW species of special concern
- Swainson's hawk (*Buteo swainsoni*)—state-listed as threatened
- Golden eagle (*Aquila chrysaetos*)—CDFW species of special concern and fully protected, federal Bald and Golden Eagle Protection Act
- Bald eagle *(Haliaeetus leucocephalus)*—state listed as endangered and fully protected, federal Bald and Golden Eagle Protection Act
- ~~Sandhill~~Greater sandhill crane *(Antigone canadensis)*—state listed as endangered and fully protected

- California condor *(Gymnogyps californianus)*—state and federally listed as endangered, state fully protected
- Short-eared owl (*Asio flammeus*)—CDFW species of special concern
- Long-eared owl (*Asio otus*)—CDFW species of special concern
- Western burrowing owl (*Athene cunicularia*)—CDFW species of special concern
- Loggerhead shrike (*Lanius ludovicianus*)—CDFW species of special concern
- Tricolored blackbird (*Agelaius tricolor*)—state-listed as threatened
- Grasshopper sparrow (*Ammodramus savannarum*)—CDFW species of special concern
- Yellow-breasted chat (*Icteria virens*)—CDFW species of special concern
- Yellow warbler (*Dendroica petechia*)—CDFW species of special concern
- Vaux's swift (*Chaetura vauxi*)—CDFW species of special concern
- Little brown bat (*Myotis lucifugus*)—WBWG medium priority
- Western red bat (*Lasiurus blossevillii*)—CDFW species of special concern; WBWG high priority
- Hoary bat (*Lasiurus cinereus*)—WBWG medium priority
- Pallid bat (*Antrozous pallidus*)—CDFW species of special concern; WBWG high priority
- American badger (*Taxidea taxus*)—CDFW species of special concern
- San Joaquin kit fox (*Vulpes macrotis mutica*)—state-listed as threatened and federally endangered

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp (collectively referred to as vernal pool branchiopods) in the project site consists of two vernal pools, small ephemeral ponds, and seasonal alkali wetlands (Figures 3.4-2a and 3.4-2b). There are no CNDDB records for occurrences of vernal pool fairy shrimp or vernal pool tadpole shrimp within the project site (California Department of Fish and Wildlife 2020b) and no protocol-level surveys have been conducted for the project. There are two records for occurrences of vernal pool fairy shrimp approximately 5 miles from the project site; there are no vernal pool tadpole shrimp occurrences within 5 miles (California Department of Fish and Wildlife 2020b).

The project site is not located within designated critical habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp (71 FR 7171–7182, 7195–7210).

Curved-Foot Hygrotus Diving Beetle

Suitable habitat for curved-foot hygrotus diving beetle in the project site consists of two vernal pools, small ephemeral ponds, and seasonal alkali wetlands (Figures 3.4-2a and 3.4-2b). There are eight CNDDB records for occurrences of curved-foot hygrotus diving beetle within 5 miles of the project site (California Department of Fish and Wildlife 2020b). All of the occurrences are located 4 to 5 miles north and northwest of the project site.

Valley Elderberry Longhorn Beetle

Riparian habitat supporting 36 blue elderberry shrubs is present in the project site and provides suitable habitat for valley elderberry longhorn beetle (Figures 3.4-2a and 3.4-2b). There are two CNDDB records for occurrences of valley elderberry longhorn beetle that are approximately 2 and 4 miles southeast of the project site (California Department of Fish and Wildlife 2020b).

Western Bumble Bee

Nonnative annual grassland with flowering plants in the project site provide suitable habitat for western bumble bee. There is one CNDDB record for an occurrence of western bumble bee collected between 1946 and 1951, located approximately 2 miles south of the project site (California Department of Fish and Wildlife 2020b). Based on the presence of suitable habitat in the project site and nearby known occurrences, western bumble bees could forage over or occupy small mammal burrows in the project site.

Monarch Butterfly

A petition to list Monarch butterfly was submitted to USFWS in August 2014. On December 15, 2020, the USFWS announced that listing the monarch as endangered or threatened under the ESA is warranted but precluded by higher priority listing actions. The Monarch butterfly is now designated as a candidate for listing under ESA and its status will be reviewed annually until a listing decision is made.

Historical records suggest that fall-migrating western Monarch butterflies often follow riparian and stream corridors, presumably because these areas provide a reliable water and food source, supporting nectar-producing flowers (Western Association of Fish and Wildlife Agencies 2019). After overwintering along the California coast, adult monarch butterflies begin their spring migration east and northward through the project site, where some will breed, depositing eggs on available milkweed plants (larval host plant). Milkweed is the only plant monarch caterpillars can eat to grow and develop into adults. In 2017, the Xerces Society initiated a web-based public reporting system to track monarch butterfly observations, breeding, and presence of milkweed (Western Monarch Milkweed Mapper 2020). While there are only a few recorded observations of larval and adult monarch butterflies observed within the APWRA, this area is not generally open to the public, and there are limited opportunities to record monarch observations. It is likely that monarchs migrate through the project site, particularly along Paterson Pass Creek. Milkweed plants are sporadically scattered throughout the project site but are not abundant. Based on the presence of milkweed and other flowering plants, there is a potential for monarch butterflies to forage and breed on the project site.

California Tiger Salamander

Based on a 2019 California tiger salamander and California red-legged frog site assessment conducted for the project, 18 ponds (four of the ponds are within mapped emergent marsh and alkali wetland habitats) in the project site provide suitable breeding habitat for California tiger salamander (ICF 2019b). Nonnative annual grassland throughout the project site provides suitable upland (dispersal and estivation) habitat for California tiger salamander. There are two CNDDB records for occurrences of California tiger salamander in the project site and numerous additional occurrences within 5 miles of the project site (California Department of Fish and Wildlife 2020b). Therefore, all grasslands within the project site would be presumed occupied since they are within

1.24 miles of a known breeding location. The project site is not located within designated critical habitat for California tiger salamander (70 FR 49418–49458).

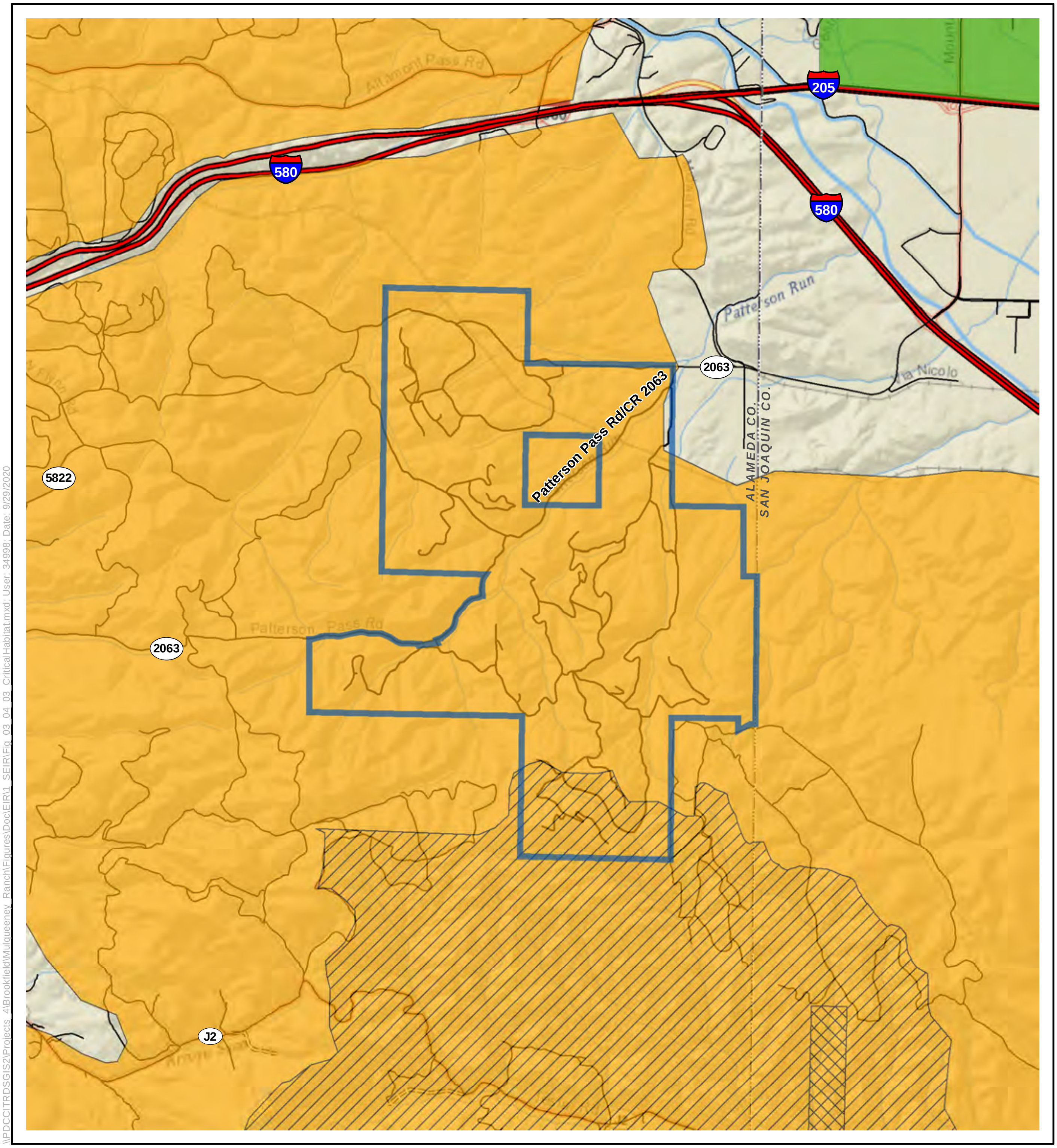
California Red-Legged Frog

Based on a 2019 California tiger salamander and California red-legged frog site assessment conducted for the project, 14 ponds (two of the ponds are within mapped emergent marsh and alkali wetland habitats) in the project site provide suitable breeding habitat for California red-legged frog (ICF 2019b). Freshwater marsh, riparian, scrub-shrub wetland, and intermittent stream habitats throughout the project site represent suitable nonbreeding aquatic habitat for California red-legged frog. Ephemeral streams and some alkali wetlands only flow during rain events and do not provide suitable nonbreeding habitat for California red-legged frog. Nonnative annual grassland throughout the project site provide suitable upland (dispersal and estivation) habitat for California red-legged frog. California red-legged frogs may also use alkali wetlands and intermittent streams throughout the project site for dispersal and foraging. California red-legged frog was detected (observed or heard) at three ponds in the project site during the 2019 site assessment surveys (Figures 3.4-2a and 3.4-2b). There are three CNDDB records for occurrences of California red-legged frog in the project site and numerous additional occurrences within 5 miles of the project site (California Department of Fish and Wildlife 2020b).

The entire project site is within critical habitat unit ALA-2 for California red-legged frog (75 FR 12912) (Figure 3.4-3). Primary constituent elements of designated critical habitat for this species are listed below.

- Aquatic breeding habitat (ponds, streams, wetlands).
- Aquatic nonbreeding (e.g., freshwater features not suitable for breeding) and riparian habitat.
- Upland habitats associated with riparian and aquatic habitat that provide food and shelter.
- Dispersal habitat (i.e., accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within 1 mile of each other, and that do not contain barriers to dispersal such as heavily traveled roads without bridges or culverts).

The project site contains all four of the primary constituent elements of designated critical habitat.



Project Boundary
County Boundary
Primary Road
Local Road
Vehicular Trail (4WD)

Critical Habitat
Alameda whipsnake
California red-legged frog
Delta smelt
Large-flowered fiddleneck

Source: USFWS 2019

N

0 2,000 4,000
Feet
1:64,000

Figure 3.4-3
Critical Habitat within the Mulqueeney Ranch Repowering Project Area

Western Spadefoot Toad

Ponds in the project site that are seasonally ponded represent suitable breeding habitat for western spadefoot toad (Figures 3.4-2a and 3.4-b). Nonnative annual grassland throughout the project site provides suitable upland (dispersal and estivation) habitat for the species. There are 10 CNDDB records for western spadefoot toad within 5 miles of the project site (California Department of Fish and Wildlife 2020b). The closest occurrence is from 2017 and is approximately 0.5 mile southwest of the project site.

Western Pond Turtle

Perennial ponds and seasonal ponds (when they contain water) in the project site represent suitable aquatic habitat for western pond turtle. Nonnative annual grassland adjacent to ponds provides potential nesting habitat for pond turtles. If pond turtles are present, they could deposit eggs in the nearby grassland habitat. There are eight CNDDB records for western pond turtle within 5 miles of the project site (California Department of Fish and Wildlife 2020b). The closest occurrence is approximately 1.6 miles south of the project site.

California Glossy Snake and San Joaquin Coachwhip

Nonnative annual grassland, scrub, and rock outcrops in the project site provide suitable habitat for California glossy snake and San Joaquin coachwhip. These species commonly use rocky areas and small mammal burrows for refuge, which are abundant in the project site. There are two CNDDB records for California glossy snake in the project site and 10 additional records within 5 miles of the project site (California Department of Fish and Wildlife 2020b). There are four CNDDB records for San Joaquin coachwhip within 5 miles of the project site and the closest is 0.5 mile to the northeast (California Department of Fish and Wildlife 2020b).

Alameda Whipsnake

The project site is within the range of Alameda whipsnake, currently defined as Contra Costa County, most of Alameda County, and small portions of northern Santa Clara and western San Joaquin Counties (U.S. Fish and Wildlife Service 2020b). There is low potential for Alameda whipsnake to be present in the project site based on the types of habitat present. There is no chaparral and very limited scrub habitat in the project site. Most of the project site is comprised of annual grassland. A few patches of scrub are located along Patterson Run (intermittent stream) in the western and central portion of the project site. The nearest abundant scrub habitat is approximately 1 mile south of the project. Alameda whipsnakes typically inhabit grassland habitats when they are within approximately 500 feet of scrub/shrub vegetation communities (U.S. Fish and Wildlife Service 2006). Because scrub/shrub habitat within the project site occupies only a small portion of the overall project site (5.5 acres of about 4,600 acres), and the nearest suitable scrub habitat is approximately 1 mile south of the project site, the likelihood of Alameda whipsnake presence in the project site is considered low.

A 368-acre area in the southern portion of the project site is Alameda whipsnake critical habitat (U.S. Fish and Wildlife Service 2006) (Figure 3.4-3). Primary constituent elements of Alameda whipsnake critical habitat as defined by USFWS (2006) generally include:

- Scrub/shrub communities with a mosaic of open and closed canopy (characterized by chamise, chamise-eastwood manzanita [*Arctostaphylos glandulosa*], chaparral, whitethorn [*Ceanothus* sp.], and interior live oak [*Quercus wislizeni*] shrub vegetation).

- Woodland or annual grassland plant communities contiguous to lands containing scrub/shrub communities with a mosaic of open and closed canopy.
- Habitat features such as small mammal burrows, rock outcrops, talus, and other forms of cover to provide temperature regulation, shelter from predators, egg laying sites, and winter hibernaculum.

The project site contains two of the three of the primary constituent elements of designated critical habitat. While the project site has annual grassland that is contiguous with scrub/shrub communities 1 mile south of the project site, rock outcrops, and small mammal burrows, it does not have scrub/shrub communities with a mosaic of open and closed canopy. Additionally, none of the scrub habitat along Patterson Creek is located within designated critical habitat (Figure 3.4-3).

There are no known occurrences of Alameda whipsnake in the project site and no suitable scrub/shrub habitat or known occurrences within 5 miles of the project site to the north, west, and east (California Department of Fish and Wildlife 2020b). There are seven CNDDB records for Alameda whipsnake within open grasslands and oak woodlands located between 0.75 and 1.6 miles south of the project site (California Department of Fish and Wildlife 2020b). Occurrence data for these CNDDB records indicates that the snakes found in this area could be hybrids (cross between Alameda whipsnake and the common California whipsnake); however, they would still have the same protections as the listed Alameda whipsnake.

Blainville's Horned Lizard

Nonnative annual grassland and scrub in the project site represent suitable habitat for Blainville's horned lizard. Blainville's horned lizard is associated with areas where there is loose or sandy soil and abundant harvest ant colonies for food. There are 12 CNDDB records for Blainville's horned lizard within 5 miles of the project site and the closest is approximately 700 feet to the southeast (California Department of Fish and Wildlife 2020b).

White-Tailed Kite and Swainson's Hawk

Suitable nesting habitat for white-tailed kite and Swainson's hawk in the project site is limited to willows and oaks along Patterson Creek, Peruvian pepper trees (*Schinus mole*) associated with a small house and cattle holding area, and a few scattered trees in the northeastern portion of the project site. Although not typical nesting sites, Swainson's hawk and white-tailed kites could also nest on electrical transmission towers located throughout the project site. Nonnative annual grassland throughout the project site is densely populated with small rodents (e.g., ground squirrels, voles, mice) that provide abundant prey for raptors including white-tailed kite and Swainson's hawk.

In 2020, ICF biologists conducted raptor nest surveys throughout the project site and identified four active raptor nests and 12 unoccupied raptor stick nests located in transmission towers and trees within and immediately adjacent to the project site (ICF 2020b). One Swainson's hawk territory was observed around a nest structure in a cottonwood tree (Figure 3.4-2a) and ICF biologists conducted several visits to monitor the nest structure for activity. On May 13, 2020, the nest structure was occupied by a single adult Swainson's hawk. During a subsequent survey on May 29, 2020, biologists observed a Swainson's hawk pair perched in and around the nest and displaying territorial behavior (i.e., defending the nest from a red-tailed hawk). The nest was revisited on June 8, 2020 and the biologists did not observe any Swainson's hawk activity in or around the nest and the nest appeared to be in poor condition. The biologists conducted a final monitoring visit on June 30, 2020 and found that only few small sticks remained where the nest was formerly located and no raptor activity in the vicinity. The remaining active raptor nests that were documented in the project site during the 2020 surveys consisted of two red-tailed hawk nests located in transmission towers. Also, a red-tailed hawk nest and a great-horned owl nest were observed within several hundred feet but just outside the project boundaries. Two active raven nests were also observed in the project site during the raptor surveys. Ravens are not considered raptor species, but they are large birds that occupy nests often used by raptors. There are three CNDDB records for nesting white-tailed kite within 5 miles of the project site and the closest known nest is 0.65 mile south of the project site (California Department of Fish and Wildlife 2020b). There are six CNDDB records for nesting Swainson's hawk between 4 and 5 miles northeast of the project site (California Department of Fish and Wildlife 2020b).

Golden Eagle

Large rock outcrops, transmission towers, and large isolated trees on the project site provide suitable nesting habitat for golden eagle. Golden eagles in Alameda County have also been reported to nest in suboptimal habitat such as small trees and on the ground. No active golden eagle nests were documented during the 2020 raptor nest surveys conducted by ICF within the project site. However, U.S. Geological Survey (USGS) found an active golden eagle nest on the project site in 2020, which subsequently was determined to have failed during a follow-up survey in June 2020. USGS has conducted golden eagle population monitoring within the Altamont Pass region (including the project site) for several years, which included occupancy surveys in 2014–2016 and 2018–2020. These surveys have documented ~~six~~seven territories (nests and pair activity centers) within 2 miles of the project site (ICF 2020b).

Bald Eagle

The project site does not support suitable nesting or foraging habitat (large lakes, reservoirs, or rivers) for bald eagles, which prey largely on fish. The nearest potential foraging habitat is located approximately 4 miles to the north at Bethany Reservoir. One bald eagle was observed flying over the project site in January 2020 during the 2019/2020 eagle use surveys ~~(ICF 2020b).~~and 7 observations of bald eagle were made during the 2019/2020 avian use surveys (ICF 2020b). Bald eagle nests have not been previously detected within 2 miles of the project site during USGS golden eagle occupancy surveys and are not expected to nest on the project site.

Sandhill Crane

The project site is not located within the breeding range of sandhill crane and does not support suitable foraging habitat for sandhill cranes that winter in the Central Valley. One sandhill crane was detected flying over the project site during field surveys conducted in May 2020 (ICF 2020b). The bird was flying at a high altitude (more than 600 feet) and was not identifiable to subspecies. Sandhill cranes are not expected to occupy the project site and are not discussed further.

California Condor

One California condor was observed on August 12, 2019 during the golden eagle use surveys (ICF 2020b). The individual was observed soaring at a height of approximately 75–90 feet. Distinguishing features of the condor that was observed included long, splayed primaries ("fingers"); large, bald pink patch directly below the head (most likely its neck tucked in); large, gray feet that were obviously larger than a turkey vulture or golden eagle; and distinctive large size. These characteristics indicated it was neither a turkey vulture nor a golden eagle. The condor soared over the southern portion of the project site opposite and chased a coyote for approximately 2–3 minutes. The bird then flew south of the project site and disappeared out of sight over the adjacent hills. No wing tags were observed on the condor. Condors can fly long distance in search of food and are known to fly 150 miles in a day (U.S. Fish and Wildlife Service 2020c). The project site does not support suitable nesting habitat for condors; however, there is a potential for incidental foraging. Although a condor was detected during project surveys, overall observations of condors in the APWRA are rare and a future range expansion into the project site is ~~speculative. Overall, California condors are not expected to occupy or frequent the project site and are not discussed further.~~highly uncertain. Nonetheless, because of the extraordinary importance of California condors in the Diablo Range and their continued recovery as a native species, some potential for a blade strike and fatality has to be recognized, regardless of how remote such an event could be.

Northern Harrier and Short-Eared Owl

Areas of tall, dense grasses in nonnative annual grassland and emergent wetland vegetation associated with freshwater marsh provide suitable nesting substrates for northern harrier in the project site. Short-eared owls commonly nest in elevated areas on small knolls, ridges, or hummocks. Nonnative grassland throughout the project site is populated with small rodents that provides abundant prey for northern harrier and short-eared owl. The closest CNDDB nest record for northern harrier is 2 miles northeast of the project site and the closet CNDDB nest record for short-eared owl is 500 feet east of the project site (California Department of Fish and Wildlife 2020b). Northern harrier was not observed during the 2019–2020 avian use surveys conducted on the project site but was observed during October 2019 terrestrial surveys and the 2019–2020 eagle use surveys (ICF 2020a). Short-eared owl was not observed during any of the project survey efforts.

Burrowing Owl

Nonnative annual grassland throughout the project site provides suitable nesting, wintering, and foraging habitat for western burrowing owl. During summer 2019 field surveys, burrowing owls were observed in the northwestern portion of the project site (Figures 3.4-2a and 3.4-2b) and were presumed to be using this area for breeding since several burrows in the area had evidence of recent burrowing owl use (white wash, feathers, and pellets). Burrowing owls were also observed on numerous occasions throughout the project site during 2020 field surveys. There are six CNDDB records for burrowing owl within the project site and numerous additional records within 5 miles of the project site (California Department of Fish and Wildlife 2020b). Based on numerous studies conducted throughout the larger APWRA, there is an abundant population of burrowing owls within the APWRA and their distribution is considered to be dynamic and clustered (Smallwood et al. 2011). There are abundant ground squirrel burrows throughout the project site that provide suitable nest and refuge sites for burrowing owl and the location of burrowing owl nesting locations on the project site is expected to change from year to year.

No focused burrowing owl surveys were performed on the project site. However, lands adjacent to the project on the north and northwest have been established as conservation for the burrowing owl, and the 156-acre Two Sisters Burrowing Owl Preserve is entirely surrounded by the project site. Figure 3.4-1 depicts habitat preserves in proximity to the project site. Proximity to these preserves shows a substantial likelihood that burrowing owls occur within the project site, but their location and numbers are unknown. In addition, ICF biologists observed burrowing owls in six locations during the avian use surveys conducted between June 2019 and June 2020. Surveys in May 2020 included recordation of two burrows that included whitewash, pellets, and feathers at burrow entrances, indicating that they were actively being used by burrowing owls.

Loggerhead Shrike

Suitable nesting habitat for loggerhead shrike in the project site is limited to shrubs and trees along Patterson Run, Peruvian pepper trees associated with a small house and cattle holding area, and a few scattered trees in the northeastern portion of the project site. Nonnative annual grassland throughout the project site provides suitable foraging habitat for loggerhead shrike. Loggerhead shrikes were observed several times during all seasons that avian use surveys were conducted between June 2019 and June 2020 (ICF 2020b). There are nine CNDDB records for loggerhead shrike within 5 miles of the project site; the closest occurrence is approximately 1 mile south of the project site (California Department of Fish and Wildlife 2020b).

Grasshopper Sparrow

Nonnative annual grassland throughout the project site provides suitable nesting and foraging habitat for grasshopper sparrow. There is one CNDDB record for grasshopper sparrow approximately 3.25 miles south of the project site (California Department of Fish and Wildlife 2020b). No grasshopper sparrows were observed during the avian use surveys conducted on the project site between June 2019 and June 2020 (ICF 2020b).

Long-eared owl and Vaux's Swift

Densely wooded areas suitable for nesting long-eared owls and Vaux's swift are not present on the project site; however, these could migrate through and forage on the project site. Neither species was detected during avian use surveys conducted on the project site between June 2019 and June 2020 (ICF 2020b). Both species have been infrequently found during avian fatality surveys in the APWRA.

Yellow Warbler and Yellow-Breasted Chat

Riparian woodlands on the project site provide limited nesting habitat for yellow warbler and yellow-breasted chat. Where riparian woodlands are present, they do not provide the dense multi-layered characteristics typically inhabited by the species. However, yellow warblers and yellow-breasted chats could migrate through and forage on the project site. Both species are infrequently found during avian fatality surveys in the APWRA.

Tricolored Blackbird

Large patches of freshwater marsh in the project site provide suitable nesting habitat for tricolored blackbirds. Nonnative annual grassland and aquatic habitats throughout the project site provide suitable tricolored blackbird foraging habitat. A small flock of tricolored blackbirds was observed foraging near a cattle holding area within the project site during the October 2019 field surveys.

~~CDFW conducted~~Two tricolored blackbird nesting ~~season surveys in 2018 and 2019 in the vicinity of~~ colonies were documented near the project site in 2018 and 2019 and ~~identified two tricolored nesting colonies~~ reported to CDFW (California Department of Fish and Wildlife 2020b). Each colony consisted of approximately 50 individuals~~,~~ and were located 0.25 mile and 0.60 mile south of the project site (ICF 2020b). ICF biologists conducted tricolored blackbird surveys on the project site on May 13 and June 26, 2020. The biologists observed a flock of approximately 50 tricolored blackbirds calling and displaying territorial behavior at a pond in the southern portion of the project site during the May survey but did not observe any tricolored blackbirds at this location during the June survey. The pond and adjacent alkali wetland habitat provide suitable nesting and foraging habitat for tricolored blackbirds. Tricolored blackbirds were also observed during the avian use surveys in the vicinity of Patterson Pass Creek in spring 2020.

Little Brown Bat and Pallid Bat

Some of the rock outcrops in the project site have crevices that may provide suitable roosting habitat for little brown bat or pallid bat. Pallid bats would require larger crevices due to their larger size. Little brown bat and pallid bat could forage throughout the project site and drink over ponds and Patterson Creek. There are no CNDDB records for little brown bat within 5 miles of the project site, and there is one pallid bat CNDDB record approximately 4.5 miles from the project site (California Department of Fish and Wildlife 2020b). Little brown bat has been documented during fatality surveys at other wind facilities in the APWRA (H.T. Harvey & Associates 2020; ICF 2016). Pallid bat has not been documented during fatality surveys at other wind facilities in the APWRA.

Western Red Bat and Hoary Bat

Western red bat and hoary bat could roost in riparian habitat along Patterson Creek or in other groups of trees in the project site. Western red bat and hoary bat could forage throughout the project site and drink over ponds and Patterson Creek. Both species may also migrate through the project site during spring and fall migrations. There are no CNDDB records for western red bat or hoary bat within 5 miles of the project site (California Department of Fish and Wildlife 2020b). Western red bat has been documented during fatality surveys at other wind facilities in the APWRA, with most fatalities occurring during the seasonal migrations (H.T. Harvey & Associates 2020; Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a; ICF 2016; Ventus Environmental Solutions 2016). Hoary bat has also been documented during fatality surveys at other wind facilities in the APWRA, also with most fatalities occurring during seasonal migrations, especially the fall migration (H.T. Harvey & Associates 2020; Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a; ICF 2016; Ventus Environmental Solutions 2016; Insignia Environmental 2012).

American Badger

Nonnative annual grassland throughout the project site provides suitable habitat for American badger. Numerous burrows are present in the project site that provide suitable denning habitat. There are three CNDDB records for occurrences of American badger in the project site and 14 additional occurrences within 5 miles of the project site (California Department of Fish and Wildlife 2020b). Based on the presence of suitable habitat in the project site and records for past occurrences in the project site, there is a high potential for American badger to be present in the project site.

San Joaquin Kit Fox

The project site is within the northern range of San Joaquin kit fox. The northern range of San Joaquin kit fox includes a narrow band of habitat along the western edge of the San Joaquin Valley from San Luis Reservoir in western Merced County north to central Alameda and Contra Costa

Counties (linkage corridor) that is generally characterized by highly fragmented habitat of low suitability. Based on current habitat conditions, the northern range is unlikely to support a population of San Joaquin kit foxes (Cypher et al. 2013). Evidence indicates that San Joaquin kit foxes north of Santa Nella either occur at extremely low densities or, more likely, are only intermittently present (Constable et al. 2009). Suitable denning, foraging, and dispersal habitat for San Joaquin kit fox is present in nonnative annual grassland throughout the project site. Numerous burrows of sufficient size for kit fox use are present in the project site. There is one CNDDB record from 1975 for San Joaquin kit fox within the project site and 17 additional historical (1973–1998) records within 5 miles of the project site (California Department of Fish and Wildlife 2020b). Since 1998, the population structure of San Joaquin kit fox has become more fragmented, with some resident satellite populations (particularly in the northern range) having been locally extirpated (U.S. Fish and Wildlife Service 2010). Although there is suitable habitat in the project site and known occurrences in and near the project site, the lack of recent sightings in the region and the extent of habitat fragmentation in the northern portion of the species' range reduces the potential for San Joaquin kit fox to be present in the project site.

Non–Special-Status Wildlife

Migratory Birds

Non–special-status ground-nesting migratory birds have the potential to nest and forage in the project site. Although more limited, trees and shrubs in the project site provide suitable habitat for tree- and shrub-nesting birds. Electrical towers in the project site also provide suitable nesting habitat for raptors. Avian use surveys were conducted on the project site between June 2019 and June 2020. A total of 56 different bird species were detected during these surveys (ICF 2020b). The most commonly observed species during the spring were western meadowlark, red-winged black-bird, and horned lark. The most commonly observed species during the summer were western meadowlark and mourning dove. The most commonly observed species during the fall were western meadowlark, savannah sparrow, and European starling. The most commonly observed species during the winter were western meadowlark and common raven.

The breeding season for migratory birds generally extends from February through August, although nesting periods vary by species.

Other Bats Documented in the APWRA

Other special-status (not discussed above) and non–special-status bats have been documented during fatality surveys at other wind energy facilities in the APWRA. Special-status species that have been documented are western mastiff bat (*Eumops perotis*; considered high priority by the WBWG) and silver-haired bat (considered medium priority by the WBWG), and non–special-status species that have been documented are Mexican free-tailed bat, big brown bat, and California myotis. Western mastiff bat could roost in crevices and cracks in the rock outcrops in the project site. Western mastiff bat could forage throughout the project site and drink over ponds and Patterson Creek. While there are no CNDDB records for western mastiff bats within 5 miles of the project site, one western mastiff bat was recorded during fatality surveys in 2018 at the Golden Hills Wind Energy Center in the APWRA (H.T. Harvey & Associates 2020).

Silver-haired bat occurs primarily in the northernmost portion of California and at higher elevations in the southern and coastal mountain ranges (Brown and Pierson 1996) but may occur anywhere in California during their spring and fall migrations. As such, silver-haired bat would not establish maternity or winter roosts in the project site. Silver-haired bat could forage, drink, or night roost in the project site during spring and fall migrations. Although there are no CNDDB records for silver-haired bat within 5 miles of the project site, silver-haired bat has been recorded in the APWRA during fatality surveys (H.T. Harvey & Associates 2020; Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a).

Mexican free-tailed bat roosts in a variety of structures including caves, rock crevices on cliff faces, abandoned mines and tunnels, bridges, and large culverts (Western Bat Working Group 2017). Mexican free-tailed bats could roost in crevices and cracks in the rock outcrops in the project site. They could also forage throughout the project site and drink over ponds and Patterson Creek. Mexican free-tailed bat has been documented during fatality surveys at other wind facilities in the APWRA (H.T. Harvey & Associates 2020; Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a; ICF 2016; Ventus Environmental Solutions 2016; Insignia Environmental 2012).

Big brown bat is commonly found roosting in buildings, mines, and bridges, but it has also been found in caves and crevices in cliff faces. Big brown bat has also been documented roosting in large snags (Western Bat Working Group 2017). Big brown bats could roost in crevices and cracks in the rock outcrops in the project site. They could also forage throughout the project site and drink over ponds and Patterson Creek. Big brown bats have been recorded during fatality surveys in the APWRA (H.T. Harvey & Associates 2020; Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a).

California myotis has been found roosting alone or in small groups in caves, mines, buildings, rocky hillsides, and under tree bark during the summer. Individuals and small groups roost in caves, mines, and buildings in the winter (Western Bat Working Group 2017). Crevices in some rock outcrops in the project site may provide suitable roosting habitat for California myotis. This bat could also forage throughout the project site and drink over ponds and Patterson Creek. California myotis has been recorded during fatality surveys at other wind facilities in the APWRA (H.T. Harvey & Associates 2020; Ventus Environmental Solutions 2016; Insignia Environmental 2012).

Table 3.4-2. Special-Status Plants Known to Occur or with Potential to Occur within 5 Miles of the Mulqueeney Ranch Wind Repowering Project Site

Species	Status[a] Federal/ State/CRPR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Site[b]
Amsinckia grandiflora Large-flowered fiddleneck	E/E/1B.1	Foothills of Mount Diablo in Alameda, Contra Costa, and San Joaquin Counties; currently known from only three natural occurrences	Open grassy slopes in annual grasslands and cismontane woodlands	April–May	Moderate to High—suitable annual grassland habitat is present throughout the project site; species is known from 2 locations within 0.5 to 1 mile of the project site. Designated critical habitat for the species is approximately 1 mile northeast of the project site.
Astragalus tener var. *tener* Alkali milk-vetch	–/–/1B.2	Historically found in western San Joaquin Valley, San Francisco Bay Area, and Monterey County; likely extirpated from all historical occurrences except those in Merced, Solano, and Yolo Counties	Playas and grasslands with adobe clay soils and alkaline vernal pools	March–June	Moderate—suitable annual grassland and alkali habitats are present throughout the project site; species is known to occur approximately 5 miles west of the project site.
Atriplex depressa Brittlescale	–/–/1B.2	Western Central Valley and valleys in foothills on west side of Central Valley	Alkali grasslands, alkali meadows, alkali scrublands, chenopod scrublands, playas, valley and foothill grasslands; on alkaline or clay soils	May–October	Moderate to High—suitable annual grassland and alkali habitats are present throughout the project site; species is known from 2 locations 3.3 to 4.6 miles north to west of the project site.
Atriplex minuscula Lesser saltscale	–/–/1B.1	Sacramento and San Joaquin Valley, Butte County to Kern County	Alkali sink and sandy alkaline soils in grasslands, chenopod scrub	May–October	Moderate to High—suitable annual grassland and alkali habitats are present throughout the project site; species is known from 11 locations 3.6 to 4.5 miles north to west of the project site.

Species	Status[a] Federal/ State/CRPR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Site[b]
Balsamorhiza macrolepis Big-scale balsamroot	–/–/1B.2	Scattered occurrences in Coast Ranges and Sierra Nevada foothills.	Chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentine soils	March–June	Moderate to High—suitable annual grassland habitat within project site, no serpentine soils present; species is known to occur within 4.3 miles southwest of the project site.
Blepharizonia plumosa Big tarplant	–/–/1B.1	Interior Coast Range foothills in Alameda, Contra Costa, San Joaquin, Stanislaus,[c] and Solano[c] Counties	Dry hills and plains in annual grasslands	July–October	Moderate to High—suitable annual grassland habitat in the project site; species is known from 9 locations 0.4 to 2.4 miles east and southwest of the project site.
Campanula exigua Chaparral harebell	–/–/1B.2	San Francisco Bay region, northern inner south Coast Range: Alameda, Contra Costa, San Benito, Santa Clara, and Stanislaus Counties	Rocky areas in chaparral, usually on serpentine	May–June	Low—no serpentine present in project site; species is known from two locations 2.7 miles south of the project site.
Caulanthus lemmonii Lemmon's jewel-flower	–/–/1B.2	Southeast San Francisco Bay Area, south through the South Coast Ranges and adjacent San Joaquin Valley to Ventura County	Dry, exposed slopes in grasslands and pinyon-juniper woodland	March–May	Moderate to High—suitable annual grassland habitat within project site; species is known to occur 0.7 mile southeast and 1.4 miles south of the project site.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	–/–/1B.2	Eastern San Francisco Bay Area, Salinas Valley, and Los Osos Valley	Lower slopes, flats, and swales in annual grasslands; locally on alkaline or saline soils	June–November	Moderate to High—suitable annual grassland habitat and alkaline soils are present in the project site; species is known to occur along Altamont Pass Road 3.7 miles west of the project site.
Deinandra bacigalupii Livermore tarplant	–/E/1B.1	Endemic to Alameda County (Livermore Valley)	Alkaline meadows and seeps	June–October	Moderate—moist alkali soils are present in the project site; species is known to occur 4.5 and 4.9 miles west of the project site.

Species	Status[a] Federal/ State/CRPR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Site[b]
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	–/–/1B.2	Inner South Coast Ranges, eastern San Francisco Bay: Alameda, Contra Costa, Merced, San Benito, Santa Clara, San Joaquin, San Luis Obispo, and Stanislaus Counties	Openings in chaparral, mesic cismontane woodland, on moist slopes and ravines	April–June	Moderate to High—suitable habitat may occur in riparian wetland habitat in project site; species is known from 2 locations within 2.4 to 5 miles south and southwest of the project site.
Eschscholzia rhombipetala Diamond-petaled poppy	–/–/1B.1	Interior foothills of south Coast Ranges from Contra Costa County to Stanislaus County, Carrizo Plain in San Luis Obispo County	Grassland, chenopod scrub, on clay soils, where grass cover is sparse enough to allow growth of low annuals	March–April	Moderate to High—suitable annual grassland habitat within project site; species is known from 2 locations within 0.5 to 1.7 miles south of the project site.
Extriplex joaquiniana San Joaquin spearscale (saltbush)	–/–/1B.2	West margin of Central Valley from Glenn to Tulare Counties	Alkali grasslands, alkali scrublands, alkali meadows, saltbush scrublands	April–September	Moderate to High—suitable annual grassland and alkali habitats are present throughout the project site; species is known from seven locations approximately 2–3 miles north to west of the project site.
Hesperolinon breweri Brewer's western flax	–/–/1B.2	Southern north inner Coast Range, northeast San Francisco Bay region, especially Mt. Diablo: Contra Costa, Napa, and Solano Counties	Chaparral, cismontane woodland, valley and foothill grassland, usually on soils derived from serpentinite	May–July	Low—no serpentinite-derived soils are present; species is known from 1 location approximately 2.1 miles south of the project site.
Madia radiata Showy golden madia	–/–/1B.1	Scattered populations in the interior foothills of the South Coast Ranges: Contra Costa,[c] Fresno, Kings,[c] Kern, Monterey,[c] Santa Barbara,[c] San Benito, Santa Clara, San Joaquin,[c] San Luis Obispo, and Stanislaus Counties	Oak woodland, valley and foothill grassland, slopes	March–May	Moderate—suitable annual grassland habitat within project site; species is known to occur 4.5 miles southeast of the project site.

Species	Status[a] Federal/ State/CRPR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Site[b]
Navarettia nigelliformis ssp. *radians* Shining navarretia	–/–/1B.2	Interior foothills of South Coast Ranges from Merced County to San Luis Obispo County	Mesic areas with heavy clay soils, in swales and clay flats, in oak woodland, grassland	April–July	High—suitable swales in the project site; species is known to occur at eastern edge of the project site.
Puccinellia simplex California alkali grass	–/–/1B.2	Central valley and interior coast ranges, from Mendocino County to San Bernardino County	Alkaline, vernally mesic; sinks, flats, and lake margins; chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools	March–May	Moderate to High—suitable alkaline soils in the project site; species is known to occur within 2.5 miles northwest of the project site.
Senecio aphanactis Rayless ragwort	–/–/2B.2	Scattered locations in central western and southwestern California, from Alameda County to San Diego County	Oak woodland, coastal scrub, chaparral, open sandy or rocky areas, on alkaline soils	January–April	Low—suitable scrub habitat is isolated and of very limited distribution in the project site; species is known from two locations 1.7 miles southwest of the project site.
Spergularia macrotheca var. *longistyla* Long-styled sand spurrey	–/–/1B.2	Alameda, Contra Costa, Napa, and Solano Counties	Meadows and seeps, alkaline marshes and swamps	February–May	Moderate to High—suitable alkaline soils in the project site; species is known from two locations within 1.7 to 2.6 miles northeast/northwest of the project site.
Tropidocarpum capparideum Caper-fruited tropidocarpum	–/–/1B.1	Historically known from the northwest San Joaquin Valley and adjacent Coast Range foothills	Grasslands in alkaline hills	March–April	Moderate—suitable grassland and alkaline soils in the project site; species was historically known to occur along Grant Line Road 1.3 miles north of the project site and within 0.7 mile west of the project site.

Sources: California Department of Fish and Wildlife 2020b; California Native Plant Society 2020.

[a] Status explanations:

Federal

E = listed as endangered under the ESA

– = no listing.

State

E = listed as endangered under the CESA

– = no listing.

California Rare Plant Rank (CRPR)

1A = List 1A species: presumed extinct in California.

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.

2B = List 2B species: rare, threatened, or endangered in California but more common elsewhere.

CRPR Code Extensions

0.1 = seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat

0.2 = fairly endangered in California (20–80% of occurrences threatened)

[b] Occurrence probability definitions:

High =Known occurrences of the species within the project site, or CNDDB, or other documents, record the occurrence of the species within a 5-mile radius of the project site and suitable habitat is present within the project site;

Moderate = CNDDB, or other documents, record the known occurrence of the species within a 5-mile radius of the project site and lower quality or limited habitat is present within the project site;

Low = CNDDB, or other documents, do not record the occurrence of the species within a 5-mile radius of the project site and poor-quality suitable habitat is present within the project site.

[c] Populations uncertain or extirpated in the county.

Table 3.4-3. Special-Status Wildlife Species Known to Occur or with Potential to Occur in or within 5 Miles of the Mulqueeney Ranch Repowering Project Site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Invertebrates				
Branchinecta longiantenna Longhorn fairy shrimp	E/–/–	Eastern margin of central Coast Ranges from Contra Costa County to San Luis Obispo County; disjunct population in Madera County	Small, clear pools in sandstone rock outcrops of clear to moderately turbid clay- or grass-bottomed pools	Low—outside of species known range; CNDDB occurrences within 5 miles west and southwest of project site. Rock outcrops within the project site do not show evidence of pools and the species is not known to occur in grassland pools in this portion of the species range
Branchinecta lynchi Vernal pool fairy shrimp	T/–/–	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	Moderate—two vernal pools, several alkali wetlands, and small ephemeral ponds in the project site provide suitable habitat
Lepidurus packardi Vernal pool tadpole shrimp	T/–/–	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	Moderate—two vernal pools, several alkali wetlands, and small ephemeral ponds in the project site provide suitable habitat
Desmocerus californicus Valley elderberry longhorn beetle	T/–/–	Streamside habitats below 3,000 feet above sea level throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs and streamside habitats below 3,000 feet above sea level. Elderberry shrub is the host plant.	High—Numerous (more than 30) elderberry host plants are present in the project site; closest CNDDB record is 5 miles southeast from the project site
Hygrotus curvipes Curved-foot hygrotus diving beetle	–/–/–	Western side of the San Joaquin Valley from Oakley in Contra Costa County south to Alameda County	Aquatic; small seasonal pools and wetlands and small pools left in dry creek beds, associated with alkaline-tolerant vegetation	Moderate—suitable habitat in project site; eight CNDDB records located 4 to 5 miles north from the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Callophrys mossii bayensis San Bruno elfin butterfly	–/CE/–	Coastal mountains near San Francisco Bay; all known locations are restricted to San Mateo County	North-facing slopes and ridges facing Pacific Ocean from 600 to 1,100 feet; rocky outcrops and cliffs in coastal scrub	None—project site is outside of species known range
Bombus occidentalis Western bumble bee		Historically occurred throughout much of northern California but currently appears to be absent from much of this area. Current known locations are high-elevation sites in northern California and a few sites on the northern California coast	Nests underground in squirrel burrows, in mouse nests, and in open west-southwest facing slopes bordered by trees. Visits a wide variety of wildflowers. Plant genera it is most commonly associated with are Cirsium, Erigonum, Solidago, "Aster," Ceonothus, Centaurea, and Penstemon	Moderate—suitable habitat is present within grasslands throughout the project site; one historic CNDDB record from between 1946 and 1951 located 2 miles south of the project site
Danaus plexippus Monarch Butterfly	FC/–/–	Winters and breeds throughout California; hundreds of historic overwintering sites are located along the coast from Mendocino County south to Baja California; breeds throughout lowlands of California where milkweed (*Asclepias* sp.) plants are present.	Overwinters within eucalyptus, Monterey pine, sycamore, and oak groves; forages on nectar-producing plants during migration and requires milkweed plants as a larval hostplant during breeding	Moderate—suitable breeding habitat (milkweed plants) is scattered throughout the project site; however, there are no concentrated populations of the host plant; foraging habitat (nectar producing plants) are present throughout the project site
Fish				
Hypomesus transpacificus Delta smelt	T/E/–	Primarily in the Sacramento–San Joaquin Estuary, but has been found as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River; range extends downstream to San Pablo Bay	Occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand (Moyle 2002)	None—No suitable habitat (estuary) in the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Amphibians				
Ambystoma californiense California tiger salamander	T/T/–	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Sonoma County south to Santa Barbara County	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	High—Species has been previously detected on the project site and numerous CNDDB records exist within 1.24 miles of the project site Ponds on the project site represent suitable breeding habitat and grasslands provide upland habitat
Rana boylii Foothill yellow-legged Frog (west/central coast clade)	–/E/–	Central coast and west side of San Joaquin Valley from Santa Clara County south through Kern County	Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. Usually found near riffles with rocks and sunny banks nearby	None—no suitable streams with rocky, gravel substrate and overhanging vegetation are present within the project site
Rana draytonii California red-legged frog	T/SSC/–	Found along the coast and coastal mountain ranges of California from Mendocino County to San Diego County and in the Sierra Nevada from Butte County to Stanislaus County	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation; may estivate in rodent burrows or cracks during dry periods	High—project site is entirely within designated critical habitat for the species. The species was detected in the project site during 2019 field surveys and three previous CNDDB records from the project site. Ponds throughout the project site represent suitable aquatic habitat and grasslands provide upland dispersal habitat
Spea hammondii Western spadefoot toad	–/SSC/–	Sierra Nevada foothills, Central Valley, and Coast Ranges	Seasonal wetlands such as vernal pools and stock ponds in annual grasslands and oak woodlands	High—Ephemeral ponds throughout the project site represent suitable breeding habitat and grasslands provide upland nesting habitat; several CNDDB records exist within 5 miles of the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Reptiles				
Actinemys marmorata Western pond turtle	–/SSC/–	Uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests. Nests are typically constructed in upland habitat within 0.25 mile of aquatic habitat.	High—Ponds throughout the project site represent suitable breeding habitat and grasslands provide upland habitat; there are eight CNDDB records located within 5 miles of the project site
Anniella pulchra Northern California legless lizard	–/SSC/–	Along the Coast, Transverse, and Peninsular Ranges from Contra Costa County to San Diego County with spotty occurrences in the San Joaquin Valley; elevation range extends from sea level to 5,100 ft.	Occurs in moist warm loose soil with plant cover. Moisture is essential. Habitat consist of sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces.	Low—limited suitable habitat in the project site along Patterson Creek; three CNDDB records within 2 miles of the project site in the vicinity of seasonal streams
Arizona elegans occidentalis California glossy snake	–/SSC/–	Occurs from the eastern part of the San Francisco Bay Area south to northwestern Baja California; absent along the central coast. There are also old reports of this snake from the Santa Monica Mountains.	Occurs in arid scrub, grassland, and chaparral habitats, and rocky washes	High—suitable grassland and scrub habitat is present within the project site; two CNDDB records in the project site and 10 additional records within 5 miles of the project site
Masticophis flagellum ruddocki San Joaquin coachwhip	–/SSC/–	From Colusa county in the Sacramento Valley southward to the grapevine in the San Joaquin Valley and westward into the inner coast ranges. An isolated population occurs at Sutter Buttes. Known elevational range from 66–2,953 ft.	Occurs in open, dry, vegetative associations with little or no tree cover; in valley grassland and saltbush scrub associations; and often occurs in association with mammal burrows	High—suitable grassland habitat is present within the project site; four CNDDB records for occurrences within 5 miles of the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Masticophis lateralis euryxanthus Alameda whipsnake	T/T/–	Restricted to Alameda and Contra Costa Counties; fragmented into five disjunct populations throughout its range	Valleys, foothills, and low mountains associated with northern coastal scrub or chaparral habitat; requires rock outcrops for cover and foraging	Low—limited suitable scrub/shrub habitat in the project site; grassland and rock outcrop habitat with abundant rodent burrows within the project site represents suitable dispersal and foraging habitat; there are seven CNDDB records located 0.75 mile to 2 miles south of the project site; southern portion of the project site is within critical habitat
Phrynosoma blainvillii Blainville's (Coast) horned lizard	–/SSC/–	Sacramento Valley, including foothills, south to southern California; Coast Ranges south of Sonoma County; below 1,200 meters (4,000 feet) in northern California	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging	High—annual grassland and scrub areas in the project site represent suitable habitat where loose soils are present; one CNDDB record 700 feet from the project site and 11 additional CNDDB records within 5 miles of the project site
Thamnophis gigas Giant garter snake	T/T/–	Central Valley from the vicinity of Burrel in Fresno County to near Chico in Butte County; extirpated from areas south of Fresno	Sloughs, canals, low-gradient streams, and freshwater marshes where there is a prey base of small fish and amphibians. Also irrigation ditches and rice fields. Requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	None—no suitable habitat is present in the project site and no CNDDB records within 5 miles

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Birds				
Haliaeetus leucocephalus Bald eagle	D/E, FP/BGEPA	Bald eagles may be found throughout most of California at lakes, reservoirs, rivers, and some rangelands and coastal wetlands. The state's breeding habitats are mainly in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers.	In western North America, nests and roosts in tall trees within 1 mile of a lake, reservoir, or stream, or the ocean	~~Low—one eagle observed~~High—a total of 8 bald eagles were detected during project field surveys~~;~~ in 2019/2020; while bald eagles may fly through the project site during daily movements, no suitable nesting or foraging habitat (large lakes, reservoirs, or rivers) ~~in~~is present on or near the project site; no CNDDB records for nesting within 5 miles of project site
Gymnogyps californianus California condor	E/E,FP/–	Became extinct in the wild in 1987 but reintroduced through captive breeding program. Current range in California includes the coastal mountains and southern Sierra Nevada mountains of central and southern California.	Occurs in rocky shrubland, coniferous forest, and oak savanna. Often found near cliffs or large trees. Very large range home ranges, with extensive flights during the day. Primarily forages on carcasses of large animals such as deer, goats, sheep, cattle, or other large mammals.	Low—one individual observed flying over during project field surveys; no suitable nesting habitat is present. Species could thus occasionally forage in the project area, but incidences are expected to be extremely rare due to low population size and distance to the nearest known nesting area (more than 80 miles).
Aquila chrysaetos Golden eagle	– /FP/BGEPA	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as the Central Valley	Nests in cliffs and escarpments or tall trees; forages in annual grasslands, chaparral, or oak woodlands that provide abundant mammals (ground squirrels and larger) for prey	High—several observed during project field surveys; suitable foraging habitat is present but nesting habitat is limited to large rock outcrops, scattered trees and electrical transmission towers; species could also nest on the ground or within small trees; closest CNDDB record for nesting is 2.3 miles south of project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Buteo swainsoni Swainson's hawk	–/T/–	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	High—species observed frequently during project field surveys; suitable foraging habitat is present but nesting habitat is limited to scattered trees and electrical transmission towers; six CNDDB records for nest locations 4 to 5 miles northeast of the project site
Circus cyaneus Northern harrier	–/SSC/–	Breeds and winters throughout much of the state occurring between sea level near the coast and up to 9000 feet in Mono County	Occurs in grasslands, meadows, marshes, and seasonal and agricultural wetlands throughout lowland California	High—species observed during project field surveys; suitable nesting and foraging habitat is present in the project site
Elanus leucurus White-tailed kite	–/FP/–	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	High—species observed during project field surveys; suitable foraging habitat is present but nesting habitat is limited to scattered trees and electrical transmission towers; three CNDDB records for nests within 5 miles of the project site; closest record is 0.65 mile from the project site
Athene cunicularia Burrowing owl	–/SSC/–	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows	High—species observed at several locations throughout the project site during project surveys; suitable nesting, wintering, and foraging habitat present; seven CNDDB records for occurrences in the project site and numerous additional records within 5 miles of the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Asio flammeus Short-eared owl	–/SSC/–	Klamath Basin, Modoc Plateau, and Great Basin in northeastern California; Sacramento Valley and Sierra foothills; Suisun Marsh and the Sacramento–San Joaquin Delta; the San Joaquin Valley and adjacent Coast Range valleys south of Merced County; Mojave Desert; and limited locations along the central and southern coast	Requires open lands with abundant rodents (particularly voles) and areas of tall and dense herbaceous cover to conceal nests; habitats include saline and freshwater marshes, ungrazed grasslands, old pastures, and irrigated alfalfa or grain fields	High—suitable nesting and foraging habitat in the project site; one CNDDB record from 1995 for a nest site 500 feet from the project site
Asio otus Long-eared owl	–/SSC/–	Throughout California, except for entire floor of the Central Valley and locally on the southern coast.	Requires dense, riparian, conifer or woodlands for nesting, often near edges of wet meadows; forages in open grasslands, woodlands, and meadows.	Moderate—densely wooded areas suitable for nesting are not present on the project site; grasslands on the project site provide potential foraging habitat if nesting nearby or migrating through the project site; species has only recently been found during avian fatality surveys in the APWRA.
Lanius ludovicianus Loggerhead shrike	–/SSC/–	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches; nests in densely foliaged trees or shrubs	High—species observed during project field surveys; suitable foraging habitat is present throughout the project site; nesting habitat is limited to shrubs and trees scattered throughout the project site; nine CNDDB records within 5 miles of the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Agelaius tricolor Tricolored blackbird	–/T/–	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony	High—species was observed foraging in a small flock during the October 2019 field surveys; larger areas of freshwater marsh in the project site provide suitable nesting habitat; foraging habitat present throughout the project site; there are nine CNDDB records for nesting locations within 5 miles of the project site
Grus canadensis tabida Greater sandhill crane	–/T, FP/–	Breeds in Siskiyou, Modoc, Lassen, Plumas, and Sierra Counties. Winters in the Central Valley, southern Imperial County, Lake Havasu National Wildlife Refuge, and the Colorado River Indian Reserve	Summers in open terrain near shallow lakes or freshwater marshes. Winters in plains and valleys near bodies of fresh water	~~None~~Low —species does not breed in Alameda County and no suitable winter foraging habitat is present on the project site. One sandhill crane was observed flying over the project site at a high altitude in May 2020. Species is a potential migrant through the airspace above the project site~~.~~ (more than 200 meters).
Icteria virens Yellow-breasted chat	–/SSC/–	Breeds throughout much of California except high elevation mountain regions	Nests in multi-layered riparian scrub or willow woodland corridors along flowing streams	Moderate—limited nesting habitat (riparian woodlands) is present on the project site and throughout the APWRA; species could migrate through the project site and is infrequently found during avian fatality surveys in the APWRA
Dendroica petechia brewsteri Yellow warbler	–/SSC/–	Breeding range from coastal Del Norte County, east to Modoc plateau and Inyo County, south to coastal Santa Barbara and Ventura County, west to Kern County; winters in Imperial and Colorado river valleys. Found up to 8,000 feet in Sierra Nevada	In California, commonly breeds in riparian woodlands and forests and montane conifer forests with a heavy brush understory near waterbodies	Moderate—limited nesting habitat (riparian woodlands) is present on the project site and throughout the APWRA; species could migrate through the project site and is infrequently found during avian fatality surveys in the APWRA

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Chaetura vauxi Vaux's swift	–/SSC/–	In California, breeding range includes the redwood-forested coastal zone from the Oregon border south to Santa Cruz County and mid-elevation Sierra Nevada at much lower densities; uncommon in inland valleys from Santa Clara County north to Sonoma County where it typically nests in chimneys	Prefers redwood and Douglas fir forests constructing their nests in tree hollows and snags	Moderate—suitable nesting habitat is not present; potential infrequent migrant through the project site; suitable foraging habitat present at waterbodies throughout the project site; species is infrequently found during avian fatality surveys in the APWRA
Vireo bellii pusillus Least Bell's vireo	E/E/–	Small populations remain in southern Inyo, southern San Bernardino, Riverside, San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties. Found at the San Joaquin River National Wildlife Refuge (San Joaquin and Stanislaus Counties) in 2005	Riparian thickets/dense willows with a well-developed understory either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons	Low—outside of species current known range; limited suitable nesting habitat along Patterson Creek; one historic (1932) CNDDB record for an occurrence approximately 4 miles from the project site
Ammodramus savannarum Grasshopper sparrow	–/SSC/–	Central Valley and foothills, west slope of Sierra Nevada, Coast Ranges, and coastal areas from Del Norte County south to San Diego County; rare breeder in the Shasta Valley area of Siskiyou County	Occurs in short to medium height dry grasslands with scattered shrubs in the Central Valley, Sierra foothills, and south coast; found in prairies and pastures scattered in largely forested areas along north coast; nests on ground in grass or at base of shrub	High—suitable nesting and foraging habitat in the project site; one CNDDB record within 5 miles of the project site

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Mammals				
Antrozous pallidus Pallid bat	–/SSC/–	Low elevations throughout California	Occurs in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California. Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Uses caves, crevices, mines, and hollow trees for roosting.	High—may roost in rock outcrops with larger crevices in the project site; may forage or drink in the project site; there is one CNDDB record approximately 4.5 miles from the project site; documented during fatality surveys at other wind facilities in the APWRA
Corynorhinus townsendii Townsend's big-eared bat	–/SSC/ WBWG High	Widespread throughout California	Roosts in caves, tunnels, mines, crevices, hollow trees, and buildings; usually near water	~~Low~~Moderate—may forage in the project site but limited roosting habitat (buildings) is present; one CNDDB record within 5 miles of the project site
Myotis lucifugus Little brown bat	–/–/ WBWG Medium	Found throughout the northern portion of California, primarily at higher elevations	Often associated with coniferous forest; requires nearby water; roosts in hollow trees, rock outcrops, buildings, and occasionally mines and caves	High—may roost in rock outcrops in the project site; may forage or drink in the project site; documented during fatality surveys at other wind facilities in the APWRA
Lasiurus blossevillii Western red bat	–/SSC/ WBWG High	Found from Shasta County south to the Mexican border and west of the Sierra/Cascade crest and deserts; the winter range includes western lowlands and coastal regions south of San Francisco Bay	Found primarily in riparian and wooded habitats; occurs at least seasonally in urban areas; day roosts within foliage of trees; found in fruit orchards and sycamore riparian habitats in the Central Valley	High—may roost in riparian habitat and other groups of trees in the project site; may forage or drink in the project site; documented during fatality surveys at other wind facilities in the APWRA

Scientific Name Common Name	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Likelihood to Occur on the Project Site[b]
Lasiurus cinereus Hoary bat	–/–/WBWG Medium	Occurs throughout California from sea level to 13,200 feet; winters in southern California	Primarily roosts in forested habitats; also found in riparian areas and in park and garden settings in urban areas; day roosts within foliage of trees	High—may roost in riparian habitat and other groups of trees in the project site; may forage or drink in the project site; documented during fatality surveys at other wind facilities in the APWRA
Taxidea taxus American badger	–/SSC/–	In California, badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties	Badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub with abundant rodent populations (prey)	High—suitable habitat is present throughout the project site; three CNDDB records within the project site and 14 additional occurrences within 5 miles of the project site
Vulpes macrotis mutica San Joaquin kit fox	E/T/–	Principally occurs in the San Joaquin Valley and adjacent open foothills to the west; recent records from 17 counties extending from Kern County north to Contra Costa County	Saltbush scrub, grassland, oak, savanna, and freshwater scrub	Low to Moderate—suitable habitat is present throughout the project site; one CNDDB record in the project site and 17 additional occurrences within 5 miles of the project site~~;~~ (all ~~prior~~ records are more than 20 years old~~;~~); there is a potential for incidental use of the project site by foxes dispersing from the central San Joaquin Valley

[a] Status explanations:

Federal

E = listed as endangered under the ESA; T = listed as threatened under the ESA; PT = proposed for federal listing as threatened under the ESA; C = species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded; D = delisted; – = no listing.

State

E = listed as endangered under CESA; T = listed as threatened under CESA; C = Candidate for listing under CESA; FP = fully protected under the California Fish and Game Code; SSC = species of special concern in California; D = delisted; FP = fully protected species under CFGC; – = no listing.

Other - Western Bat Working Group (WBWG) Priority

High = Species are imperiled or at high risk of imperilment; Medium = Indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats. A lack of meaningful information is a major obstacle in adequately assessing these species' status and should be considered a threat.

[b] Likelihood of occurrence in the project site:

High = Known occurrences of the species foraging or breeding within the project site~~, or~~ or species has been previously documented (i.e., CNDDB, published reports, or other documents~~, records the occurrence of the species~~) , within a 5-mile radius of the project site and suitable habitat is present within the project site; **Moderate** = ~~CNDDB~~Species has been previously documented (i.e., CNDDB, published reports, or other documents~~, records the known occurrence of the species~~) within a 5-mile radius of the project site and lower quality or limited habitat is present or ~~no known~~ species has not previously documented occurrences within ~~5 miles~~ a 5-mile radius of the project site but higher quality suitable habitat is present within the project site; **Low** = Project site is within the known migratory or breeding range of the species but there are extremely infrequent observations (as in the case of birds flying over but not known to nest or roost,) or lack of any previously documented occurrences (i.e., CNDDB, published reports, or other documents~~, does not record the occurrence~~) of the species within a 5-mile radius of the project site, and poor quality suitable habitat is present within the project site; **None** = species range does not overlap with the project site or no suitable habitat.

New Information Obtained since Certification of the PEIR

Terrestrial Species References

The following sources of information were not available at the time the PEIR was prepared. These sources include recent data for special-status plants and wildlife occurrences within and near the project sites and site-specific evaluations conducted to support the project.

- CNDDB for the Midway and surrounding USGS 7.5-minute quadrangles (California Department of Fish and Wildlife 2020b).
- CNPS's Inventory of Rare and Endangered Plants for the Midway and surrounding USGS 7.5-minute quadrangles (California Native Plant Society 2020).
- The Information for Planning and Consultation Trust Resource Report species list for the project site (U.S. Fish and Wildlife Service 2020a).
- *Biological Resources Evaluation for the Mulqueeney Ranch Wind Repowering Project* (ICF 2020a) (included as Appendix C to this SEIR).
- *Mulqueeney Ranch Wind Repowering Project, Aquatic Resources Delineation Report* (ICF 2019a).
- *Mulqueeney Ranch Wind Repowering Project—Site Assessment for California Tiger Salamander and California Red-legged Frog* (ICF 2019b).
- *Avian Survey Report for the Mulqueeney Ranch Wind Repowering Project* (ICF 2020b) (included as Appendix D to this SEIR).

Avian and Bat Studies and References

The following sources of information ~~were not available at the time the PEIR was prepared and~~ are used to support the analyses of operational and cumulative impacts on birds and bats. Sources cited here that were published prior to <u>certification of</u> the PEIR ~~were used for two purposes. First, there is information that supports~~ <u>support</u> the current analysis, but ~~that was~~ <u>were</u> not cited in the PEIR itself. ~~Second, the discussion of micro-siting in Chapter 4, *Alternatives Analysis*, includes a list of all micro-siting studies performed in the APWRA, and those studies are included in the following list.~~

- New and revised fatality monitoring reports for old-generation and repowered projects:
  - *Vasco Avian and Bat Monitoring Project 2012–2013 Annual Report* (Brown et al. 2013).
  - *Vasco Avian and Bat Monitoring Project 2012–2015 Final Report* (Brown et al. 2016).
  - *Final Report Altamont Pass Wind Resource Area Bird Fatality Study. Monitoring Years 2005–2013* (ICF 2016).
  - *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Report: Year 1* (H. T. Harvey & Associates 2018a).
  - *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Report: Year 2* (H. T. Harvey & Associates 2018b).
  - *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Project: Final 3-Year Report* (Draft) (H. T. Harvey & Associates 2020).

- *Golden Hills North Wind Energy Center Postconstruction Fatality Monitoring Report: Year 1* (Draft) (Great Basin Bird Observatory and H. T. ~~Harvey & Associates 2020~~ Harvey & Associates 2020a).
- *Golden Hills North Wind Energy Center Postconstruction Fatality Monitoring Report: Years 1 and 2* (Draft) (Great Basin Bird Observatory and H. T. Harvey & Associates 2020b).

- New studies of golden eagles in and near the APWRA:
  - *Estimation of occupancy, breeding success, and predicted abundance of Golden Eagles (*Aquila chrysaetos*) in the Diablo Range, California, 2014* (Wiens et al. 2015).
  - *Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update* (U.S. Fish and Wildlife Service 2016).
  - *GPS Satellite Tracking of Golden Eagles (*Aquila chrysaetos*) in the Altamont Pass Wind Resource Area (APWRA) and the Diablo Range: Final Report for Phases 1 and 2 of the NextEra Energy Settlement Agreement* (Bell 2017).
  - *Spatial Demographic Models to Inform Conservation Planning of Golden Eagles in Renewable Energy Landscapes* (Wiens et al. 2017).
  - *Distribution, nesting activities, and age-class of territorial pairs of golden eagles at the Altamont Pass Wind Resource Area, California, 2014–2016* (Kolar and Wiens 2017).
  - *Addendum to Comparison of Wind Turbine Collision Hazard Model Performance: One-year Post-construction Assessment of Golden Eagle Fatalities at Golden Hills* (Smallwood 2018).
  - *Golden Eagle Population Monitoring in the Vicinity of the Altamont Pass Wind Resource Area, California, 2014–2018* (Wiens and Kolar 2019).
  - *Distribution and Abundance of Aquila chrysaetos (Golden Eagles) in the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan Area, California* (Wiens et al. 2020).
- Turbine micro-siting studies:
  - *Siting Wind Turbines to Minimize Raptor Collisions at Tres Vaqueros Repowering Project* (Smallwood and Neher 2010).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Tres Vaqueros Repowering Project* (Smallwood and Neher 2011).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Sand Hill Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2016b).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Summit Winds Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2016c).
  - *Siting Wind Turbines to Minimize Raptor Collisions at Sand Hill Repowering Project, Altamont Pass Wind Resource Area* (Smallwood and Neher 2018).
  - *Assessment of Proposed Wind Turbine Sites to Minimize Raptor Collisions at the Sand Hill Wind Repowering Project in the Altamont Pass Wind Resource Area* (Estep 2019).
- Other reviews of wind power impacts on birds and bats, in the APWRA and elsewhere:

- *Map-based repowering of the Altamont Pass Wind Resource Area based on burrowing owl burrows, raptor flights, and collisions with wind turbines* (Smallwood and Neher 2009).
- *Comparing Bird and Bat Use Data for Siting New Wind Power Generation* (Smallwood and Neher 2016a).
- *Bird and Bat Impacts and Behaviors at Old Wind Turbines at Forebay, Altamont Pass Wind Resource Area* (Smallwood and Neher 2016d).
- *Comparison of Wind Turbine Collision Hazard Model Performance Prepared for Repowering Projects in the Altamont Pass Wind Resource Area* (Smallwood and Neher 2017).
- *Impacts to Wildlife of Wind Energy Siting and Operation in the United States* (Allison et al. 2019)
- *Evidence of Region-Wide Bat Population Decline from Long-Term Monitoring and Bayesian Occupancy Models with Empirically Informed Priors* (Rodhouse et al. 2019).
- *Relating Bat and Bird Passage Rates to Wind Turbine Collision Fatalities* (Smallwood and Bell 2019).
- *Skilled Dog Detections of Bat and Small Bird Carcasses in Wind Turbine Fatality Monitoring* (Smallwood et al. 2019).

Avian Studies

Field Studies

Between June 2019 and June 2020, the project applicant performed surveys and evaluations of the project site use by birds. These included avian use surveys, raptor nesting and perching surveys, and tricolored blackbird surveys, all reported in the *Avian Survey Report for the Mulqueeney Ranch Wind Repowering Project* (ICF 2020b), also included as Appendix D to this SEIR.

Avian use surveys were conducted on eight 200-meter-radius fixed plots within the project site, and were performed consistent with guidelines recommended in Tier 3 of USFWS's Land-Based Wind Energy Guidelines (U.S. Fish and Wildlife Service 2012a). Four locations were in upland grassland, and the other four were along riparian habitat adjoining the Patterson Pass Road. Surveys were performed monthly and recorded a total of 2,812 individuals and 56 different species. Observations were overwhelmingly dominated by common passerines (songbirds); the five most common species, accounting for 59% of observations, were western bluebird, common raven, house finch, European starling, and red-winged blackbird. The most common raptors were the golden eagle and red-tailed hawk (62 observations), but American kestrels, bald eagles, ferruginous hawks, peregrine falcons, prairie falcons, turkey vultures, a merlin, and a Swainson's hawk were also detected, for a total of 108 raptor observations. Raptor nest surveys identified 4 active raptor nests and 12 unoccupied raptor stick nests located within or within 1,000 feet from the project area. Nests were located in trees and in transmission towers. The project area includes riparian trees and electrical transmission line towers, both of which provide perching opportunities for raptors and other birds.

Birds were twice as common in the winter and spring (67% of observations), compared to the summer and fall (33% of observations). When compared to past avian use surveys performed throughout the APWRA between 2005 and 2013 (ICF 2016), relatively low detection rates were found for the Mulqueeney site; for instance, American kestrel and red-tailed hawk were both encountered less than 1/5 as frequently as in surveys elsewhere in the APWRA.

Fatality Monitoring Results

The PEIR (Alameda County Community Development Agency 2014) considered fatality monitoring results from three projects: Diablo Winds, Buena Vista, and Vasco Wind. Since the PEIR was prepared in 2014, an additional 2 years of monitoring for birds and bats at Vasco Wind were completed. The results were reported in Brown et al. (2016) and are incorporated into this analysis. Additionally, the Golden Hills project was constructed and 3 years of avian and bat monitoring have been completed, and 1 year of monitoring has been completed for the Golden Hills North project.

Golden Hills monitoring results are presented by H. T. Harvey & Associates (2020) in the *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Project: Final 3-Year Report* (Draft). The monitoring effort indicated higher ~~mortality~~ fatality rates than those estimated in the PEIR, particularly for small birds (less than 100 grams, about the size of a mourning dove [*Zenaida macroura*]) and red-tailed hawks (*Buteo jamaicensis*). The Golden Hills data (H. T. Harvey & Associates 2020) are especially noteworthy for the use of search dogs (*Canis familiaris*) and, to a limited extent[1], 7-day search intervals rather than the 28-day search intervals that were used for most of the baseline and repower ~~mortality~~ fatality estimates presented in the PEIR. The use of different search methods make comparison with the PEIR's baseline data difficult (H. T. Harvey & Associates 2018a:51); in particular, detection rates for small birds are much higher with the use of dogs and 7-day search intervals than with the use of unaided human searchers and 28-day search intervals (H.T. Harvey and Associates 2020:v). Similar detection methods were also used at Golden Hills North and Vasco Winds, with similarly high detection rates for small birds; thus ~~mortality~~ fatality rate estimations for the proposed project are based upon the detection rates observed at these three projects, disregarding the older data for the Buena Vista and Diablo Winds projects.

The Golden Hills estimated ~~mortality~~ fatality rate (averaged over the 3 years of monitoring) for all raptors combined (the primary criterion for APWRA avian impact measurement) was significantly lower than the pre-repowering average from the APWRA-wide avian monitoring study (which already reflected significant ~~mortality~~ fatality reductions resulting from seasonal shutdown and the removal of high-risk turbines in accordance with the 2007 settlement agreement) (H. T. Harvey & Associates 2020). APWRA-wide non-repowered average ~~mortality~~ fatality rates for all raptors combined was 2.43 per MW per year. The all-raptors combined average ~~mortality~~ fatality rate for Golden Hills in its first 3 years of operation was 1.15/MW/year, 53% less than the average pre-repowered APWRA-wide rate—even though the latter included seasonal shutdowns and high-risk turbine removals.

The first year ~~of~~ avian fatality monitoring ~~is now available~~ report for the Golden Hills North project was available in draft form for consideration in the draft SEIR, and the second year report became available at the close of the extended public comment period (Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a and 2020b, respectively). This monitoring, like Golden Hills, entailed a subset of 7-day search intervals as well as the use of trained dogs for carcass detection, both of which resulted in high detection rates for small birds. ~~The~~ In the first year of monitoring the small bird fatality rate was 9.44/MW/ year, the highest yet recorded at any project in the APWRA, and 72% higher than the average of the Golden Hills, Golden Hills North, and Vasco Winds projects. This result suggests high project-to-project variability in turbine risks to small birds, likely reflecting

[1] Surveys were performed for all turbines at 28-day intervals, and 7-day surveys were additionally performed at a randomized subset of 16 turbines; a different group of 16 turbines was selected in each of the three monitoring years.

variability in habitat. Conversely, Golden Hills North has unusually low rates of raptor fatalities, with an “all raptors” rate of 0.59 fatalities/MW/year, which is 33% lower than the average rate for all five repowered projects now operating in the APWRA, and 76% lower than the baseline non-repowered rate. This is largely due to an unusually low fatality rate for red-tailed hawks. The second year report indicates that bat fatalities in the two years were not significantly different from each other and levels of bird fatalities “did not differ” compared to the first-year results. As the second year report has not been fully reviewed and recommended by the County’s TAC at the time of this analysis, the report’s results are not explicitly considered in this analysis.

Golden Eagle Studies

Behavioral Studies

Since preparation of the PEIR (Alameda County Community Development Agency 2014), USFWS proposed and finalized a rule revising the regulations for permits for incidental take of eagles and eagle nests. In support of that process, USFWS prepared a report summarizing the status, trends, and sustainable take rates in the United States for bald and golden eagles (U.S. Fish and Wildlife Service 2016). In Bird Conservation Region (BCR) 32, a region covering most of California and that includes the APWRA, the median golden eagle population was estimated to be 718 individuals, a reduction from previous estimates (U.S. Fish and Wildlife Service 2016). However, prior studies of golden eagles in and near the APWRA have not addressed BCR 32, but instead have focused on the Diablo Range. The rationale for this is explained by Wiens et al. (2015~~)~~), who note that “[t]racking data indicated that many individuals captured near the [APWRA] remained year-round residents of the broader region of the Diablo Range” and that “the high density of breeding golden eagles observed near APWRA by Hunt and Hunt (2006, 2013) extends into much of the broader surrounding region of the Diablo Range.” Wiens et al. (2015) estimate the Diablo Range population as containing about 280 breeding pairs (as of 2014).

USGS has estimated the occupancy, breeding success, and abundance of territorial pairs of golden eagles in the Diablo Range (Wiens et al. 2015); an additional USGS study focused on the APWRA and surrounding region (Kolar and Wiens 2017), and a more recent study focused on adjacent Contra Costa County (Wiens et al. 2020). A total of 138 territorial pairs of golden eagles were observed during surveys completed in the 2014 breeding season, representing about one-half of the 280 pairs (560 individuals) that the authors estimated to occur in the 1,996-square-mile region sampled. The results from Wiens et al. (2015) were further described specifically for the region surrounding the APWRA in Kolar and Wiens (2017). This recent work supports the current USFWS management guidelines for golden eagles, which considers surveys for occupied eagle territories when the territories may overlap with wind energy projects. The findings of the 2017 study indicated that the average nearest-neighbor distance of simultaneously occupied territories was approximately 2.0 miles. This information is consistent with the approach to nesting eagle surveys in PEIR Mitigation Measure BIO-8a, which requires “Surveys to locate eagle nests within 2 miles of construction….” The applicant has informed the County that at the recommendation of the USFWS, they have coordinated with USGS regarding eagle nests within the APWRA region, and have received nest information from USGS. USGS expressed concerns about the sensitivity of the nest locations and requested that the information not be distributed publicly. However, nesting within the APWRA and areas within 3.2 kilometers (km) (2 miles) of the APWRA (i.e., golden eagle territories that are likely to be at least partially within the APWRA) have consistently recorded from 9 to 11 golden eagle pairs with 3 to 4 nesting attempts and 0 to 3 successful nestings in surveys performed in 2014, 2015, 2016, and 2018 (Wiens and Kolar 2019). These territories were found to have fledged a total of 0 to 4 young per year. These numbers represent approximately 10% of the golden eagle population of the Diablo Range (Wiens and Kolar 2019). The APWRA also supports a remarkably large number of nonbreeding, subadult golden eagles, which are present in the APWRA at approximately four times their density elsewhere in the Diablo Range. Wiens and Kolar (2019) interpret these results as indicating "potential ~~disturbances~~ disturbances caused by operating wind turbines at APWRA had little to no effect on the distribution and territory size of golden eagles" but that "territorial pairs of golden eagles at APWRA may experience a high rate of mortality and territory turnover (i.e., mate replacement) relative to the surrounding region, as shown by the high proportion of subadult pair members." This ~~information~~ information supports the approach to nesting eagle surveys in the PEIR, which requires surveys to be ~~conducted~~ conducted during the nesting season prior to construction in order to determine nesting status and locations at the time of construction.

Considering the information currently available, it is likely that the current estimate of 718 individuals in BCR 32, currently used by USFWS to estimate cumulative effects on golden eagles, is an underestimate. The USGS study estimates that there are 280 territorial pairs (i.e., a breeding population of 560 individuals) within the Diablo Range (Wiens et al. 2015:13). The Diablo Range encompasses approximately 2% of the total size of BCR 32. While eagle density is likely to vary dramatically over the landscape within BCR 32, it is unlikely that variability is so high that 78% of the population occupies just 2% of BCR 32, with only 22% of the population scattered throughout the remaining 98% of the BCR. It is much more likely that BCR 32 carries more than 718 individuals. This inference is supported by the CDFW habitat model for golden eagle (CDFW 2016), which identifies habitat throughout a large fraction of BCR 32.

USFWS requires that analysis of cumulative effects on golden eagle populations consider the local area population (LAP). The LAP is calculated for golden eagles based on the number of eagles within 109 miles (the golden eagle natal dispersal distance) of a project site (U.S. Fish and Wildlife Service 2013). For the proposed project, the LAP encompasses approximately 29,600 square miles (excluding the Pacific Ocean and San Francisco Bay). The entire Diablo Range subject to study by USGS is within the Mulqueeney LAP for golden eagles, occupying approximately 7% of the Mulqueeney LAP. Therefore, 7% of the LAP includes all 560 individuals. The remaining 93% of the Mulqueeney LAP supports significant areas with suitable habitat (generally oak or pine woodlands in a grasslands matrix) in the Coast Ranges north of San Francisco Bay and substantial areas of suitable habitat south of the Diablo Range that USGS did not survey. Considering the available information, it is likely that the Mulqueeney LAP comprises substantially more than 560 individuals. For example, if one were to conservatively assume that the remaining 93% of the Mulqueeney LAP supports only 50% of the density of eagles on average that the Diablo Range supports, then another 280 eagles may reside within the LAP, outside the Diablo Range. Under this illustration, at least 840 individuals are likely to make up the Mulqueeney LAP.

Hunt et al. (2017) recently examined demographic data for the ~~region surrounding~~ Diablo Range, including the APWRA, and estimated that the annual reproductive output of 216–255 breeding pairs would have been necessary to support published estimates of 55–65 turbine blade-strike fatalities per year, concluding that the area has "a stable breeding population, but one for which any further decrease in vital rates would require immigrant floaters [subadults and nonbreeding adults] to fill territory vacancies." This estimate would indicate that the 280 territorial pairs present in the Diablo Range would likely be adequate to maintain the region's golden eagle population, but with population reductions possible if turbine-caused mortality were to increase substantially. USFWS has expressed a similar opinion, asserting that "[t]he high incidence of subadults as territorial breeding pair members, and high turnover rates of individual pair members, indicates the APWRA is an ecological sink, continually attracting golden eagles into prime foraging and nesting habitat that is of high risk to eagles, and for which survivorship is low" (U.S. Fish and Wildlife Service 2019a).

Field Studies

Between June 2019 and June 2020, the project applicant performed surveys and evaluations of project site use by golden eagles. These included eagle use surveys, eagle habitat assessments, and eagle nest surveys, all reported in the *Avian Survey Report for the Mulqueeney Ranch Wind Repowering Project* (ICF 2020b).

Eagle use survey locations were selected to be consistent with survey protocols recommended in Appendix C of the USFWS's Eagle Conservation Plan Guidance (2013). Surveys were conducted at eight eagle use count (EUC) locations that together cover approximately 50% of the area within 1 km of proposed turbine locations. EUC locations consisted of three-dimensional survey plots with an 800-meter radius that extended 200 meters vertically and that were placed in areas that provide good visibility of the project site and vicinity. Surveys at each location were conducted for a 1-hour duration, twice per month over a 1-year period. Each location was surveyed during a range of daylight hours. The time and position of each eagle was recorded, along with the duration of observation of each eagle flying within the plot (durations not recorded for perched eagles). Observations also recorded weather, distances traveled by eagles on the plot, and notes on the age class and behavior of each eagle. Results indicated golden eagle detections at all survey plots, with one bald eagle detection in January 2020. Observed eagle flight times averaged 0 to 2 minutes per hour of observation time, which is very similar to the APWRA average based on 2005 to 2013 data reported by ICF (2016). In most of the survey, detections averaged less than 1 minute per survey hour, with a concentration of eagle activity (1 to 2 minutes per hour) at survey location EUC-07 near the northwest corner of the project site. Eagles were only detected in 8% of surveys, which is half of the rate reported for the APWRA as a whole. Results generally indicate lower golden eagle use of the project site than is typical for the APWRA as a whole.

USGS has conducted eagle nesting surveys in the Altamont Pass region. Surveys for evidence of occupancy and reproduction have been conducted by USGS in 2014–2016, 2018, and 2020. Generally, these surveys were conducted within a randomly selected grid of survey cells to record the location, number, age, and behaviors of all golden eagles detected. Perches, flight paths, territorial displays, and nest location were recorded to determine activity centers used by eagle pairs. ICF biologists coordinated with USGS staff to obtain data on nesting eagles and pair activity centers within 2 miles of the project site for the study up to the 2018 survey year and to obtain the results of surveys conducted in 2019 and 2020; results are reported by ICF (2020). USGS surveyors have documented four nests associated with seven pair activity centers, within 2 miles of the project site, although two of these pair activity centers are more than 2 miles from any proposed turbine locations.

Fatality Monitoring Results

As noted in the above discussion of avian fatality monitoring, the present analysis considers three monitoring studies not considered in the PEIR: an additional 2 years of monitoring for birds and bats at Vasco Wind (Brown et al. 2016), 3 years of monitoring at Golden Hills (H. T. Harvey & Associates 2020), and 1 year of monitoring at Golden Hills North (Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a).

Golden eagle ~~mortality~~ fatality rates at Golden Hills included 6 fatalities in the first year, 14 in the second, and 9 in the third; these rates indicate 0.11 fatalities/MW/year (H. T. Harvey & Associates 2020), were 39% higher than baseline, non-repowered conditions reported in the PEIR. These rates are also higher than the rates at any of the three repowered projects used to generate estimates in the PEIR. The monitoring report observed that all of its golden eagle ~~mortality~~ fatality rates may be overstated as a consequence of bias attributable to the presence of old turbines near the Golden Hills site that provided perching and nesting opportunities for raptors, including golden eagles, which were seen perching on them on several occasions (H. T. Harvey & Associates 2018a:46, 50). In general, the authors of the Golden Hills reports noted that the primary conclusions from the 3 monitoring years were that the golden eagle ~~mortality~~ fatality rate was high compared to other recent APWRA studies.

The first year of fatality monitoring is now available for the Golden Hills North project (Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a). For Golden Hills North, the golden eagle fatality rate of 0.065 fatalities/MW/year is somewhat higher than the average for all repowered projects, 0.053 fatalities/MW/year.

Bat Studies

Behavioral Studies

The APWRA supports habitat types suitable for maternity, foraging, and migration for special-status and common bats. Several of these species are susceptible to direct mortality through collision or other interactions with wind turbines. Seven species of bat have been documented as fatalities in the APWRA: big brown bat (*Eptesicus fuscus*), little brown bat (*Myotis lucifugus*), California myotis (*Myotis californicus*), western red bat, hoary bat, silver-haired bat (*Lasionycteris noctivagans*), and Mexican free-tailed bat (Insignia Environmental 2012:47–48; ICF 2016; H. T. Harvey & Associates 2020; Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~ 2020a). Hoary bats and Mexican free-tailed bats have made up the majority of documented fatalities; some fatalities of the western red bat, a California Species of Special Concern, have also been recorded. Other than fatality records, occurrence data for bat species in the APWRA are limited, and expectations of presence are generally based on known ranges and habitat associations. However, pre- and post-construction acoustic survey data from the recently repowered Vasco Winds facility in the Contra Costa County portion of the APWRA indicated bat activity in all three seasons in which surveys were conducted, with a spike in activity in the fall (Pandion Systems 2010; Szewczak 2013). Similar results are reported at Golden Hills North, where "Bat fatalities were uncommon during winter. From spring through fall, the fatality rate for Mexican free-tailed bats [peaked] during spring migration (May/June) and fall migration (September/October). Hoary bat fatalities also peaked in fall but were proportionately less common in spring. Western red bat fatalities also were most common during the fall migration season" (Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~ 2020a). Monitoring done at the Golden Hills project suggests that approximately one-third to one-half of total annual bat fatalities occur during the August-September period, with both migratory and nonmigratory bats experiencing peak annual fatality rates during that period (H. T. Harvey & Associates 2020).

Bat biology certainly affects fatality risk at wind energy facilities. Studies at wind energy facilities in North America generally show strong seasonal and species-composition patterns in bat fatalities, with the bulk of fatalities consisting of migratory species and occurring in late summer to mid-autumn. As in other parts of North America, the majority of documented fatalities in the APWRA have occurred during the fall migration season and have consisted of migratory bat species.

Behavioral studies of bats also illuminate understanding of how and why bat fatalities occur at wind turbines; relevant information not presented in the PEIR (Alameda County Community Development Agency 2014) indicates:

- Most bat fatalities represent “tree bats”, which are migratory species that typically forage in the forest canopy (the hoary bat, which is the bat most frequently found in APWRA fatality surveys, is a tree bat). The bats evidently regard wind turbines as a sort of tree and fly toward them, and toward their upper reaches, where they suffer mortality (Allison et al. 2019; Arnett et al. 2016; Cryan et al. 2014a).
- Bats preferentially forage at turbines (Foo et al. 2017).
- Bats are attracted to turbines, especially under certain conditions, approaching turbines from downwind on moonlit nights (Cryan et al. 2014a), especially at wind velocities lower than about 5–6 meters per second (m/s); at higher wind speeds, bats avoid the rotor-swept zone (Wellig et al. 2018).
- Some fraction of fatalities are caused by barotrauma, rather than by turbine blade strike (Baerwald et al. 2008; Grodsky et al. 2011).
- Curtailment has been a highly effective mitigation strategy, with the latest algorithms achieving fatality reductions of more than 80% with about 3% loss of turbine output (Hayes et al. 2019).
- Curtailment during the peak migration period has been shown to greatly reduce bat fatalities (Smallwood and Bell 2019).
- Wind energy developments kill over 600,000 bats annually in the coterminous U.S. (Hayes 2013). Due to the proliferation of wind energy developments, white-nose syndrome (disease), insect die-off, and intrinsically low bat reproductive rates, there has been a recent measurable decline in hoary bat populations in the Pacific Northwest (Frick et al. 2017), and population models suggest that despite the current abundance of this species (ca. 2.5 million bats), declines in abundance with local extirpations are possible in the foreseeable future if currently observed ~~mortality~~ fatality rates are not reduced (Rodhouse et al. 2019).
- Hoary bats in North America are migratory, overwintering in southern California and Mexico, so hoary bat fatalities recorded in the APWRA during the fall migration may in large part represent bats from northern areas such as the Pacific Northwest and western Canada (Baerwald et al. 2014; Cryan et al. 2014b; Weller et al. 2016).

Additional discussion of potential biases resulting from comparisons of this and other studies are presented in the analysis of potential project impacts on bats.

Fatality Monitoring Results

Data collected from 2005 to 2011 identified a total of 22 fatalities over a 7-year period within the APWRA, resulting in an average rate of between zero and six bat fatalities per year (ICF 2016). These extremely low fatality rates were due at least in part to the monitoring program’s design, which was focused on bird mortality, and particularly on mortality of raptors, which have much larger body size than bats and accordingly are easier to detect following a fatality event. As previous study methods were not designed to generate defensible bat fatality rates, and as new generation turbines may pose novel threats to bats, assumptions of species vulnerability based on extrapolation from the older turbine technologies present in the APWRA are not necessarily valid (Alameda County Community Development Agency 2014).

As noted in the above discussion of avian fatality monitoring, the present analysis considers three monitoring studies not considered in the PEIR: an additional 2 years of monitoring for birds and bats at Vasco Wind (Brown et al. 2016), 3 years of monitoring at Golden Hills (H. T. Harvey & Associates 2020), and 1 year of monitoring at Golden Hills North (Great Basin Bird Observatory and H.T. Harvey & Associates ~~2020~~2020a).

The Golden Hills fatality monitoring results represent the first use of scent-detection dogs for an extended period to conduct fatality searches in the APWRA (H. T. Harvey & Associates 2018a:xii; Smallwood 2018[2]). This approach yielded an estimate of 606 bat ~~mortalities~~ fatality during the first year of monitoring, 524 during the second year, and 612 during the third year. The Golden Hills data (H. T. Harvey & Associates 2020) are noteworthy for the use of search dogs (*Canis familiaris*) and, to a limited extent[3], 7-day search intervals rather than the 28-day search intervals that were used for most of the baseline and repower mortality estimates presented in the PEIR. The use of different search methods make comparison with the PEIR's baseline data difficult (H. T. Harvey & Associates 2018a:51); in particular, detection rates for bats are much higher with the use of dogs and 7-day search intervals than with the use of unaided human searchers and 28-day search intervals (H.T. Harvey and Associates 2020:v). Similar detection methods were also used at Golden Hills North and Vasco Winds, with similarly high detection rates for bats; thus ~~mortality~~ fatality rate estimates for the proposed project are based upon the detection rates observed at these three projects, disregarding the older data for the Buena Vista and Diablo Winds projects. Further work by Smallwood et al. (2019) clearly establishes that use of trained dogs and their handlers in detection surveys is essential to effective estimation of bat fatalities, and also provides estimates of correction factors to identify ~~mortalities~~ fatalities outside the search area.

Monitoring results on both Golden Hills and Golden Hills North have documented the majority of fatalities as Mexican free-tailed bats (*Tadarida brasiliensis*) and hoary bats (*Lasiurus cinereus*); however, several other species were affected to a lesser degree, most notably the western red bat (*Lasiurus blossevillii*), a California Species of Special Concern, with an average fatality rate of 0.16/MW/year.

Micro-Siting Studies

The PEIR (Alameda County Community Development Agency 2014) outlined a mitigation strategy that, among other measures, recognized the potential benefits of careful micro-siting of turbines in minimizing effects on avian species. Since preparation of the PEIR, this mitigation strategy has been initiated for several proposed projects in the APWRA. Several studies, undertaken both before and after issuance of the PEIR, used a generally similar approach involving map-based collision hazard

[2] Smallwood (2018) conducted surveys using detection dogs at the Golden Hills and Buena Vista sites for a limited period (compared with the overall Golden Hills study described in H. T. Harvey & Associates 2018a, 2018b).

[3] Surveys were performed for all turbines at 28-day intervals, and 7-day surveys were additionally performed at a randomized subset of 16 turbines; a different group of 16 turbines was selected in each of the three monitoring years.

models to site turbines (Smallwood and Neher 2009, 2016a, 2017). However, many of these projects were never constructed. Additional studies, such as Bell (2017), which tracked golden eagles using satellite telemetry, have also supported map-based collision hazard models. Smallwood and Neher (2010a, 2011) used micro-siting analysis for the Vasco Winds and Tres Vaqueros projects in Contra Costa County; however, because the Tres Vaqueros project was never constructed, no results are available for interpretation. Smallwood and Neher later conducted micro-siting for the proposed Patterson Pass Repowering Project. Patterson Pass was authorized by the County with completion of the PEIR in 2014, but has not yet been constructed. Additionally, Smallwood and Neher (2016b) conducted micro-siting at the first Sand Hill repowering project (proposed in 2016 but not constructed, and different from the Sand Hill project approved in 2020). Smallwood and Neher (2016c) also completed micro-siting studies for the Summit Winds project that is now under construction and anticipated to begin commercial operations in early 2021. Smallwood and Neher (2018) and Estep (2019) both performed micro-siting studies for the second Sand Hill project, approved in 2020 but not yet under construction; thus there are no fatality monitoring results available yet for either the Summit Wind or Sand Hill Wind projects. Smallwood and Neher also conducted micro-siting studies for the Golden Hills and Golden Hills North repowering projects (following publication of the PEIR) for which fatality monitoring results are available. In summary, of multiple micro-siting studies undertaken in the APWRA, only three—Vasco Winds, Golden Hills, and Golden Hills North—have been associated with projects that were subsequently completed and for which monitoring results are available.

The Golden Hills and Golden Hills North studies used collision hazard models to site turbines, as did the other studies, with the intent of minimizing avian collision risk. The Golden Hills project was subsequently built, and the 3 years of postconstruction fatality monitoring have been published (H. T. Harvey & Associates 2020); similarly, the Golden Hills North project has been built, and the first ~~year~~ two years of postconstruction fatality monitoring ~~has~~ have been published (Great Basin Bird ~~Observatory~~ Observatory and H. T. Harvey & Associates ~~2020~~ 2020a and 2020b). For the Golden Hills project, Smallwood and Neher (2017) and Smallwood (2018) reviewed a draft and final of the first-year monitoring results and prepared a report and addendum, discussing the effectiveness of the micro-siting effort and whether the collision hazard models used to guide micro-siting were effective. The report states that the collision hazard models have improved over time, and that continued adjustments may improve the model performance. The report also highlighted that prioritizing fatality minimization for one species—golden eagle, for example—can result in putting other species at greater collision risk. Additionally, the addendum to the 2017 report stated that “the collision hazard models were likely effective at minimizing golden eagle fatalities in the absence of grading …” and noted that “… grading for wind turbine pads and access roads was extensive.” Thus, Smallwood (2018) effectively cited topographic changes due to new access road and turbine pad construction as a potential cause for an increase in golden eagle mortality at Golden Hills.

Smallwood and Neher (2017) noted that “Map-based collision hazard models of each successive repowering project benefitted from lessons learned from past efforts on repowering projects …” Although a number of micro-siting studies have been prepared, definitive conclusions regarding the effectiveness of micro-siting efforts are limited by the small sample size of projects completed for which fatality monitoring results are available (only Vasco Winds and Golden Hills – including Golden Hills North – have fatality monitoring results available). However, in general, the approach among all repowered projects, regardless of whether they were constructed, has been similar. Overall, the micro-siting approach—and the studies completed to date—are consistent with and support the approach used in the PEIR (Mitigation Measure BIO-11b) that requires micro-siting for each subsequent project to "… use the results of previous siting efforts to inform the analysis and siting methods as appropriate such that the science of siting continues to be advanced." Recent results and new information, such as the influence that grading may have on micro-siting, may be useful in subsequent micro-siting efforts and will be addressed in future studies consistent with the direction of the PEIR. Although the efficacy and benefits of micro-siting currently remain uncertain, each successive project and its micro-siting program is anticipated to benefit the next one until repowering of the APWRA as defined in the PEIR is complete.

Other Terrestrial and Aquatic Field Studies

To assess existing conditions and document biological resources in the approximately 4,600-acre project site, ICF conducted terrestrial and aquatic field surveys in June, July, August, and October 2019 and June 2020. The surveys consisted of mapping vegetation community types, evaluating special-status plant and wildlife habitat, and performing an aquatic resource delineation. The aquatic resource delineation was undertaken with the purpose of characterizing potential waters of the state and waters of the United States, including wetlands, in the project site. Detailed methods for terrestrial and aquatic resource surveys conducted in the project site are described in the Biological Resources Report for the Mulqueeney Ranch Wind Repowering Project (ICF 2020a).

3.4.2 Environmental Impacts

This section assesses the impacts on biological resources that could result from construction and maintenance of the proposed project.

3.4.2.1 Methods for Analysis

Impact Mechanisms

Biological resources could be directly or indirectly affected during project implementation. The following impact mechanisms were analyzed to assess project-related impacts on biological resources at the project site. For those impact mechanisms involving ground disturbance, GIS software was used to calculate land cover impacts by overlaying the project footprint on the land cover layer and assessing the acres of overlap for each land cover type.

- Permanent grading, widening, and resurfacing of some of the existing roads and constructing some sections of new road to accommodate construction. Existing roads would be widened to 24 feet.
- Permanent road improvements on Patterson Pass Road based on the final transportation route, including improvements to the project site entrances if required to accommodate the turning radii of equipment.
- Permanent replacement or reinforcement of existing culverts with larger culverts to provide adequate size and strength for construction vehicles.
- Permanent removal of the five existing meteorological towers and construction of up to three new meteorological towers with access roads and maintenance areas.
- Permanent excavation to support construction of new turbine foundations.
- Permanent excavation for construction of a new substation adjacent to the PG&E Tesla Substation.

- Temporary ground disturbance associated with trenching to install underground power collection system.
- Temporary ground disturbance associated with the staging area and crane pads.
- Temporary stockpiling and side-casting of soil, construction materials, or other construction wastes.
- Temporary short-term noise from equipment during construction activities.
- Temporary disturbance associated with operations and maintenance (O&M) activities.
- Ongoing avian or bat collision with wind turbines.

Impact Assumptions

Impacts on biological resources are based on the following assumptions about the project.

- Construction activities are expected to occur over a 7-month period.
- All ground-disturbing activities would occur during dry weather.
- All equipment staging, materials storage, and vehicle parking would be within the proposed 15.6-acre staging area, to be located east of Patterson Pass Road near the proposed substation and adjacent to the PG&E Tesla substation and within the limits of construction for each turbine site or on existing access roads.
- No new operations and maintenance buildings would be required for project implementation.
- The widening of existing access roads would be considered a permanent loss of upland habitat for terrestrial species unless road widening is temporary, only to support construction.
- Regrading and resurfacing of existing access roads is not considered an impact on upland habitat for terrestrial species because the compacted roads do not provide burrowing habitat or refugia for terrestrial species.
- No suitable habitat for special-status fish species (including green sturgeon [*Acipenser ~~medirostris~~ medirostris*], delta smelt [*Hypomesus transpacificus*], central California coastal steelhead Distinct Population Segment [DPS] [*Oncorhynchus mykiss*], and Central Valley steelhead DPS [*~~Oncorhynchus~~ Oncorhynchus mykiss*]), or designated critical habitat for these species occurs at the project site. Therefore, potential impacts on fish species and their critical habitat are not discussed in this impact analysis.
- Wildlife species listed in Table 3.4-3 as having low potential to occur at the project site were identified as such because there is very limited suitable habitat for the species or there is no suitable nesting/breeding habitat at the project site. Based on the small amount (6%) of the project site that would be disturbed, the potential for these species to be affected is considered negligible. ~~Therefore, wildlife species with low potential to occur at the project site are not discussed in this impact analysis.~~ Species such as longhorn fairy shrimp and northern legless lizard are not expected to be impacted by the project and are not discussed in this impact analysis. Several bird species are considered potential migrants through the project site but have a low likelihood for onsite breeding, including California condor, long-eared owl, greater sandhill crane, yellow-breasted chat, yellow warbler, Vaux's swift, and least Bell's vireo. While these species are not further discussed in the construction impact analysis, measures requiring

preconstruction nesting bird surveys and no disturbance buffers around active nests during construction would provide protections to any breeding birds.

Avian Fatality Analysis Methods

Fatality Rates

Most commonly used estimators of avian fatalities at wind development projects calculate the rate at which birds are killed. Historically, the most commonly used metric has been the number of birds killed per MW per year, where MWs are measured as the rated nameplate capacities of the turbines. The rated nameplate capacity of a turbine is the amount of power it can generate under its ideal conditions (different turbines are designed to operate most efficiently under different conditions). The number of fatalities per MW per year has been used most often because it facilitates comparisons across a number of different turbine types with different sizes and rated nameplate capacities. The fatality rate is then multiplied by the total number of MWs in the facility, to obtain the estimate of the total number of birds killed each year at the facility. This metric was used in the PEIR (Alameda County Community Development Agency 2014). For the purpose of this SEIR and for potential use in evaluating future repowering projects, another metric has been considered by the County: birds killed per hectare[4] of rotor-swept area[5] (RSA) per year. This metric has the advantage of mechanical plausibility; intuitively, a larger RSA has a greater probability of intercepting a bird in flight. Such a metric could provide for more representative comparisons, because of increased MW output per turbine in recent years. For example, although a 4.2-MW-rated turbine with 40% more output than a 3.0-MW-rated turbine under the PEIR metric (~~mortality~~ fatalities/MW) would represent a potentially 40% increase in mortality per turbine, the 4.2-MW turbine would have only 20% more RSA, and thus lower potential of bird strikes per MW. Additionally, some resource agencies such as the USFWS have adopted specific take estimation models for some species such as golden eagle, which use RSA as one of the primary variables affecting the take estimate (U.S. Fish and Wildlife Service 2013). The analysis given here uses both metrics, fatalities per MW and fatalities per unit RSA, to derive a range of possible fatality rate estimates.

The estimate of the number of birds killed annually for each project is based on available monitoring data for each project, and the total number of MWs that were installed (referred to as the *total ~~installed~~ installed capacity*) of each project, and the rotor blade lengths of all turbines installed at each project.

In order to estimate fatality rate changes associated with repowering, the average of the annual estimates of each fatality rate from the 2005–2011 bird years (n=7 years) provided by the Alameda County Avian Fatality Monitoring Program (ICF 2016) was used to generate a baseline fatality rate for old-generation turbines only (i.e., results from the Diablo Winds and Buena Vista repowering projects were excluded because they are not considered old-generation turbines). Lacking RSA data for the old-generation turbines, fatality rates for these are not calculated on the basis of RSA; RSA fatality rates are only calculated for repowered projects.

Averaged rates were used because annual fatality rates vary considerably from year to year. Fatality rates for repowered projects were based on post-construction monitoring results presented for the

[4] A hectare is an area of 10,000 square meters, approximately 2.5 acres.

[5] Rotor-swept area (RSA) is the area of the plane within which the wind turbine rotor blades move, calculated as RSA = πr^2 where π is approximately 3.14 and r is the length of the rotor blade in meters.

Buena Vista (Alameda County Community Development Agency 2014), Diablo Winds (Alameda County Community Development Agency 2014), Golden Hills (H. T. Harvey & Associates 2020), Golden Hills North (Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~2020a), and Vasco Wind (Brown et al. 2016) projects. Again, annual averages were used as the basis for comparison. Of these five repowered projects, Buena Vista comprises 38 1-MW turbines, Diablo Winds has 31 660-kW turbines, Golden Hills has 48 1.79-MW turbines, Golden Hills North has 20 2.3-MW turbines, and Vasco Winds has 34 2.3-MW turbines (Insignia Environmental 2012; Brown et al. 2013; ICF 2016; Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~2020a). Although there is considerable range in turbine sizes among these five projects, they are all considered new-generation turbines relative to the rest of the turbines installed in the APWRA. The annual fatality rates for these five repowering projects are presented in Tables 3.4-4 and 3.4-5; Table 3.4-4 also shows the average of the annual fatality rates at non-repowered turbines for comparison. Note that the rate estimates available from new-generation repowered turbines in the APWRA represent uncertain predictors of rates that would occur at the Mulqueeney site. This is because the five existing repowered project sites each have different turbine types and are located in five relatively small, distinct areas with site-specific geographic, topographic, and other ecological conditions, and because the species addressed are not evenly distributed throughout the APWRA.

The analysis was applied to species, listed in Table 3.4-4, representing four groups: focal species, species of local conservation concern, raptors ~~(including owls and turkey vultures [*Cathartes aura*]),~~, and non-raptors. *Focal species* identified in the PEIR included American kestrel, burrowing owl, golden eagle, and red-tailed hawk~~,~~. Other species addressed herein include barn owl (a raptor), loggerhead shrike~~,~~ (CDFW species of special concern), prairie falcon (*Falco mexicanus*, a raptor), Swainson's hawk (listed as threatened under CESA), white-tailed kite (fully protected under the California Fish and Game Code), tricolored blackbird (listed as threatened under CESA), ~~and barn owl.~~ Vaux's swift (CDFW species of special concern), yellow-breasted chat (CDFW species of special concern), and yellow warbler (CDFW species of special concern). California condor, a fully protected species, is not listed in Table 3.4-4 because no fatalities have been recorded in the APWRA. The condor may occur within the APWRA and thus there is some potential for mortality from blade strike.

The baseline number of fatalities for each species and species group calculated as outlined above was compared to the number of fatalities expected to occur as a result of repowering. The number of fatalities expected to occur as a result of repowering was based on the 450 MW build-out scenario for the larger of two program alternatives examined in the PEIR, and on the size of each of the projects measured in MWs, as outlined in Chapter 2, *Project Description*. Although the updated cumulative project list indicates that only 365 MW is now currently operating, under construction or proposed, the cumulative long-term potential for buildout of repowering addressed in the PEIR remains 450 MW. Analysis of the fatality rates per MW and per hectare of RSA, as applied to the project, is provided below in Section 3.4.2.3, *Impacts and Mitigation Measures*, under Impact BIO-11.

Table 3.4-4. Annual Adjusted Fatality Rates per MW for Non-Repowered and Repowered APWRA Turbines

		Repowered					
Species/Group	Not Repowered[a]	Buena Vista[b]	Diablo Winds[c]	Golden Hills[d]	Golden Hills North[e]	Vasco Winds[f]	Average[g]
American kestrel	0.590	0.110	0.09	0.097	0.174	0.284	0.140
Barn owl	0.242	0.026	0.02	0.029	0.022	0.022	0.024
Burrowing owl	0.775	0	0.84	0.190	0	0.056	0.329
Golden eagle	0.081	0.073	0.01	0.113	0.065	0.044	0.053
Loggerhead shrike	0.188	0	0	0.031	0	0.024	0.024
Prairie falcon	0.020	0.026	nd	0.004	0.022	0.009	0.014
Red-tailed hawk	0.439	0.160	0.2	0.566	0.152	0.210	0.264
Swainson's hawk	0.001	0	nd	0	0	0	0
Tricolored blackbird	nd	0	nd	0.018	0.022	0.021	0.020
Vaux's swift	nd	0	nd	0.182	0	0.088	0.115
White-tailed kite	nd	0	nd	0.057	0	0	0.017
Yellow-breasted chat	nd	0	nd	0	0.022	0	0.003
Yellow warbler	nd	0.026	nd	0.068	0.022	0.142	0.093
All raptors	2.431	0.372	1.210	1.148	0.587	0.645	0.876
All native non-raptors	4.505	1.510	2.510	7.592	9.435	2.035	5.474
All bats	nd	0.792	nd	6.758	14.587	3.208	6.355
Hoary bats	nd	0.237	nd	2.654	2.457	1.006	1.919
Mexican free-tailed bats	nd	0.053	nd	3.674	11.413	1.881	4.011

Units are fatalities/MW/year.

MW = megawatts; nd = no data, the data source did not address this species and it is not known whether ~~mortalities~~ fatalities occurred.

[a] Average of 2005–2011 bird years as reported in Table 3.4-10 of the PEIR (Alameda County Community Development Agency 2014), but using estimates to four significant digits, available in PEIR administrative record.

[b] Total fatalities for 3 years of monitoring, including raw data (with incidentals), and as adjusted using 5 different estimators; none of the estimators are given preference, so their mean value is used for rate determination. For some species no estimator was applied and observed ~~mortality~~ fatality numbers are used directly to estimate fatality rates. (Source: Insignia Environmental 2012).

[c] Average of 2005–2009 bird years as reported in Table 3.4-10 of the PEIR.

[d] Fatalities estimated in each of 3 years of monitoring, as reported in Appendices K, L and M of H. T. Harvey & Associates (2020). For golden eagle an estimator was not used and direct carcass counts are reported.

[e] Fatalities estimated in 1 year of monitoring, reported as "Extrapolated Adjusted Total Fatalities" in Table ES-1 of Great Basin Bird Observatory and H. T. Harvey & Associates (~~2020~~ 2020a). For barn owl, loggerhead shrike, prairie falcon, Swainson's hawk, tricolored blackbird, and white-tailed kit, no adjusted estimates are available and "on-plot survey" totals from Table 5 are shown. For golden eagle an estimator was not used and direct carcass counts are reported. For this species, the large size and relatively long persistence of the carcass means that detection probabilities are close to 1.0.

[f] Average of mean adjusted total ~~mortality~~ fatalities in each of 3 years of monitoring as reported in Table 28 of Brown et al. (2016).

[g] Mean for the five repowered facilities, weighted by the number of years of monitoring at each facility. For non-raptors (which mostly consist of small birds) and bats, Buena Vista and Diablo Winds data are disregarded due to evidence that due to long intervals between carcass surveys, these groups were underreported at those projects.

Table 3.4-5. Annual Adjusted Fatality Rates per Hectare RSA for Repowered APWRA Turbines

	Repowered					
Species/Group	Buena Vista[a]	Diablo Winds[b]	Golden Hills[c]	Golden Hills North[d]	Vasco Winds[e]	Average[f]
American kestrel	0.372	0.343	0.221	0.378	0.815	0.421
Barn owl	0.089	0.076	0.067	0.047	0.064	0.073
Burrowing owl	0	3.204	0.433	0	0.160	1.187
Golden eagle	0.245	0.038	0.256	0.142	0.126	0.148
Loggerhead shrike	0	0	0.071	0	0.069	0.060
Prairie falcon	0.089	nd	0.010	0.047	0.026	0.042
Red-tailed hawk	0.539	0.763	1.291	0.331	0.603	0.763
Swainson's hawk	0	nd	0	0	0	0
Tricolored blackbird	0	nd	0.040	0.047	0.061	0.050
Vaux's swift	0	nd	0.414	0	0.252	0.285
White-tailed kite	0	nd	0.129	0	0	0.039
Yellow-breasted chat	0	nd	0	0.047	0	0.007
Yellow warbler	0.089	nd	0.156	0.047	0.407	0.248
All raptors	1.258	4.615	2.617	1.277	1.850	2.768
All native non-raptors	5.100	9.573	17.304	20.533	5.842	12.853
All bats	2.676	nd	15.403	31.746	9.208	15.083
Hoary bats	0.800	nd	6.048	5.346	2.888	4.593
Mexican free-tailed bats	0.178	nd	8.373	24.838	5.399	9.451

Units are fatalities/ha RSA/year.

ha = hectare; RSA = rotor-swept area; nd = no data, the data source did not address this species and it is not known whether ~~mortalities~~ fatalities occurred.

[a] Total fatalities for 3 years of monitoring, including raw data (with incidentals), and as adjusted using 5 different estimators; none of the estimators are given preference, so their mean value is used for rate determination. For some species no estimator was applied and observed ~~mortality~~ fatality numbers are used directly to estimate fatality rates. Source: Insignia Environmental (2012).

[b] Average of 2005–2009 bird years as reported in Table 3.4-10 of the PEIR (Alameda County Community Development Agency 2014).

[c] Fatalities estimated in each of 3 years of monitoring, as reported in Appendices K, L and M of H. T. Harvey & Associates (2020). For golden eagle an estimator was not used and direct carcass counts are reported.

[d] Fatalities estimated in 1 year of monitoring, reported as "Extrapolated Adjusted Total Fatalities" in Table ES-1 of Great Basin Bird Observatory and H. T. Harvey & Associates (~~2020~~2020a). For barn owl, loggerhead shrike, prairie falcon, Swainson's hawk, tricolored blackbird, and white-tailed kit, no adjusted estimates are available and "on-plot survey" totals from Table 5 are shown. For golden eagle an estimator was not used and direct carcass counts are reported. For this species, the large size and relatively long persistence of the carcass means that detection probabilities are close to 1.0

[e] Average of mean adjusted total ~~mortality~~ fatalities in each of 3 years of monitoring as reported in Table 28 of Brown et al. (2016).

[f] Mean for the five repowered facilities, weighted by the number of years of monitoring at each facility. For non-raptors (which mostly consist of small birds) and bats, Buena Vista and Diablo Winds data are disregarded due to evidence that due to long intervals between carcass surveys, these groups were underreported at those projects.

Potential Biases in the Avian Fatality Analysis Methods

Several factors confound the comparison of avian fatality rates between old- and new-generation turbines. The fatality rates from non-repowered turbines were obtained while management actions were being implemented to reduce avian fatalities. These actions included the shutdown of turbines during the winter period, a time when winds are lowest but avian use of the area is highest for three of the focal species. In addition, hazardous turbines were being removed during the period of data collection. These actions in combination resulted in a reduction of avian fatality rates, tending to underestimate the differences between old-generation turbines and newer turbines because the newer turbines are not shut down during the winter period and none has been deemed hazardous enough to warrant removal.

The fatality rates from three of the five repowered projects are associated with turbines that are considerably smaller than those that would be used for the proposed project. However, as discussed in the PEIR (Alameda County Community Development Agency 2014), avian fatality rates are generally proportional to power generation capacity, which can be measured by the capacity rating of the turbine or by the rotor-swept area of the turbine. The PEIR used capacity to index fatality rates, whereas this analysis uses both metrics.

There is considerable variation in collision risk across the various topographies and geographies of the APWRA, presumably due in part to variations in abundance and use of these areas by different species. For example, burrowing owls were known to be abundant in the area around the Diablo Winds turbines when they were installed, and thus there is a relatively high rate (for new-generation turbines) of fatalities at these turbines. Conversely, no burrowing owl fatalities were detected in the Buena Vista project area in the 3 years of fatality monitoring after repowering. Thus, the fatality rates at the five repowered project sites may not be representative of the fatality rates likely to occur at other repowering project sites. Because of the variation between these projects, fatality rates from all five projects were used to provide a range in the estimates of total annual fatalities likely to occur as a result of repowering. Additionally, variation between survey years may be substantial. For example, the first-year fatality rate for red-tailed hawk at the Golden Hills project was more than twice that of the second-year fatality rate (H. T. Harvey & Associates 2020). The authors of the Golden Hills report did not offer a hypothesis for the substantial reduction in the fatality rate of red-tailed hawks observed during the second year; however, this difference illustrates the substantial variation that can occur even in a single study from year to year.

Finally, one of the biggest differences among all studies is variation in detection probability. *Detection probability* as used here refers to the probability that a turbine-related fatality is actually detected. There are various ways of measuring detection probability, the most common being the use of carcass placement trials to measure the rate at which carcasses are removed from the search area and the rate at which searchers detect carcasses given that they are still present. Detection probability varies among searchers, habitat types, seasons, years, carcass size, and it can be influenced by other factors as well.

The Alameda County Avian Fatality Monitoring Program measured detection probabilities in only one year, and these probabilities were used to estimate the number of avian ~~mortalities~~ fatalities in all years of the study. If detection probability varies considerably across years, such variation can also confound to an unknown degree comparisons of fatality rates and estimates of total fatalities across projects. A review of the available reports indicates that some progress has been made toward a unified approach to detection probability. The final reports for the Vasco Winds project (Brown et al. 2016) and the Golden Hills project (H. T. Harvey & Associates 2020), as well as the first-year report for the Golden Hills North Project (Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~2020a), have all reported fatality rates adjusted for overall detection probability, with the occasional exception of golden eagles, which have a detection probability of near 1.0 due to the large size and long persistence of carcasses.

Bat Fatality Analysis Methods

Fatality Rates

The assessment of bat species potentially at risk is based on a review of existing bat fatality data for the APWRA, species occurrence data in and around the program and project areas, the current understanding of those species' susceptibility to current-generation turbine–related mortality, and known trends in bat fatalities at wind energy facilities in general.

Methods used to conduct the analysis were similar to those used to assess the potential impacts on avian species. The analysis for fatality rate at non-repowered facilities was based on that presented in the PEIR (Alameda County Community Development Agency 2014), except that one source for bat ~~mortality~~ fatality information used in that analysis, Brown et al. (2013), erroneously reported overall bat fatality rates. Table 10 in Brown et al. (2013) reported adjusted fatality rates for bats in several ways, including using "national means" or "national averages" and several onsite trials with different size classes. As reported in that first-year monitoring report, the highest fatality rate was reported as 1.679 bats/MW/year considering the overall detection, otherwise known as the "big D" adjustment method. The PEIR used this fatality rate and an additional fatality rate from a nearby wind resource area to calculate estimated bat fatalities. By the time a final report was prepared addressing all 3 monitoring years (Brown et al. 2016), a ~~mortality~~ fatality rate of 1.679 bats/MW/year was reported in Table 30 for year one considering national averages. However, the average ~~mortality~~ fatality rate for 3 years using the "D" adjustment was actually 3.207 bats/MW/year. For this analysis, the corrected ~~mortality~~ fatality rates from the final Vasco Winds report were cited, i.e., a 3-year average of 3.207 bats/MW/year, which updates the methodology used in the PEIR analysis. The distinction is mooted, though, because impacts are evaluated solely on the basis of comparison to bat ~~mortality~~ fatality rates recorded at projects that used 7-day survey intervals to detect bat carcasses. This methodology, used at the Golden Hills, Golden Hills North, and Vasco Winds projects, delivered fatality rate estimates several times higher than those detected at the earlier projects where 28-day survey intervals were used (Tables 3.4-4 and 3.4-5), here interpreted as evidence of systematic underestimation of bat mortality in the older surveys.

Fatality rate numbers for non-repowered facilities were compared to fatality rates recorded for the repowered facilities (Buena Vista, Diablo Wind, Golden Hills, Golden Hills North, and Vasco Winds). The number of bat ~~mortalities~~ fatalities expected to result from repowering was based on the 450 MW cap alternative evaluated in the PEIR, as well as ~~mortalities~~ fatalities attributable to the Mulqueeney project.

Potential Biases in the Bat Fatality Analysis Methods

As noted in the PEIR (Alameda County Community Development Agency 2014), although the best available evidence was used to estimate the number of bat fatalities potentially resulting from implementation of the proposed program and projects, there was more uncertainty in these estimates than there was for bird fatality estimates. Because the Alameda County Avian Fatality Program was not designed to count bats, the baseline ~~mortality~~ fatality rate was likely underestimated. Moreover, because Vasco Winds is not representative of the entire program area, the PEIR cautioned that extrapolation of results from this site to other areas should be interpreted with caution. Finally, the nearby Montezuma Hills Wind Resource Area, while sharing some land use characteristics (e.g., grazing), supports more dryland farming than the APWRA and has a different topographical profile.

More recent analyses identify some additional biases and issues to consider when reviewing the bat fatality analysis methods. The Golden Hills and Golden Hills North monitoring programs used scent-detection dogs to conduct fatality searches. The authors of the Golden Hills report (H. T. Harvey & Associates 2018b) note that the use of scent-detection dogs as well as the shorter 7-day search interval "… clearly resulted in our detecting far greater numbers of bat fatalities than previously reported in the APWRA." The authors of the Golden Hills report also conclude that "… additional years of post-repowering data from different APWRA projects will be necessary before a confident assessment of the patterns and magnitudes of impacts on bats can be confidently assessed." It is also noteworthy that Vasco Winds, which used 7-day survey intervals but did not use dogs, estimated a lower bat ~~mortality~~ fatality rate than the surveys using both dogs and 7-day survey intervals. The Golden Hills North report (Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~2020a) notes that "overall detectability of bats on 7-day plots surveyed by detection-dog teams was 65%, whereas searcher efficiency alone for humans surveying for bats at 7-day intervals typically is <25%". It is thus plausible that bat ~~mortality~~ fatality rates observed at Golden Hills and Golden Hills North are most nearly representative of rates that would potentially result from the Mulqueeney project. Together, all these factors and biases illustrate the continued challenges associated with estimating bat fatalities for repowering projects.

3.4.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- 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.
- A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS.
- A substantial adverse effect on state- or federally protected wetlands (e.g., marshes, vernal pools, coastal wetlands) through direct removal, filling, hydrological interruption, or other means.
- Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites.
- 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 (HCP), NCCP, or other approved local, regional, or state HCP.

3.4.2.3 Impacts and Mitigation Measures

Impacts on biological resources could occur as a result of project construction and O&M activities. The project would primarily affect upland annual grassland habitat in the project site. Proposed project activities would result in a small amount of permanent and temporary impacts on state- and federally regulated aquatic resources. Special-status plant and wildlife species that occupy aquatic and upland habitats in the project site could be directly or indirectly affected by project activities. Wildlife species with similar habitat use (e.g., use similar habitat types, tree nesting species) were grouped in the impact discussions below. Mitigation measures that are incorporated from the PEIR (Alameda County Community Development Agency 2014) are noted at the end of each impact discussion. In some instances, the PEIR measures may have been modified for applicability to the project without altering the content of the measure. Modified measures are identified as *2020 Updated PEIR Mitigation Measure BIO-X* (where X = the PEIR Mitigation Measure that is being modified).

Table 3.4-6 shows the permanent and temporary impacts of project construction by land cover type. Each of the project layouts would have similar impacts; the layout with the most extensive impacts was used to calculate effects. Table 3.4-7 shows the impacts on upland grassland habitat by project component for construction and maintenance activities. Following the minimum 30-year life of the project, the components would be decommissioned and removed, however this analysis does not evaluate the decommissioning phase for which details are unknown at this time.

Overall, a small portion of the site—approximately 6% of the total area—would be disturbed during the construction phase of the project. This area constitutes the total project footprint. Less than 1% of the project site would be disturbed during O&M activities over the life of the project.

Table 3.4-6. Land Cover Impacts during Construction (acres)

Land Cover/Habitat Type	Permanent	Temporary	Total
Nonnative annual grassland	25.92	261.00	286.92
~~Forested~~Riparian (forested wetland)	0	≤0.001	≤0.001
Alkali wetland	0.03	0.53	0.56
Freshwater marsh	0	0	0
Scrub-shrub wetland	0	0	0
Vernal pool	0	0	0
Pond	0.02	0.10	0.12
Intermittent stream	0.01	0.11	0.12
Ephemeral stream	0	0.01	0.01
Scrub	0	0	0
Rock outcrop	0.04	1.93	1.97
Developed[a]	N/A	N/A	N/A
Total	**26.02**	**263.68**	**289.70**

[a] The acreage of impacts on the developed land cover type was not calculated because it is not a biological resource.
N/A = Not applicable, as developed areas on the project site do not provide habitat for sensitive biological resources.

Table 3.4-7. Upland Grassland Habitat Impact Summary for Construction and Maintenance (acres)

Activity	Permanent Impact	Temporary Impact
Construction		
Wind turbines, foundations, and pads	1.98	106.26
New access roads	11.48	32.60
Access road widening	9.27	52.96
Road radius improvements	2.56	5.04
Crane path	0	14.88
Temporary construction and staging area	0	15.19
Meteorological towers	0.06	1.50
Power collection system	0	33.33
New substation	0.68	1.92
Total	**26.02**	**263.68**
Maintenance[a]		
Turbine repair or replacement (0.1 acre every 10 years)	0	0.30
Access road maintenance (0.01 acre every 5 years)[b]	0	0.60
Total	**0**	**0.90**

[a] The operational period of the project is expected to be at least 30 years, but ground-disturbing O&M activities would only occur in operational years 5–30.

[b] Access road maintenance would primarily occur on existing graveled access roads, but some adjacent annual grassland habitat could be disturbed, estimated as 0.1 acre every 5 years.

Impact BIO-1: Potential for ground-disturbing activities to result in adverse effects on special-status plants or habitat occupied by special-status plants (less than significant with mitigation)

The project has the potential to affect special-status plants that could occur in grassland and aquatic habitats at the project site. Table 3.4-2 lists 20 special-status plants with a moderate to high potential to occur at the project site. One of these species—shining navarretia—has been previously documented adjacent to the southeastern edge of the project site. Because special-status plant surveys have not yet been conducted at the project site, the presence of shining navarretia or other special-status plants cannot be confirmed.

Ground-disturbing activities associated with project construction and maintenance could result in adverse effects on special-status plants or their habitat. Direct effects include those effects where plants may be removed, damaged, or crushed (seedlings) by ground-disturbing activities, the movement or parking of vehicles, and the placement of equipment and supplies. Ground disturbance can kill or damage mature individuals or eliminate their habitat. Excavation alters soil properties and may create conditions unsuitable for the growth of some species or favor their replacement by other species. The roots of shrubs and other perennial species are susceptible to damage from soil compaction by equipment or construction materials. Possible indirect effects on plants could result from erosion that degrades habitat or accidental ignition of a fire that damages or kills individuals.

Because these ground-disturbing activities could have substantial adverse effects on special-status plant species, if present, this impact would be potentially significant. This conclusion is consistent with the analysis presented in the PEIR (Alameda County Community Development Agency 2014), and the mitigation measures set forth in the PEIR would adequately address this impact.

Implementation of PEIR Mitigation Measures BIO-1a through BIO-1e would reduce this impact to a less-than-significant level. These measures, including but not limited to preconstruction surveys for the species, best management practices to avoid and minimize direct impacts of the project, or the establishment of exclusion zones, would be effective in reducing impacts to a less-than-significant level. The measures would determine if special-status plants are present in the areas of proposed ground disturbance and, if any are present, implement practices to avoid the impacts where feasible or minimize the impacts if complete avoidance is not feasible. Where special-status plants could be avoided, the suite of mitigation also requires protection of the special-status plants by training construction personnel and installing fencing or other barrier materials to ensure that construction equipment is excluded from the habitat occupied by special-status plants. A biological monitor would be required on site during construction activities to ensure that the avoidance measures are complied with in the excluded areas. Where special-status plants could not be avoided, compensatory mitigation would ensure that the affected special-status plant species are preserved at one or more off-site locations. If no locations are available for preservation, the project would be redesigned to avoid the plants.

No new mitigation measures are proposed; however, updates were made to three of the PEIR mitigation measures:

- PEIR Mitigation Measure BIO-1a was revised to update the CDFW survey protocol reference, which was reissued in 2018.
- PEIR Mitigation Measure BIO-1b was revised to specify that environmental sensitivity training is required for staff performing ground-disturbing activities and to indicate that off-road vehicle travel will also be minimized within the project footprint.
- PEIR Mitigation Measure BIO-1d was revised to provide more detail about the preserved habitat, instruments to use for preservation in perpetuity, requirement for a preservation or management plan and the contents of the plan.

2020 Updated PEIR Mitigation Measure BIO-1a: Conduct surveys to determine the presence or absence of special-status plant species

The project proponent will conduct surveys for the special-status plant species within and adjacent to all project sites. All surveys will be conducted by qualified biologists in accordance with the appropriate protocols.

Special-status plant surveys will be conducted in accordance with *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (California Department of Fish and Wildlife 2018) during the season that special-status plant species would be evident and identifiable—i.e., during their blooming season. No more than 3 years prior to ground-disturbing repowering activities and during the appropriate identification periods for special-status plants (Table 3.4-2), a qualified biologist (as determined by Alameda County) will conduct field surveys within proposed construction areas, and the immediately adjacent areas to determine the presence of habitat for special-status plant species. The project proponent will submit a report documenting the survey results to Alameda County for review and approval prior to conducting any repowering activities. The report will include the location and description of all proposed work areas, the location and description of all suitable habitat for special-status plant species, and the location and description of other sensitive habitats (e.g., vernal pools, wetlands, riparian areas). Additionally, the report will outline where additional species and/or habitat-specific mitigation measures are required. This report will provide the basis for any applicable permit applications where incidental take of listed species may occur.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

The project proponent will ensure that the following BMPs, in accordance with practices established in the EACCS, will be incorporated into the final project design and construction documents.

- Employees and contractors performing ground-disturbing activities, including construction and maintenance activities will receive environmental sensitivity training. Training will include review of environmental laws, mitigation measures, permit conditions, and other requirements that must be followed by all personnel to reduce or avoid effects on special-status species and sensitive habitats during construction activities.
- Environmental tailboard trainings will take place on an as-needed basis in the field. These trainings will include a brief review of the biology of the covered species and guidelines that must be followed by all personnel to reduce or avoid negative effects on these species during construction and maintenance activities. Directors, managers, superintendents, and the crew leaders will be responsible for ensuring that crewmembers comply with the guidelines.
- Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas to the extent practicable.
- Off-road vehicle travel outside the project footprint will be avoided and minimized to the extent possible within the project footprint.
- Material will be stockpiled only in areas that do not support special-status species or sensitive habitats.
- Grading will be restricted to the minimum area necessary.
- Prior to ground-disturbing activities in sensitive habitats, project construction boundaries and access areas will be flagged and temporarily fenced during construction to reduce the potential for vehicles and equipment to stray into adjacent habitats.
- Vehicles or equipment will not be refueled within 100 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area (i.e., a created berm made of sandbags or other removable material) is constructed.
- Erosion control measures will be implemented to reduce sedimentation in nearby aquatic habitat when activities are the source of potential erosion. Plastic monofilament netting (erosion control matting) or similar material containing netting will not be used at the project. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.
- Significant earth moving-activities will not be conducted in riparian areas within 24 hours of predicted storms or after major storms (defined as 1-inch of rain or more).
- The following will not be allowed at or near work sites for project activities: trash dumping, firearms, open fires (such as barbecues) not required by the activity, hunting, and pets (except for safety in remote locations).

PEIR Mitigation Measure BIO-1c: Avoid and minimize impacts on special-status plant species by establishing activity exclusion zones

Where surveys determine that a special-status plant species is present in or adjacent to a project site, direct and indirect impacts of the project on the species will be avoided through the establishment of activity exclusion zones, within which no ground-disturbing activities will take place, including construction of new facilities, construction staging, or other temporary work areas. Activity exclusion zones for special-status plant species will be established around each occupied habitat site, the boundaries of which will be clearly marked with standard orange plastic construction exclusion fencing or its equivalent. The establishment of activity exclusion zones will not be required if no construction-related disturbances will occur within 250 feet of the occupied habitat. The size of activity exclusion zones may be reduced through consultation with a qualified biologist and with concurrence from CDFW based on site-specific conditions.

2020 Updated PEIR Mitigation Measure BIO-1d: Compensate for impacts on special-status plant species

The project proponent will avoid or minimize temporary and permanent impacts on special-status plants that occur on the project site and will compensate for impacts on special-status plant species. Although all impacts on large-flowered fiddleneck, diamond-petaled California poppy, and caper-fruited tropidocarpum will be avoided, impacts on other special-status plant species will be avoided to the extent feasible, and any unavoidable impacts will be addressed through compensatory mitigation.

Where avoidance of impacts on a special-status plant species is infeasible, loss of individuals or occupied habitat of a special-status plant species occurrence will be compensated for through the acquisition, protection, and subsequent management in perpetuity of other existing occurrences at a ~~2:1 ratio (occurrences impacted: occurrences preserved).~~ minimum 2:1 ratio (occurrences preserved:occurrences impacted). For focal species identified in the EACCS (San Joaquin spearscale, big tarplant, Congdon's tarplant, palmate-bracted bird's-beak, Livermore Valley tarplant, and recurved larkspur), loss of individuals and occupied habitat will be compensated at 5:1, consistent with the EACCS. The project proponent will provide detailed information to the County and CDFW on the location of the preserved occurrences, quality of the preserved habitat, feasibility of protecting and managing the areas in-perpetuity, responsibility parties, and other pertinent information. The preserved habitat will be confirmed to support populations of the impacted species and will be preserved in perpetuity via deed restriction, establishment of a conservation easement, or similar preservation mechanism. A qualified botanist or plant ecologist will prepare a preservation plan or long-term management plan for the site containing at a minimum: a monitoring plan and performance criteria for the preserved plant population; a description of remedial measures to be performed in the event that performance criteria are not met; a description of maintenance activities to be conducted on the site, including weed control, trash removal, irrigation, and control of herbivory by livestock and wildlife; and an adequate funding mechanism to ensure long-term management of the preserved habitat. If suitable occurrences of a special-status plant species are not available for preservation, then the project will be redesigned to remove features that would result in impacts on that species.

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

The project proponents will retain a qualified biologist (as determined by Alameda County) to conduct periodic monitoring of decommissioning, repowering, and reclamation activities that occur adjacent to sensitive biological resources (e.g., special-status species, sensitive vegetation communities, wetlands). Monitoring will occur during initial ground disturbance where sensitive biological resources are present and weekly thereafter or as determined by the County in coordination with a qualified biologist. The biologist will assist the crew, as needed, to comply with all project implementation restrictions and guidelines. In addition, the biologist will be responsible for ensuring that the project proponent or its contractors maintain exclusion areas adjacent to sensitive biological resources, and for documenting compliance with all biological resource–related mitigation measures.

Impact BIO-2: Potential for the introduction and spread of invasive plant species to result in adverse effects on special-status plants and natural communities (less than significant with mitigation)

Construction activities have the potential to facilitate the introduction and spread of invasive nonnative plant species by removing vegetation and disturbing soils. Construction vehicles and machinery are primary vectors for the spread of such species. Control of the introduction and spread of invasive species is required for federal agencies under Executive Order 11312. The introduction and spread of invasive nonnative plant species as a result of activities associated with the program would constitute a significant indirect impact. However, implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and PEIR Mitigation Measures BIO-2, BIO-5c, and WQ-1 would reduce this impact to a less-than-significant level.

These measures would be effective at reducing impacts to a less-than-significant level by implementing practices to keep new invasive species from being transported into the construction area and keep existing populations from spreading within the construction area. Erosion and sedimentation control measures, in conjunction with restoration plans, would encourage reestablishment of non-invasive plant species. For annual grassland habitats, a restoration plan would be developed to restore the soils and plant species in temporarily disturbed areas to original conditions and prevent future disturbance from continued use of temporary access roads after construction is completed. Monitoring of all restored areas would document that habitat restoration achieves specific success criteria. Implementation of a project SWPPP would ensure compliance with CWA Section 402 and would protect the restored vegetation from damage due to erosion or sedimentation while it becomes established.

No new mitigation measures are proposed.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-2: Prevent introduction, spread, and establishment of invasive plant species

To avoid and minimize the introduction and spread of invasive nonnative plant species, the project proponent will implement the following BMPs.

- Construction vehicles and machinery will be cleaned prior to entering the construction area. Cleaning stations will be established at the perimeter of the construction area along all construction routes or immediately offsite.
- Vehicles will be washed only at approved areas. No washing of vehicles will occur at job sites.
- To discourage the introduction and establishment of invasive plant species, seed mixtures and straw used within natural vegetation will be either rice straw or weed-free straw, as allowed by state and federal regulation of stormwater runoff.

In addition, the project proponent will prepare and implement erosion and sediment control plans to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities (2020 Updated PEIR Mitigation Measure BIO-1b). Prior to initiating any construction activities that will result in temporary impacts on natural communities, a restoration and monitoring plan will be developed for temporarily affected habitats in each project area (PEIR Mitigation Measure BIO-5c). Restoration and monitoring plans will be submitted to the County and CDFW for approval. These plans will include methods for restoring soil conditions and revegetating disturbed areas, seed mixes, monitoring and maintenance schedules, adaptive management strategies, reporting requirements, and success criteria. Following completion of project construction, the project proponents will implement the revegetation plans to restore areas disturbed by project activities to a condition of equal or greater habitat function than occurred prior to the disturbance.

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

Within 30 days prior to any ground disturbance, a qualified biologist will prepare a Grassland Restoration Plan in coordination with CDFW and subject to CDFW approval, to ensure that temporarily disturbed annual grasslands and areas planned for the removal of permanent roads and turbine pad areas are restored to preproject conditions. The Grassland Restoration Plan will include but not be limited to the following measures.

- Gravel will be removed from areas proposed for grassland restoration.
- To the maximum extent feasible, topsoil will be salvaged from within onsite work areas prior to construction. Imported fill soils will be limited to weed-free topsoil similar in texture, chemical composition, and pH to soils found at the restoration site.
- Where appropriate, restoration areas will be seeded (hydroseeding is acceptable) to ensure erosion control. Seed mixes will be tailored to closely match that of reference site(s) within the program area and should include native or naturalized, noninvasive species sourced within the project area or from the nearest available location.

- Reclaimed roads will be restored in such a way as to permanently prevent vehicular travel.

The plan will include a requirement to monitor restoration areas annually (between March and October) for up to 3 years following the year of restoration. The restoration will be considered successful when the percent cover for restored areas is 70% absolute cover of the planted/seeded species compared to the percent absolute cover of nearby reference sites. No more than 5% relative cover of the vegetation in the restoration areas will consist of invasive plant species rated as "high" in California Invasive Plant Council's California Invasive Plant Inventory Database (http://www.cal-ipc.org). Remedial measures prescribed in the plan will include supplemental seeding, weed control, and other actions as determined necessary to achieve the long-term success criteria. Monitoring may be extended, if necessary, to achieve the success criteria or if drought conditions preclude restoration success. Other performance standards may also be required as they relate to special-status species habitat; these will be identified in coordination with CDFW and included in the plan. The project proponent will provide evidence that CDFW has reviewed and approved the Grassland Restoration Plan. Additionally, the project proponent will provide annual monitoring reports to the County by January 31 of each year, summarizing the monitoring results and any remedial measures implemented (if any are necessary) during the previous year.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

See discussion in Section 3.10, *Hydrology and Water Quality*, on page 3.10-9 and 3.10-10.

Impact BIO-3: Potential mortality or loss of habitat for vernal pool branchiopods and curved-foot hygrotus diving beetle (less than significant with mitigation)

Suitable habitats for vernal pool fairy shrimp and vernal pool tadpole shrimp (collectively referred to as vernal pool branchiopods) and curved-foot hygrotus diving beetle in the project site include two vernal pools, several small ephemeral ponds, and seasonal alkali wetlands. These habitats are located in lowland areas that will not be filled or directly disturbed by the installation of turbines and foundations. Ground-disturbing activities (i.e., excavation, grading, and stockpiling of soil) associated with constructing turbine foundations, building new and altering existing access roads, replacing culverts, installing a power collection system, and performing maintenance activities near or upslope of suitable habitat could result in the runoff of sediment, gasoline, oil, or other contaminants into suitable habitat, which could cause illness or mortality of vernal pool branchiopods and curved-foot hygrotus diving beetle or their food resources. ~~A spill~~

The use of horizontal directional drilling (HDD) methods during installation of the collection system to avoid sensitive habitats could result in an inadvertent release of drilling fluid containing bentonite near suitable habitat, which could also cause mortality of vernal pool branchiopods and curved-foot hygrotus diving beetle or contaminate habitat. As described in Chapter 2, *Project Description*, an Inadvertent Return Contingency Plan (IRCP) would be prepared and implemented to ensure that any inadvertent release of drilling fluids are contained and cleaned up immediately to avoid potential permanent impacts and minimize temporary impacts on aquatic habitats.

New facilities or improvements to existing roads that impede or alter the flow of stormwater across the project site once the project has been constructed could reduce the suitability of vernal pool branchiopod and curved-foot hygrotus diving beetle habitat by altering the hydroperiod of those aquatic features. Effects associated with potential sediment and chemical runoff during construction would be avoided and minimized through implementation of construction BMPs requiring installation of sediment control devices and implementation of a spill response plan. Implementation of mitigation measures from the PEIR would also avoid, minimize, and compensate for potential effects on vernal pool branchiopods and curved-foot hygrotus diving beetle.

Direct and indirect impacts on vernal pool brachiopods and curved-foot hygrotus diving beetle would be significant because the project could reduce the local populations of a federally listed or locally rare species. Implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and PEIR Mitigation Measures BIO-1e~~ and~~, BIO-3b, and WQ-1 would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they restrict the type and timing of activities in the vicinity of suitable habitat for vernal pool brachiopods and curved-foot hygrotus diving beetle and require construction to avoid and minimize indirect effects on suitable aquatic habitat, and would retain a biological monitor to ensure that these measures are properly implemented during construction. Also, any direct loss of habitat will be fully mitigated.

No new mitigation measures are proposed.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-3b: Implement measures to avoid, minimize, and mitigate impacts on vernal pool branchiopods and curved-foot hygrotus diving beetle

Where suitable habitat for listed vernal pool branchiopods and curved-foot hygrotus diving beetle are identified within 250 feet (or another distance as determined by a qualified biologist based on topography and other site conditions) of proposed work areas, the following measures will be implemented to ensure that the repowering projects do not have adverse impacts on listed vernal pool branchiopods or curved-foot hygrotus diving beetle. Additional conservation measures or conditions of approval may be required in applicable project permits (e.g., ESA incidental take permit).

- Avoid all direct impacts on sandstone rock outcrop vernal pools.
- Ground disturbance will be avoided from the first day of the first significant rain (1 inch or more) until June 1, or until pools remain dry for 72 hours and no significant rain is forecast on the day of such ground disturbance.
- If vernal pools, clay flats, alkaline pools, ephemeral stock tanks (or ponds), sandstone pools, or roadside ditches are present within 250 feet of the work area (or another appropriate distance as determined by a qualified biologist on the basis of topography and other site conditions), the biologist will stake and flag an exclusion zone prior to construction activities. The width of the exclusion zone will be based on site conditions and will be the maximum practicable distance that ensures protection of the feature from direct and indirect effects of the project. Exclusion zones will be established around features whether they are wet or dry at the time. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew).

- No herbicide will be applied within 100 feet of exclusion zones, except when applied to cut stumps or frilled stems or injected into stems. No broadcast applications will be allowed.
- Avoid modifying or changing the hydrology of aquatic habitats.
- Minimize the work area for stream crossings and conduct work during the dry season (June 1 through the first significant rain of the fall/winter).
- Install utility collection lines across perennial creeks by boring under the creek.

Where impacts cannot be avoided or minimized, compensatory mitigation will be undertaken in accordance with mitigation ratios and requirements developed under the EACCS. In the event that an incidental take permit is required, compensatory mitigation will be undertaken in accordance with the terms of the permit in consultation with USFWS.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact BIO-4: Potential disturbance or mortality of and loss of suitable habitat for valley elderberry longhorn beetle (less than significant with mitigation)

Riparian habitat supporting blue elderberry shrubs occurs along Patterson Run creek in the project site and provides suitable habitat for valley elderberry longhorn beetle. Thirty-six individual blue elderberry shrubs and shrub clusters are present in the project site (Figures 3.4-2a and 3.4-2b). All of the elderberry shrubs are located in the southern portion of the project site and most of them are found along Patterson Run Creek. The remaining elderberry shrubs are growing adjacent to unnamed intermittent streams and linear alkali wetlands.

Two of the onsite elderberry shrubs are located along proposed power collection system routes and could be directly affected by activities associated with installing power collection system infrastructure (Figures 3.4-2a and 3.4-2b). Potential construction-related impacts include breaking or trimming branches, disturbance of roots, or removal of shrubs. These impacts would be significant because the project could reduce the local populations of a federally listed species. Implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and BIO-4b, and PEIR Mitigation Measures BIO-1e and BIO-4a would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they would minimize the potential for take by requiring valley elderberry longhorn beetle surveys, requiring the establishment of appropriate buffers between active construction and suitable habitat, and by requiring a biological monitor to ensure that protection measures are properly implemented during construction. Also, any direct loss of habitat will be fully mitigated.

No new mitigation measures are proposed; however, updates were made to PEIR Mitigation Measure BIO-4b to address revised guidelines released by USFWS in 2017. These updates include changes to how elderberry shrubs are surveyed and the method for determining compensatory mitigation.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-4a: Implement measures to avoid or protect habitat for valley elderberry longhorn beetle

If it is determined through preconstruction surveys conducted pursuant to Mitigation Measure BIO-3a that elderberry shrubs are present within proposed work areas or within 100 feet of these areas, the following measures will be implemented to ensure that the proposed project does not have a significant impact on valley elderberry longhorn beetle.

- Avoid removal of elderberry shrubs.
- Elderberry shrubs/clusters within 100 feet of the construction area that will not be removed will be protected during construction. A qualified biologist (i.e., with elderberry/species experience) will mark the elderberry shrubs and clusters that will be protected during construction. Orange construction barrier fencing will be placed at the edge of the buffer areas. The buffer area distances will be proposed by the biologist and approved by USFWS (if required by project permits). No construction activities will be permitted within the buffer zone other than those activities necessary to erect the fencing. Signs will be posted every 50 feet along the perimeter of the buffer area fencing. The signs will contain the following information: *This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.*
- Buffer area fences around elderberry shrubs will be inspected weekly by a qualified biological monitor during ground-disturbing activities and monthly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor and the resident engineer. The biological monitor will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. Biological inspection reports will be provided to the project proponent and USFWS (if required by project permits).

2020 Updated PEIR Mitigation Measure BIO-4b: Compensate for direct and indirect effects on valley elderberry longhorn beetle

If elderberry shrubs cannot be avoided and protected as outlined in PEIR Mitigation Measure BIO-4a, the project proponent will obtain an incidental take permit from USFWS and compensate for direct impacts on any elderberry shrubs (i.e., removed or trimmed). Surveys of elderberry shrubs to be transplanted will be conducted by a qualified biologist prior to transplantation or trimming. Surveys will be conducted in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife Service 2017) and will document the following: (1) presence/absence of exit holes; (2) evaluation of riparian/non-riparian habitat; and (3) suitability of shrubs to support valley elderberry longhorn beetle. Survey results and an analysis of the number of mitigation units that would be required based on the survey results will be submitted to USFWS in a biological assessment or an HCP. After receipt of an incidental take permit and before construction begins, the project proponent will compensate for direct effects on elderberry shrubs by transplanting shrubs that cannot be avoided to a USFWS-approved conservation area and planting additional elderberry shrubs and associated riparian habitat at a USFWS-approved conservation area. Any elderberry shrub containing stem(s) measuring 1 inch or more in diameter at ground level that is deemed suitable habitat and is adversely affected (i.e., trimmed, transplanted, or destroyed) will be mitigated by planting replacement habitat (i.e., elderberry shrub seedlings and associate plant species), in the conservation area, at a ratio ranging from 1:1 to 3:1 (mitigation unit to affected habitat). The number of mitigation units (1 unit = 0.041 acre) to be planted as replacement habitat are determined by either the acreage of habitat (elderberry shrub and associated riparian) removed or number of shrubs trimmed, as well as the presence or absence of exit holes and whether the shrub lies in a riparian or non-riparian habitat. Stock of either seedlings or cuttings would be obtained from local sources.

At the discretion of USFWS, shrubs that are unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible, mitigation ratios could be increased to offset the additional habitat loss.

The relocation of the elderberry shrubs will be conducted according to USFWS-approved procedures outlined in the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife Service 2017), or the most current USFWS guidance. If possible, elderberry shrubs within the project construction area that cannot be avoided will be transplanted during the plant's dormant phase (November through the first 2 weeks of February). A qualified biological monitor will remain onsite while the shrubs are being transplanted.

Evidence of valley elderberry longhorn beetle occurrence in the conservation area, the condition of the elderberry shrubs in the conservation area, and the general condition of the conservation area itself will be monitored. Monitoring protocols and reporting timelines will be determined as part of the endangered species coordination/consultation with USFWS for the project. The project proponent will be responsible for funding and providing monitoring reports to USFWS in each of the years in which a monitoring report is required. As specified in the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife Service 2017), the report will include information on presence of exit holes, evaluation of success criteria, summary of weed control and site protection, assessment of threats to valley elderberry longhorn beetle on the site, and photo documentation of current habitat condition. Mitigation credits may be purchased at a USFWS-approved mitigation bank in lieu of the above monitoring requirements, as determined during coordination/consultation with USFWS for the project.

Impact BIO-5: Potential disturbance or mortality of and loss of suitable habitat for California tiger salamander, western spadefoot toad, California red-legged frog, and foothill yellow-legged frog (less than significant with mitigation)

Based on the presence of suitable aquatic and upland habitat for California tiger salamander, western spadefoot toad, and California red-legged frog at the project site and known populations at and adjacent to the project site, there is a potential for these species to be affected by project activities. The project site does not provide suitable habitat for foothill-yellow legged frog as there are no rocky, woodland streams that run through the project site. The project is not expected to have impacts on foothill yellow-legged frogs.

One pond that provides suitable aquatic habitat for California tiger salamander, western spadefoot, and California red-legged frog would be permanently (0.02 acre) and temporarily (0.10 acre) affected by road widening (Table 3.4-6). Other suitable aquatic habitats for California tiger salamander and western spadefoot (ponds) and California red-legged frog (ponds, freshwater marsh~~, riparian~~, scrub-shrub wetland, and intermittent stream) are located in lowland areas that would not be filled or directly disturbed by the installation of turbines and foundations. A small amount of riparian habitat vegetation (<0.001 acre [<40 square feet]) that could provide potential foraging or refuge habitat for California red-legged frog would be temporarily disturbed during installation of power collection lines across Patterson Run (Table 3.4-6).

Ground-disturbing activities (i.e., excavation, grading, and stockpiling of soil) associated with constructing turbine foundations, building new and altering existing access roads, replacing culverts, installing the power collection system, and performing maintenance activities near or upslope of suitable habitat could result in the runoff of sediment, gasoline, oil, or other contaminants into suitable habitat, which could cause illness or mortality of California tiger salamander, western spadefoot, and California red-legged frog or their food resources. ~~A spill of~~The use of HDD methods to avoid sensitive habitats could result in an inadvertent release drilling fluid containing bentonite near suitable habitat could also cause mortality of California tiger salamander, western spadefoot, and California red-legged frog or contaminate habitat. As described in Chapter 2, *Project Description*, an IRCP would be prepared and implemented to ensure that any inadvertent release of drilling fluids are contained and cleaned up immediately to avoid potential permanent impacts and minimize temporary impacts on aquatic habitats.

Ground-disturbing activities associated with constructing new access roads, widening existing access roads, installing the power collection system, and performing maintenance activities would affect small areas of intermittent stream and alkali wetland that provide aquatic nonbreeding and dispersal habitat for California red-legged frog. While work in or near suitable aquatic nonbreeding and dispersal habitat could result in injury or mortality of individual California red-legged frog, the majority of individuals would be at suitable breeding ponds where there would be no disturbance.

Construction of turbines and foundations, access roads, the temporary construction area, meteorological towers, and the power collection system would be located within suitable California tiger salamander, western spadefoot, and California red-legged frog upland habitat (nonnative annual grassland). Construction of these facilities, as well as maintenance activities, would result in permanent and temporary losses of upland habitat. Project impacts on upland grassland habitat associated with construction and maintenance activities are summarized in Table 3.4-7.

California tiger salamanders, western spadefoot toads, and California red-legged frogs in active work areas could be killed or injured by being crushed by equipment, entrapped in open trenches or other project facilities or entombed in burrows that are covered or filled. California tiger salamander, western spadefoot, and California red-legged frog could be run over by vehicles traveling on the project site or to the project site on Patterson Pass Road during construction and maintenance activities. The potential for such injury or mortality would increase at night and during periods of wet weather or high humidity. The potential for increased injury or mortality from being run over would be higher during construction when up to 100 workers could be traveling to and from the construction area.

New facilities or improvements to existing roads that impede or alter the flow of stormwater across the project site once the project has been constructed could reduce the suitability of California tiger salamander, western spadefoot, and California red-legged frog aquatic habitats by altering the hydroperiod of those aquatic features. Because of the limited extent of impacts in relation to the size of the watershed, the project is not expected to significantly increase the amount of impervious surface or to alter local hydrology. Soil surfaces left unvegetated have the potential to lead to sedimentation of suitable aquatic breeding, foraging, and dispersal habitats. Project maintenance has the potential to result in degradation of water quality in aquatic habitats from runoff of petroleum-based products associated with equipment and vehicles used during maintenance activities.

Lighting around the new substation would introduce light at the project site. Light can disrupt nighttime foraging and migration activities of California tiger salamander, western spadefoot, and California red-legged frog. Because no ponds are located within 0.75 mile of the new substation and new lighting would be restricted to this area, would operate with motion sensors, and be directed downward, the effect of new lighting on these amphibians is expected to be minor or negligible.

Direct and indirect impacts on California tiger salamander, California red-legged frog, and western spadefoot would be significant because the project could reduce the local populations of state- and federally listed and locally rare species. Implementation of 2020 Updated PEIR Mitigation Measures BIO-1b and BIO-5a, and PEIR Mitigation Measures BIO-1e, BIO-5b, ~~and~~ BIO-5c, and WQ-1 would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they would minimize the potential for take by: restricting the timing of activities to avoid periods of increased above ground movements; requiring preconstruction surveys to clear areas of special-status amphibians before the start of construction; precluding animals from high risk areas by fencing active construction areas and covering open holes or trenches; allowing for animals to be relocated if found within the construction area; providing protection of adjacent aquatic breeding habitat by implementing construction BMPs to reduce indirect water quality impacts; restoring temporarily disturbed upland habitat, and ensuring proper implementation of all protection measures by requiring an onsite biological monitor during ground-disturbing activities. Also, direct loss of habitat will be fully mitigated.

No new mitigation measures are proposed; however, PEIR Mitigation Measure BIO-5a has been updated to provide clarification on when and how barrier fencing should be installed and on methods for conducting amphibian preconstruction surveys. This update will help ensure that avoidance and minimization measures are feasible and provide effective species detection and protection.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

2020 Updated PEIR Mitigation Measure BIO-5a: Implement best management practices to avoid and minimize effects on special-status amphibians

The project proponent will ensure that BMPs and other appropriate measures, in accordance with measures developed for the EACCS, be incorporated into the appropriate design and construction documents. *Implementation of some of these measures will require that the project proponent obtain incidental take permits from USFWS (California red-legged frog and California tiger salamander) and from CDFW (California tiger salamander only) before construction begins.* Additional conservation measures or conditions of approval may be required in applicable project permits (e.g., ESA or CESA incidental take authorization). The applicant will comply with the State Water Board NPDES construction general requirements for stormwater.

- Ground-disturbing activities will be limited to dry weather between April 15 and October 31. No ground-disturbing work will occur during wet weather. Wet weather is defined as when there has been 0.25 inch of rain in a 24-hour period. Ground disturbing activities halted due to wet weather may resume when precipitation ceases and the National Weather Service 72-hour weather forecast indicates a 30% or less chance of precipitation. No ground-disturbing work will occur during a dry-out period of 48 hours after the above-referenced wet weather.

- Where applicable, barrier fencing will be installed around the worksite to prevent amphibians from entering the work area. Barrier fencing will be removed within 72 hours of completion of work. The need and location of barrier fencing will be identified by a qualified biologist in cooperation with the County and/or any applicable resource agencies with the purpose of protecting dispersing special-status amphibians.
- Before construction begins, a qualified biologist will locate appropriate relocation areas and prepare a relocation plan for special-status amphibians that may need to be moved during construction. The proponent will submit this plan to USFWS and CDFW for review a minimum of 2 weeks prior to the start of construction.
- A qualified biologist will conduct preconstruction surveys (i.e., visual surveys of the ground surface and areas within burrows visible from the surface) immediately prior to ground-disturbing activities (including equipment staging, vegetation removal, grading). The biologist will survey the work area and all suitable habitats within 300 feet of the work area. If individuals (including adults, juveniles, larvae, or eggs) are found, work will not begin until USFWS and/or CDFW is contacted to determine if moving these life-stages is appropriate. If relocation is deemed necessary, it will be conducted in accordance with the relocation plan. Incidental take permits are required for relocation of California tiger salamander (USFWS and CDFW) and California red-legged frog (USFWS). Relocation of western spadefoot toad requires a letter of permission or permit from CDFW authorizing this activity.
- No monofilament plastic will be used for erosion control.
- All project activity will terminate 30 minutes before sunset and will not resume until 30 minutes after sunrise during the migration/active season from November 1 to June 15. Sunrise and sunset times are established by the U.S. Naval Observatory Astronomical Applications Department for the geographic area where the project is located.
- Vehicles will not exceed a speed limit of 15 mph on unpaved roads within natural land cover types, or during offroad travel.
- Trenches or holes more than 6 inches deep will be provided with one or more escape ramps constructed of earth fill or wooden planks and will be inspected by a qualified biologist prior to being filled. Any such features that are left open overnight will be searched each day prior to construction activities to ensure no covered species are trapped. Work will not continue until trapped animals have moved out of open trenches.
- Work crews or the onsite biological monitor will inspect open trenches, pits, and under construction equipment and material left onsite in the morning and evening to look for amphibians that may have become trapped or are seeking refuge.
- If special-status amphibians are found in the work area during construction and cannot or do not move offsite on their own, a qualified biologist who is USFWS and/or CDFW-approved under a biological opinion and/or incidental take permit for the specific project, will trap and move special-status amphibians in accordance with the relocation plan. Relocation of western spadefoot toad requires a separate letter of permission or permit from CDFW authorizing this activity.

PEIR Mitigation Measure BIO-5b: Compensate for loss of habitat for special-status amphibians

Where impacts on aquatic and upland habitat for special-status amphibians cannot be avoided or minimized, compensatory mitigation will be undertaken in accordance with mitigation ratios and requirements developed under the EACCS. In the event that take authorization is required, compensatory mitigation will be undertaken in accordance with the terms of the authorization in consultation with USFWS and/or CDFW.

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact BIO-6: Potential disturbance or mortality of and loss of suitable habitat for western pond turtle (less than significant with mitigation)

Suitable aquatic habitat (perennial ponds) for western pond turtle is located in lowland areas that would not be filled or directly disturbed by the installation of turbines and foundations. Ground-disturbing activities (i.e., excavation, grading, and stockpiling of soil) associated with constructing turbine foundations, new access roads, widening existing access roads, installing the power collection system, and performing maintenance activities near or upslope of suitable aquatic habitat could result in the runoff of sediment, gasoline, oil, or other contaminants into suitable aquatic habitat, which could cause illness or mortality of western pond turtle or its food resources. A spill of drilling fluid containing bentonite near suitable habitat could also cause mortality of western pond turtle or contaminate habitat. Widening of two access roads would be conducted near one pond that provide suitable habitat for western pond turtle. Disturbance of nonnative annual grassland near this pond would result in temporary and permanent impacts on suitable western pond turtle upland habitat and potential injury or mortality of individuals. Nests containing pond turtle eggs could be crushed or individuals could be injured or killed during movement of equipment or grading activities. Potential effects on western pond turtle would be avoided, minimized, and compensated for through the implementation of construction BMPs and mitigation measures from the PEIR.

Direct and indirect impacts on western pond turtle would be significant because the proposed project could diminish the local population of western pond turtles and lower reproductive potential, contributing to the further decline of the species. Implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and PEIR Mitigation Measures BIO-1e and BIO-6 would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they include surveys to identify if pond turtles are present in aquatic habitats in the construction work area so that a biologist can be present during construction to ensure that pond turtles are not directly impacted by construction activities. Also, construction BMPs would be implemented to minimize indirect effects to suitable aquatic habitat.

No new mitigation measures are proposed.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-6: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed

If it is determined through preconstruction surveys conducted pursuant to PEIR Mitigation Measure BIO-3a that suitable aquatic or upland habitat for western pond turtle is present within proposed work areas, the following measures, consistent with measures developed for the EACCS, will be implemented to ensure that the proposed project does not have a significant impact on western pond turtle.

- One week before and within 24 hours of beginning work in suitable aquatic habitat, a qualified biologist (one who is familiar with different species of turtles) will conduct surveys for western pond turtle. The surveys should 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 12 p.m. during spring and summer). Prior to conducting the surveys, the biologist should 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 should consist of a minimum 15-minute observation period for each area where turtles could be observed.
- If western pond turtles are observed during either survey, a biological monitor will be present during construction activities in the aquatic habitat where the turtle was observed. The biological monitor also will be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat and will periodically inspect these areas for nests and turtles.
- If one or more western pond turtles are found in the work area during construction and cannot or do not move offsite on their own, a qualified biologist will remove and relocate the turtle to appropriate aquatic habitat outside and away from the construction area. Relocation of western pond turtle requires a letter from CDFW authorizing this activity.

Impact BIO-7: Potential disturbance or mortality of and loss of suitable habitat for Blainville's horned lizard, California glossy snake, Alameda whipsnake, and San Joaquin coachwhip (less than significant with mitigation)

Nonnative annual grassland and shrub/scrub in the project site provide suitable habitat for Blainville's horned lizard, California glossy snake, Alameda whipsnake, and San Joaquin coachwhip. Ground-disturbing activities (i.e., excavation, grading, and stockpiling of soil) that occur in these habitats could result in injury or mortality of these species if they are present in active work areas. Individuals could be run over by vehicles or equipment during construction and maintenance activities, or be entrapped in pits or trenches if these features are left open overnight. Individuals seeking shade or refuge under vehicles or equipment could be crushed when vehicles or equipment are moved. Construction activities would also permanently and temporarily disturb suitable habitat. Project impacts on upland grassland habitat associated with construction and maintenance activities are summarized in Table 3.4-7.

Direct impacts on Blainville's horned lizard, California glossy snake, Alameda whipsnake, or San Joaquin coachwhip would be significant because the proposed project could diminish the local population of these species and lower reproductive potential, contributing to the further decline of the species. Implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and BIO-7a, and PEIR

Mitigation Measures BIO-1e, BIO-5c, and BIO-7b would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they would minimize the potential for take by: requiring preconstruction surveys to clear areas of special-status reptiles before the start of construction; minimizing ground disturbance and conducting vegetation removal in a manner to allow special-status reptiles time to move out of harm's way; precluding animals from high risk areas by fencing active construction areas where applicable; allowing for animals to be relocated if found within the construction area; and ensuring proper implementation of all protection measures by requiring an onsite biological monitor during ground-disturbing activities. Also, measures to restore temporarily disturbed annual grassland will reduce the amount of habitat modification from project activities.

No new mitigation measures are proposed; however, PEIR Mitigation Measure BIO-7a has been updated to include California glossy snake, which is known to occur at the project site and should be considered during surveys. This update will help ensure avoidance and minimization of impacts to this species of special concern.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

2020 Updated PEIR Mitigation Measure BIO-7a: Implement best management practices to avoid and minimize effects on special-status reptiles

Where suitable habitat for Blainville's horned lizard, California glossy snake, Alameda whipsnake, or San Joaquin coachwhip is identified in proposed work areas, all project proponents will ensure that BMPs and other appropriate measures, in accordance with measures developed for the EACCS, be incorporated into the appropriate design and construction documents. Implementation of some of these measures may require that the project proponent obtain incidental take permits from USFWS and CDFW (Alameda whipsnake) before construction begins. Additional conservation measures or conditions of approval may be required in applicable project permits (i.e., ESA incidental take permit).

- A qualified biologist will conduct preconstruction surveys immediately prior to ground-disturbing activities (e.g., equipment staging, vegetation removal, grading) associated with the program. If any Blainville's horned lizards, California glossy snake, Alameda whipsnakes, or San Joaquin coachwhips are found, work will not begin until they are moved out of the work area to a USFWS- and/ or CDFW-approved relocation site. Incidental take permits from USFWS and CDFW are required for relocation of Alameda whipsnake. Relocation of Blainville's horned lizard, California glossy snake, and San Joaquin coachwhip requires a letter from CDFW authorizing this activity.
- No monofilament plastic will be used for erosion control.
- Where applicable, barrier fencing will be used to exclude Blainville's horned lizard, California glossy snake, Alameda whipsnake, and San Joaquin coachwhip. Barrier fencing will be removed within 72 hours of completion of work.

- Work crews or an onsite biological monitor will inspect open trenches and pits and under construction equipment and materials left onsite for special-status reptiles each morning and evening during construction.
- Ground disturbance in suitable habitat will be minimized.
- Vegetation within the proposed work area will be removed prior to grading. Prior to clearing and grubbing operations, a qualified biologist will clearly mark vegetation within the work area that will be avoided. Vegetation outside the work area will not be removed. Where possible hand tools (e.g., trimmer, chain saw) will be used to trim or remove vegetation. All vegetation removal will be monitored by the qualified biologist to minimize impacts on special-status reptiles.
- If special-status reptiles are found in the work area during construction and cannot or do not move offsite on their own, a qualified biologist who is USFWS- and/or CDFW-approved under an incidental take permit for the specific project will trap and move the animal(s) to a USFWS and/or CDFW approved relocation area. Incidental take permits from USFWS and CDFW are required for relocation of Alameda whipsnake. Relocation of Blainville's horned lizard, California glossy snake, and San Joaquin coachwhip requires a letter or permit from CDFW authorizing this activity.

PEIR Mitigation Measure BIO-7b: Compensate for loss of habitat for special-status reptiles

Where impacts on habitat for special-status reptiles cannot be avoided or minimized, compensatory mitigation will be undertaken in accordance with mitigation ratios and requirements developed under the EACCS. In the event that incidental take permits are required for Alameda whipsnake, compensatory mitigation will be undertaken in accordance with the terms of permits in consultation with USFWS and CDFW.

Impact BIO-8a: Potential construction-related disturbance or mortality of special-status and ~~non–special-status non-raptor migratory birds~~<u>other raptors</u> (less than significant with mitigation)

Several special-status, non-raptor migratory bird species could nest on the project site including tricolored blackbird, loggerhead shrike, and grasshopper sparrow. Avian use surveys (ICF 2020b) recorded one tricolored blackbird observation on the project site, and field surveys conducted during the summer of 2020 (ICF 2020a) identified a flock of tricolored blackbirds near a wetland area in the southern portion of the project site (Figure 3.4-2b). No confirmed nest colonies have been previously found on the project site (ICF 2020b). Numerous observations of loggerhead shrike were also made during the avian use surveys (ICF 2020b) and the species is likely to nest in trees or shrubs on the project site. Although suitable nesting habitat is present throughout the project site for grasshopper sparrow, this species was not detected during avian use surveys or during various biological surveys conducted on the project site (ICF 2020a).

Tricolored blackbird could nest in freshwater marsh<u> or alkali wetland habitats</u> within the project site that support large areas of dense vegetation such as cattails, tules, willows, blackberries, thistles, or nettles. Loggerhead shrikes, grasshopper sparrow, and other tree, shrub, and ground-nesting migratory birds could nest in vegetation throughout the project site.

Project impacts on upland grassland<u> and alkali wetland</u> habitat associated with construction and maintenance activities are summarized in Table 3.4-7. There would be no permanent or temporary losses of freshwater marsh as a result of the project. A small amount of riparian habitat vegetation would be temporarily disturbed during installation of power collection lines across Patterson Run (Table 3.4-6); however, no trees within the riparian habitat or other groups of trees at the project site that provide nesting habitat for migratory birds would be removed during construction.

Construction of the project would avoid removal of large trees or disturbance of existing electrical towers that could provide nesting habitat for raptors. However, if active nests are present in proximity to construction, they could be disturbed by noise and visual disturbances. ~~Destruction or~~

The project would result in the permanent removal and temporary disturbance of vegetated habitats that provide potential nesting habitat for special-status and other raptors (Table 3.4-6). Habitat disturbance caused by construction of the project during the breeding season could destroy or disturb active bird or raptor nests, which could result in the incidental loss of fertile eggs or nestlings. Noise and visual disturbance from construction near active nests in trees, shrubs, on rock outcrops, transmission towers, or other structures could result in nest abandonment, disruption of feeding patterns, or forced fledging of young. Loss of migratory bird eggs, young, or adults that results from construction activities would violate the MBTA and provisions of the California Fish and Game Code. Potential effects would be avoided or minimized through the implementation of mitigation measures in the PEIR as well as by 2020 Updated PEIR Mitigation Measures.

Implementation of 2020 Updated PEIR Mitigation Measures BIO-1b and BIO-8a and PEIR Mitigation Measures BIO-1e and BIO-5c would reduce project impacts on tricolored blackbird, loggerhead shrike, grasshopper sparrow, and non-special-status tree-, shrub-nesting migratory birds to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they include surveys to identify active bird nests within species-specific buffer zones from active construction and establishment of no-activity zones to protect active nests until young have fledged.

No new mitigation measures are proposed; however, PEIR Mitigation Measure BIO-8a has been updated to note specific habitat requirements for nesting tricolored blackbirds, which should be considered during surveys. This update will help ensure avoidance of impacts on nesting colonies during construction, if any are present.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential construction-related impacts on special-status and non–special-status nesting birds and raptors

Where suitable habitat is present for raptors within 1 mile (within 2 miles for golden eagles) and for tree/shrub- and ground-nesting migratory birds (non-raptors) within 50 feet (1,300 feet for tricolored blackbird) of proposed work areas, the following measures will be implemented to ensure that construction of the proposed project does not have a significant impact on nesting special-status and non–special-status birds.

- Remove suitable nesting habitat (shrubs and trees) during the non-breeding season (September 1–January 31) for nesting birds.
- To the extent feasible, avoid construction activities in or near suitable or occupied nesting habitat during the breeding season of birds (generally February 1–August 31).
- If construction activities (including vegetation removal, clearing, and grading) will occur during the nesting season for migratory birds, a qualified biologist will conduct a total of three preconstruction nesting bird and raptor surveys ~~within 7 days prior to construction activities.~~. The ~~construction~~ construction area and a 1-mile buffer will be surveyed for tree-nesting raptors (except for golden eagles as addressed below), a 500-foot buffer will be surveyed for northern harrier, and a 1,300-foot buffer will be surveyed for tricolored blackbird if potential tricolored blackbird nesting substrates are present (i.e., flooded, thorny, or spiny vegetation such as cattails, tules, willows, ~~blackberries, thistles, or nettles), and a 50-foot buffer will be surveyed for all other bird species.~~ blackberries, thistles, or nettles), and a 50-foot buffer will be surveyed for all other bird species. The first survey will be conducted within the areas described above between 30-60 days prior to the start of construction to identify potential nesting habitat that could be used by special-status and non-special-status birds and raptors within the survey area and to document any nesting behavior or activity. A second survey will be conducted no less than 14 days prior to starting construction to verify current occupancy status of nesting birds and raptors. A final survey will be conducted immediately prior to initiating ground-disturbing activities within disturbance areas and appropriate species buffers. The final surveys may be phased on the project site depending on which areas/components of the project would begin ground-disturbing activities, so that they are conducted immediately prior to ground disturbing activities within a specific area.
- Surveys to locate eagle nests within 2 miles of construction will be conducted during the breeding season prior to construction. A 1-mile no-disturbance buffer will be implemented for construction activities to protect nesting eagles from disturbance. Through coordination with USFWS, the no-disturbance buffer may be reduced to 0.5 mile if construction activities are not within line-of-sight of the nest.
- If an active nest (other than golden eagle) is identified near a proposed work area and work cannot be conducted outside the nesting season (February 1–August 31), a no-activity zone will be established around the nest by a qualified biologist in coordination with USFWS and/or CDFW. 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 type and extent of the proposed activity, the duration and timing of the activity, the sensitivity and habituation of the species, and the dissimilarity of the proposed activity to background activities. The no-activity zone will be large enough to avoid nest abandonment and will be between 50 feet and 1 mile from the nest, or as otherwise required by USFWS and/or CDFW.

Impact BIO-8b: Potential construction-related disturbance or mortality of special-status and non–special-status raptors (less than significant with mitigation)

White-tailed kite and Swainson's hawk could nest in trees or electrical transmission towers at the project site. Golden eagles could nest on large rock outcrops, in transmission towers, or large, isolated trees at the project site, but could also nest in suboptimal habitat such as small trees and on the ground. A Swainson's hawk nest was identified on the project site during nesting raptor surveys conducted during 2020 field surveys (ICF 2020a). An active golden eagle nest was detected during USGS surveys conducted in 2020 (ICF 2020b) and there is a high likelihood that golden eagles would attempt to nest on the project site in subsequent years. While no white-tailed kites were detected during project surveys, white-tailed kite could also nest on the project site.

Several raptor species could also nest in ground vegetation or in underground. Northern harrier and short-eared owl could nest in areas of tall, dense vegetation in nonnative annual grassland and freshwater marsh habitats at the project site. Northern harriers were observed on the project site during biological field surveys; however, short-eared owls were not (ICF 2020a). Burrowing owls could nest in underground burrows within grasslands throughout the project site. Burrowing owls could also use existing culverts as refuge during the breeding and non-breeding seasons. Several burrowing owl sightings were made throughout the project site during the 2019 and 2020 project surveys (ICF 2020a, 2020b). Burrowing owl are expected to be nesting on the project site and are known to also occupy adjacent preserve lands.

Project impacts on upland grassland habitat associated with construction and maintenance activities are summarized in Table 3.4-7. There would be no permanent or temporary losses of freshwater marsh as a result of the project. A small amount of riparian habitat vegetation (<0.001 acre [<40 square feet]) would be temporarily disturbed during installation of power collection lines across Patterson Run (Table 3.4-6); however, no trees within the riparian habitat or other groups of trees at the project site that provide nesting habitat for Swainson's hawk and white-tailed kite would be removed during construction.

Permanent and temporary removal of grasslands could result in the loss of potential habitat and disturbance of ground nesting raptors such as northern harrier. Construction of the project would avoid removal of large trees or disturbance of existing electrical towers that could provide nesting habitat for tree/structure-nesting raptors. However, if active nests are present in proximity to construction, they could be disturbed by noise and visual disturbances. Destruction or disturbance of active nests could result in the incidental loss of fertile eggs or nestlings. Noise and visual disturbance from construction near active nests in trees, shrubs, on rock outcrops, transmission towers, or other structures could result in nest abandonment, disruption of feeding patterns, or forced fledging of young. Loss of migratory bird eggs, young, or adults that results from construction activities would violate the MBTA and provisions of the California Fish and Game Code. Potential effects would be avoided or minimized through the implementation of mitigation measures in the PEIR, and by 2020 Updated PEIR Mitigation Measures.

Implementation of 2020 Updated PEIR Mitigation Measures BIO-1b~~ and~~, BIO-8a, and BIO-8b and PEIR Mitigation Measures BIO-1e, and BIO-5c~~, and BIO-8b~~ would reduce project construction-related impacts on special-status raptors such as~~,~~ white-tailed kite, Swainson's hawk, golden eagle, northern harrier, short-eared owl, western burrowing owl, and other non-special-status raptors to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they include surveys to identify active raptor nests within species-specific buffer zones from active construction and establishment of no-activity zones to protect active nests until young have fledged.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential impacts on special-status and non–special-status nesting birds and raptors.

2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl

Where suitable habitat for western burrowing owl is in or within 500 feet of proposed work areas, the following measures will be implemented to avoid or minimize potential adverse impacts on burrowing owls.

- To the maximum extent feasible (e.g., where the construction footprint can be modified), construction activities within 500 feet of active burrowing owl burrows will be avoided during the nesting season (February 1–August 31).
- A qualified biologist will conduct a total of three preconstruction take avoidance surveys for burrowing owl. The first pre-construction survey will be conducted between 30-60 days prior to the start of construction to identify potential nest sites and to determine current occupancy status. A second survey will be conducted no less than 14 days prior to ~~and~~ starting construction to verify current occupancy status. A final survey will be conducted within 24 hours of initiating ground-disturbing activities~~.~~, or phased as discussed above (2020 Updated PEIR Mitigation Measure BIO-8a). The survey area will encompass the work area and a 500-foot buffer around this area.
- If an active burrow is identified near a proposed work area and work cannot be conducted outside the nesting season (February 1–August 31), a no-activity zone will be established by a qualified biologist in coordination with CDFW. The no-activity zone will be large enough to avoid nest abandonment and will extend a minimum of 250 feet around the burrow.
- If burrowing owls are present at the site during the non-breeding season (September 1–January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow.
- If the designated no-activity zone for either breeding or non-breeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and, in coordination with CDFW, recommend a smaller buffer (if possible) and/or other measure that still minimizes disturbance of the owls (while allowing reproductive success during the breeding season). The site-specific buffer (and/or other measure) will consider the type and extent of the proposed activity occurring near the occupied burrow, the duration and timing of the activity, the sensitivity and habituation of the owls, and the dissimilarity of the proposed activity to background activities.
- If burrowing owls are present in the direct disturbance area and cannot be avoided during the non-breeding season (generally September 1 through January 31), burrowing owls may

be excluded from burrows through the installation of one-way doors at burrow entrances. A burrowing owl exclusion plan, prepared by the project proponent, must be approved by CDFW prior to exclusion of owls. One-way doors (e.g., modified dryer vents or other CDFW approved method), which will be left in place for a minimum of 1 week and monitored daily to ensure that the owl(s) have left the burrow(s). Excavation of the burrow will be conducted using hand tools. During excavation of the burrow, a section of flexible plastic pipe (at least 3 inches in diameter) will be inserted into the burrow tunnel to maintain an escape route for any animals that may be inside the burrow. Owls will be excluded from their burrows as a last resort and only if other avoidance and minimization measures cannot be implemented.

- Avoid destruction of unoccupied burrows outside the work area and place visible markers near burrows to ensure that they are not collapsed.
- Conduct ongoing surveillance of the project site for burrowing owls during project activities. If additional owls are observed using burrows within 500 feet of construction, the onsite biological monitor will determine, in coordination with CDFW, if the owl(s) are or would be affected by construction activities and if additional exclusion zones are required.

Impact BIO-9a: Permanent and temporary loss of occupied habitat for western burrowing owl (less than significant with mitigation)

Burrowing owls are likely to be year-round residents within grassland habitats at the project site. Project impacts on upland grassland habitat associated with construction and maintenance activities are summarized in Table 3.4-7. The location of burrowing owl observations made during 2019 and 2020 field surveys are depicted on Figure 3.4-2a and 3.4-2b. Burrowing owls are also known to occur on the adjacent Two Sisters Habitat Preserve (in the center of the project site) as well as other adjacent habitat preserves (Figure 3.4-1). Active burrowing owl burrows or refuge sites (i.e., culverts) could be permanently or temporarily lost from construction activities: excavation, grading, and culvert replacement. CDFW has determined on previous projects that compensation is required for permanent loss of occupied burrowing owl habitat (i.e., where burrowing owls have been documented to occupy burrows in the preceding 3 years).

Permanent and temporary loss of grassland habitat would also reduce the available foraging habitat for burrowing owls. Grassland habitat impacts are summarized in Table 3.4-7. Overall, the project would permanently remove approximately 26 acres of annual grassland, which is less than 1% of the approximately 4,370 acres of annual grassland of the entire project site. The loss of less than 1% of available foraging habitat at the project site is not expected to substantially reduce the availability of foraging habitat in the project region for burrowing owls. Up to 264 acres of annual grassland would be temporarily disturbed during project construction~~; however~~, accounting for 6 % of the available grassland habitat in the project area. While there would be a small reduction in breeding and foraging habitat during the construction season, this loss is not expected to substantially reduce reproductive potential of burrowing owls in the project area, would be short-term (7 months) and , implementation of PEIR Mitigation Measure BIO-5c would restore temporarily disturbed grasslands to pre-project conditions. Therefore, the temporary loss of burrowing owl habitat during project construction would be less than significant.

Permanent loss of occupied burrowing owl habitat could affect the local population and would be a significant impact; however, implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and BIO 8-b and PEIR Mitigation Measures BIO-1e, BIO-5c, ~~BIO-8b,~~ and BIO-9 would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they include surveys to identify occupied burrowing owl habitat within the construction work area and 500-foot buffer, establishment of no-activity zones, to protect occupied areas, restoration of annual grassland habitat, and compensation of permanent loss of grassland and occupied burrowing owl habitat.

No new mitigation measures are proposed.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl

PEIR Mitigation Measure BIO-9: Compensate for the permanent loss of occupied habitat for western burrowing owl

If construction activities would result in the removal of occupied burrowing owl habitat (determined during preconstruction surveys described in 2020 Updated PEIR Mitigation Measure BIO-8b), this habitat loss will be mitigated by permanently protecting mitigation land through a conservation easement or by implementing alternative mitigation determined through consultation with CDFW as described in its *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012:11–13). The project proponent will work with the CDFW to develop the compensation plan, which will be subject to County review and approval.

Impact BIO-9b: Permanent and temporary loss of foraging habitat for tricolored blackbird and other special-status and non-special-status birds (less than significant with mitigation)

Permanent and temporary loss of grassland habitat would also reduce the available foraging habitat for tricolored blackbird and other special-status and non–special-status birds. Field surveys conducted during the summer of 2020 within the project site (ICF 2020a) identified a flock of tricolored blackbirds foraging near a wetland area in the southern portion of the project site (Figure 3.4-2b).

Grassland habitat impacts are summarized in Table 3.4-7. Overall, the project would permanently remove approximately 26 acres of annual grassland, which is less than 1% of the approximately 4,370 acres of annual grassland of the entire project site. The loss of less than 1% of available foraging habitat at the project site is not expected to substantially reduce the availability of foraging habitat in the project region and will not adversely affect special-status and non-special-status bird species. Up to 264 acres of annual grassland would be temporarily disturbed during project construction; however, implementation of PEIR Mitigation Measure BIO-5c would restore temporarily disturbed grasslands to pre-project conditions.

No new mitigation measures are proposed.

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

Impact BIO-10: Potential injury or mortality of and loss of habitat for San Joaquin kit fox and American badger (less than significant with mitigation)

Construction of turbine foundations, access roads, the temporary construction area, meteorological towers, and the power collection system would be located within suitable denning, foraging, and dispersal habitat (nonnative annual grassland) for San Joaquin kit fox and American badger. Nonnative annual grassland in the project site contain numerous burrows that provide suitable denning habitat for these species. Construction of project facilities, as well as maintenance activities, would result in permanent and temporary losses of habitat. Impacts on nonnative annual grassland from construction and maintenance activities are summarized in Table 3.4-7.

San Joaquin kit foxes or American badgers denning in active work areas could be killed or injured during excavation or grading activities from being crushed by equipment or entombed in burrows that are covered or filled. They could also become entrapped in pits or trenches if they are left open overnight. American badgers and San Joaquin kit foxes could be struck by vehicles traveling in the project site or to the project site on Patterson Pass Road during construction and maintenance activities, especially if travel is occurring in darkness. The potential for increased injury or mortality from vehicle strikes would be higher during construction when up to 100 workers could be traveling to and from the construction area.

Lighting around the new substation would introduce light in the project site. Light can disrupt activities of nocturnal species such as San Joaquin kit fox and American badger. Because new lighting would be restricted to this area, would operate with motion sensors, and would be directed downward, the effect of new lighting on San Joaquin kit fox and American badger is expected to be negligible since a minimal amount of natural area would be illuminated.

Direct impacts on San Joaquin kit fox or American badger would be significant because the project could diminish the local population of a state and federally listed species and a state species of special concern and lower reproductive potential, contributing to the further decline of these species. Implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and BIO-10a, and PEIR Mitigation Measures BIO-1e, BIO-5c, and BIO-10b would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less-than-significant level because they include surveys to identify if potential San Joaquin kit fox or badger dens are in or near (within 200 feet); establishment of exclusion zones; implementation of measures to prevent inadvertent entrapment of animals; and monitoring to avoid and minimize take. Also, direct loss of habitat for San Joaquin kit fox will be fully mitigated.

No new mitigation measures are proposed.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

2020 Updated PEIR Mitigation Measure BIO-10a: Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger

Where suitable habitat is present for San Joaquin kit fox and American badger in and adjacent to proposed work areas, the following measures, consistent with measures developed in the EACCS, will be implemented to ensure that proposed project does not have a significant impact on San Joaquin kit fox or American badger. *Implementation of some of these measures will require that the Project proponent obtain incidental take permits from USFWS and CDFW (San Joaquin kit fox) before construction begins.* Implementation of state and federal requirements contained in such authorization may constitute compliance with corresponding measures in the PEIR.

- To the maximum extent feasible, suitable dens for San Joaquin kit fox and American badger will be avoided.
- All project proponents will retain qualified approved biologists (as determined by USFWS) to conduct a preconstruction survey for potential San Joaquin kit fox dens. Resumes of biologists will be submitted to USFWS for review and approval prior to the start of the survey.
- Preconstruction surveys for American badgers will be conducted in conjunction with San Joaquin kit fox preconstruction surveys.
- The preconstruction survey will be conducted no less than 14 days and no more than 30 days before the beginning of ground disturbance, or any activity likely to affect San Joaquin kit fox. The biologists will conduct den searches by systematically walking transects through the project area and a buffer area to be determined in coordination with USFWS and CDFW. Transect distance should be based on the height of vegetation such that 100% visual coverage of the project area is achieved. If a potential or known den is found during the survey, the biologist will measure the size of the den, evaluate the shape of the den entrances, and note tracks, scat, prey remains, and recent excavations at the den site. The biologists will also determine the status of the dens and map the features. Dens will be classified in one of the following four den status categories defined by USFWS.
    - Potential den: Any subterranean hole within the species' range that has entrances of appropriate dimensions and for which available evidence is sufficient to conclude that it is being used or has been used by a kit fox. Potential dens include (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, ground squirrel) that otherwise has appropriate characteristics for kit fox use; or an artificial structure that otherwise has appropriate characteristics for kit fox use.
    - Known den: Any existing natural den or artificial structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or current radiotelemetry or spotlighting data; kit fox sign such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has

been used by a kit fox (USFWS discourages use of the terms *active* and *inactive* when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly).

  - Known natal or pupping den: Any den that is used, or has been used at any time in the past, by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for purposes of this definition either term applies.
  - Known atypical den: Any artificial structure that has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

Written results of the survey including the locations of any potential or known San Joaquin kit fox dens will be submitted to USFWS within 5 days following completion of the survey and prior to the start of ground disturbance or construction activities.

- After preconstruction den searches and before the commencement of repowering activities, exclusion zones will be established as measured in a radius outward from the entrance or cluster of entrances of each den. Repowering activities will be prohibited or greatly restricted within these exclusion zones. Only essential vehicular operation on existing roads and foot traffic will be permitted. All other repowering activities, vehicle operation, material and equipment storage, and other surface-disturbing activities will be prohibited in the exclusion zones. Barrier fencing will be removed within 72 hours of completion of work. Exclusion zones will be established using the following parameters.
  - Potential and atypical dens: A total of four or five flagged stakes will be placed 50 feet from the den entrance to identify the den location.
  - Known den: Orange construction barrier fencing will be installed between the work area and the known den site at a minimum distance of 100 feet from the den. The fencing will be maintained until construction-related disturbances have ceased. At that time, all fencing will be removed to avoid attracting subsequent attention to the den.
  - Natal/pupping den: USFWS will be contacted immediately if a natal or pupping den is discovered in or within 200 feet of the work area.
- Any occupied or potentially occupied badger den will be avoided by establishing an exclusion zone consistent with a San Joaquin kit fox potential burrow (i.e., four or five flagged stakes will be placed 50 feet from the den entrance).
- In cases where avoidance is not a reasonable alternative, limited destruction of potential San Joaquin kit fox dens may be allowed as follows.
  - Natal/pupping dens: Natal or pupping dens that are occupied will not be destroyed until the adults and pups have vacated the dens and then only after consultation with USFWS.

Removal of natal/pupping dens requires incidental take authorization from USFWS and CDFW.

- Known dens: Known dens within the footprint of the activity must be monitored for 3 days with tracking medium or an infrared camera to determine current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit fox activity is observed during this period, the den will be monitored for at least 5 consecutive days from the time of observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged by partially plugging its entrance(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied will the den be excavated under the direction of a biologist. If the fox is still present after 5 or more consecutive days of monitoring, the den may be excavated when, in the judgment of the biologist, it is temporarily vacant, such as during the fox's normal foraging activities. Removal of known dens requires incidental take authorization from USFWS and CDFW.
- Potential dens: If incidental take permits have been received (from USFWS and CDFW), potential dens can be removed (preferably by hand excavation) by biologist or under the supervision of a biologist without monitoring, unless other restrictions were issued with the incidental take permits. If no take authorizations have been issued, the potential dens will be monitored as if they are known dens. If any den was considered a potential den but was later determined during monitoring or destruction to be currently or previously used by kit foxes (e.g., kit fox sign is found inside), then all construction activities will cease and USFWS and CDFW will be notified immediately.

- Nighttime work will be minimized to the extent possible. The vehicular speed limit will be reduced to 10 miles per hour during nighttime work.
- Pipes, culverts, and similar materials greater than 4 inches in diameter will be stored so as to prevent wildlife species from using these as temporary refuges, and these materials will be inspected each morning for the presence of animals prior to being moved.
- A representative appointed by the project proponent will be the contact for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured, or entrapped kit fox. The representative will be identified during environmental sensitivity training (2020 Updated PEIR Mitigation Measure BIO-1b) and his/her name and phone number will be provided to USFWS and CDFW. Upon such incident or finding, the representative will immediately contact USFWS and CDFW.
- The Sacramento USFWS office and CDFW will be notified in writing within 3 working days of the accidental death or injury of a San Joaquin kit fox during project-related activities. Notification must include the date, time, and location of the incident, and any other pertinent information.

PEIR Mitigation Measure BIO-10b: Compensate for loss of suitable habitat for San Joaquin kit fox and American badger

Where permanent impacts on habitat for San Joaquin kit fox and American badger cannot be avoided or minimized, compensatory mitigation will be undertaken in accordance with mitigation ratios and requirements developed under the EACCS. In the event that incidental take permits are required for San Joaquin kit fox, compensatory mitigation will be undertaken in accordance with the terms of permits in consultation with USFWS and CDFW.

Impact BIO-11: Avian mortality resulting from interaction with wind energy facilities (significant and unavoidable)

The PEIR (Alameda County Community Development Agency 2014) used the following assessment method. Estimated annual fatalities for non-repowered and repowered scenarios were calculated and presented, followed by a discussion and summary of impacts on individual species and groups of species. A similar approach was used for this analysis, to extrapolate potential fatalities among avian species from the record of other repowered projects, with updates for new information as noted in Table 3.4-8a. Unlike the PEIR, this analysis uses an RSA metric as explained earlier in Section 3.4.2, *Environmental Impacts*, under *Methods for Analysis*, that is presented in Table 3.4-8b. For each species or group, the two tables together show:

- The number of fatalities that would have occurred at the non-repowered turbines for the project site, based on an equivalent level of generating capacity (80 MW).

- The ~~mortality~~ fatality rates for each repowered project, extrapolated to the size of the proposed project to calculate an estimated number of fatalities given those rates.
- The magnitude of estimated change as a percent change from the non-repowered or baseline ~~mortality level~~ fatality rates.
- For each species or group of species, in Table 3.4-8b, the minimum, maximum, and average number of estimated fatalities based on an average of all the repowering projects completed to date, using both MW capacity and RSA metrics.

The estimated changes in mortality associated with the project are shown in Table 3.4-8a. Focused discussion of each species or group is given following the table. First, though, a few important considerations should be noted:

- For nearly all projects and all species, predicted fatalities are low compared to the non-repowered baseline condition. The exceptions are burrowing owl, red-tailed hawk, golden eagle, prairie falcon, and native non-raptors. In the case of burrowing owl, predicted fatalities are somewhat high (108% of baseline) for Diablo Winds, and are very low (average 6% of baseline) for the other four repowered projects. This result reflects the patchy distribution of burrowing owls across the APWRA; only Diablo Winds was sited in a location with a high concentration of burrowing owls, so only it has a high fatality rate. The non-repowered estimate reflects data from locations across the entire APWRA and so is predictably a fairly low number. The same rationale likely explains the one high value for red-tailed hawk, 129% of baseline at Golden Hills (versus average 41% of baseline at the four other repowered sites). It appears that red-tailed hawks are exceptionally abundant at this site, which does not show elevated fatality rates for any other species or species group except the golden eagle, which is also above baseline at 139% (versus average 59% of baseline at the other four repowered sites). The golden eagle, too, seems to be unusually abundant at the Golden Hills site. With regard to the prairie falcon fatalities at Buena Vista and Golden Hills North, this is a rare species and the seemingly high fatality rate is a chance outcome from a small dataset with only a few fatalities ever recorded. Finally, native non-raptor fatalities appear to be unusually high at the Golden Hills and Golden Hills North sites. As previously discussed in Section 3.4.2 under *Methods for Analysis*, these were the only two projects where the carcass surveys used trained dogs and short (7-day) survey intervals, which resulted in small bird and bat detection rates far higher than recorded in any previous study. Thus, the seemingly high fatality rates for these projects most likely reflects very poor detection of small birds and bats in older studies performed at the non-repowered and the early repowered projects.

- The MW and RSA metrics have similar performance. Although turbine efficiency, as measured in units of RSA per MW capacity, is quite variable, ranging from 0.26 to 0.46 ha RSA per MW across the five repowered projects, the fatality rates predicted by capacity versus RSA are similar, ranging from 2% lower to 51% higher when the RSA basis is compared to the capacity basis. Overall, avian fatality rates are an average of 20% higher when calculated on an RSA basis rather than a capacity basis. Bat fatality rates, however, are nearly identical, differing by less than 1% between the two metrics. It is also noteworthy that the proposed project has lower turbine efficiency than any of the five repowered projects, carrying 0.51 ha RSA per MW capacity. Thus, compared to the other repowered projects, the proposed project shows a greater disparity between fatality rate estimates on a MW basis and estimates on an RSA basis.

- The range of predicted fatalities for repowered projects is quite large. In the most extreme case it ranges from 0 to 130 birds per year for burrowing owl, and even a data-rich metric such as “all raptors” varies by a factor of 5 from minimum to maximum. ~~These results indicate the high level of uncertainty associated with attempting to predict mortality~~ The reasons for these differences cannot be shown, but it is known that repowered sites vary considerably in the type and quality of avian habitats available. For instance, proximity to burrowing owl colonies, intensity of golden eagle foraging, access to aquatic and wetland habitats, and proximity to electrical transmission towers (a common form of raptor nesting habitat) vary across the APWRA. Accordingly, it is appropriate to expect that fatality rates will vary across the APWRA in response to this uneven distribution of habitat. These results indicate the high level of uncertainty associated with attempting to predict fatality rates at a new site (Mulqueeney) compared to a group of only five different known sites. It is likely that observed ~~mortality~~ fatality rates at Mulqueeney would fall within the range of these five repowered projects, but it is possible that rates would fall outside that range.

- Several special-status avian species, including California condor, bald eagle, and sandhill crane have been observed flying over or near to the proposed project and/or within the APWRA but only once or infrequently and have not had recorded fatalities in any monitoring within the APWRA. ~~Since there are no~~ For California condor, there have been no recorded fatalities and only a single observation in the APWRA. The project area provides suitable habitat and there is expected to be an increasing population trend for this species in response to regional species conservation, enhancement, and recovery measures; thus fatality risk is expected to increase over time. For bald eagle, there are no documented recorded fatalities based on either the nonrepowered turbine monitoring or the repowering projects monitored to date~~, potential fatality rates cannot be predicted, and fatalities are unlikely.~~. A single anecdotal account of a bald eagle fatality at nonrepowered turbines has been provided to the County, however the circumstances of this fatality cannot be verified, and a single undocumented fatality cannot be used to accurately generate fatality rates. Since the fatality was apparently discovered at a nonrepowered turbine site, it may have limited relevance for repowered projects. Future fatalities are unlikely as the project area lacks suitable habitat and observed bald eagles seem to be transitional through the project area. For sandhill crane, no fatalities have been recorded, the project area lacks suitable habitat, and the observed birds have been at high elevation, evidently transitional through the project area. Fatalities are not expected to occur in this species. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g, BIO-11h and BIO-11i, and PEIR Mitigation Measures BIO-11a through BIO-11f would reduce the risk of fatalities in these species.

American Kestrel

Fatality monitoring information indicates the final Vasco Wind monitoring results (Brown et al. 2016) showed nearly the same estimated ~~mortality~~ fatality rate for American kestrel (0.28 fatality/MW/ year) compared to the ~~mortality~~ fatality rate reported in the PEIR (0.30 fatality/MW/year). ~~Mortality~~ Fatality rates at repowered sites ranged from 0.09 to 0.28, average 0.14 fatality/MW/year, much lower than the 0.59 fatality/MW/year reported for the non-repowered program (Table 3.4-4). The PEIR stated that the 450 MW program could decrease annual fatalities of American kestrel by 31–79% relative to a non-repowered program, and that is consistent with the results of this analysis, which finds reductions of 52–85% for the five repowered projects (Table 3.4-8). Consequently, the mortality estimates of the PEIR remain unchanged relative to the project's potential effects on American kestrel.

As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 7–33 American kestrel fatalities per year, with an average expectation of 12 fatalities/year when calculated on a MW basis, or 17.3 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) recorded 11 observations of American kestrels on the project site, which indicates that the species is a moderately common raptor, with a likelihood of future ~~mortalities~~ fatalities.

Table 3.4-8a. Estimated Annual Avian Fatalities for the Mulqueeney Project Site Based on Existing Fatality Survey Data (updated from Tables 3.4-13 and 3.4-14 in the PEIR)

		Repowered[a,b]									
		MW Basis (fatalities/year) and Comparison to Baseline									
		Buena Vista		Diablo Winds		Golden Hills		Golden Hills North		Vasco Winds	
Species or Group	Not Repowered	Fatalities /yr	vs baseline	Fatalities /yr	vs baseline	Fatalities /yr	vs baseline	Fatalities /yr	vs baseline	Fatalities /yr	vs baseline
American kestrel	47.2	8.8	19%	7.2	15%	7.8	16%	13.9	29%	22.7	48%
Barn owl	19.3	2.1	11%	1.6	8%	2.4	12%	1.7	9%	1.8	9%
Burrowing owl	62.0	0.0	0%	67.2	108%	15.2	25%	0.0	0%	4.5	7%
Golden eagle	6.5	5.8	90%	0.8	12%	9.0	139%	5.2	81%	3.5	54%
Loggerhead shrike	15.0	0.0	0%	0.0	0%	2.5	17%	0.0	0%	1.9	13%
Prairie falcon	1.6	2.1	131%	nd	nd	0.4	22%	1.7	108%	0.7	45%
Red-tailed hawk	35.1	12.8	36%	16.0	46%	45.3	129%	12.2	35%	16.8	48%
Swainson's hawk	0.1	0.0	0%	nd	nd	0.0	0%	0.0	0%	0.0	0%
Tricolored blackbird	nd	0.0	nd	nd	nd	1.4	nd	1.7	nd	1.7	nd
Vaux's swift	nd	0.0	nd	nd	nd	14.5	nd	0.0	nd	0.0	nd
White-tailed kite	nd	0.0	nd	nd	nd	4.5	nd	0.0	nd	0.0	nd
Yellow-breasted chat	nd	0.0	nd	nd	nd	0.0	nd	1.7	nd	1.7	nd
Yellow warbler	nd	2.1	nd	nd	nd	5.5	nd	1.7	nd	1.7	nd
All raptors	195	30	15%	97	50%	92	47%	47	24%	52	27%
All native non-raptors	360	121	34%	201	56%	607	169%	755	209%	163	45%
All bats	nd	63	nd	nd	nd	541	nd	1167	nd	257	nd
Hoary Bats	nd	19	nd	nd	nd	212	nd	197	nd	80	nd
Mexican free-tailed bats	nd	4	nd	nd	nd	294	nd	913	nd	150	nd

nd = no data; this species was not evaluated in the represented project.

"Vs. baseline" columns show the fraction of baseline ~~mortality~~ fatality rate observed at a given project. Values in excess of 100% indicate increased mortality relative to baseline.

Buena Vista and Diablo Winds values are not used in calculation of minimum, maximum, or average values for non-raptors or bats; see Section 3.4.3, *Environmental Impacts*, under *Methods for Analysis* for rationale.

[a] As discussed in Chapter 2, *Project Description*, the proposed project entails the installation of 36 turbines ranging in nameplate capacity from 2.2 to 4.2 MW with a combined maximum generating capacity of 80 MW. Although the current project layout assumes the use of 36 x 2.2 MW turbines, resulting in total generating capacity of 79.2 MW, this analysis is conservatively based on a total generating capacity of 80 MW for the project site.

[b] All ~~mortality~~ fatality rates taken from Tables 3.4-4 and 3.4-5 (see notes there appended for data sources and other caveats) and extrapolated to the capacity and total RSA of the Mulqueeney project.

Table 3.4-8b. Estimated Annual Avian Fatalities for the Mulqueeney Project Site Based on Existing Fatality Survey Data (updated from Tables 3.4-13 and 3.4-14 in the PEIR)

	Repowered[a,b]								
	RSA Basis (fatalities/year)					Range		Averages	
Species or Group	Buena Vista Fatalities/yr	Diablo Winds Fatalities/yr	Golden Hills Fatalities/yr	Golden Hills North Fatalities/yr	Vasco Winds Fatalities/yr	Minimum	Maximum	MW basis	RSA basis
American kestrel	15.2	14.0	9.0	15.4	33.2	7.1	33.2	12.0	17.3
Barn owl	3.6	3.1	2.7	1.9	2.6	1.6	3.6	1.9	2.8
Burrowing owl	0.0	130.4	17.6	0.0	6.5	0.0	130.4	17.2	30.9
Golden eagle	10.0	1.6	10.4	5.8	5.1	0.8	10.4	4.8	6.6
Loggerhead shrike	0.0	0.0	2.9	0.0	2.8	0.0	2.9	0.9	1.1
Prairie falcon	3.6	nd	0.4	1.9	1.0	0.4	3.6	1.2	1.8
Red-tailed hawk	21.9	31.1	52.6	13.5	24.6	12.1	52.6	20.4	28.7
Swainson's hawk	0.0	nd	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tricolored blackbird	0.0	nd	1.6	1.9	2.5	0.0	2.5	1.2	1.5
Vaux's swift	0.0	nd	16.9	0.0	10.3	0.0	16.9	5.4	6.8
White-tailed kite	0.0	nd	5.3	0.0	0.0	0.0	5.3	1.1	1.3
Yellow-breasted chat	0.0	nd	0.0	1.9	0.0	0.0	1.9	0.4	0.5
Yellow warbler	3.6	nd	6.3	1.9	16.6	1.7	16.6	5.2	7.1
All raptors	51	188	107	52	75	29	188	63	95
All native non-raptors	208	390	705	836	238	161	836	503	593
All bats	109	nd	627	1293	375	254	1293	648	765
Hoary Bats	33	nd	246	218	118	80	246	163	194
Mexican free-tailed bats	7	nd	341	1011	220	150	1011	452	524

nd = no data; this species was not evaluated in the represented project.

[a] All estimates based on a proposed RSA of 40.716 ha for the Mulqueeney project site.

[b] All ~~mortality~~ fatality rates taken from Tables 3.4-4 and 3.4-5 (see notes there appended for data sources and other caveats) and extrapolated to the capacity and total RSA of the Mulqueeney project.

Summary: The PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. This conclusion was based on combined estimates of avian mortality from three different repowering projects in the APWRA, estimated as fatalities/MW/year, in various combinations of species (all raptor species, each of eight individual raptor species, and all native non-raptor species). These estimates indicated reductions of 32–83% in raptor fatalities (e.g., 31–79% fewer American kestrel fatalities for buildout of 450 MW in the APWRA). The PEIR acknowledged, however, that the avian mortality estimates were uncertain, stating: "… while repowering is intended to reduce fatalities, enough uncertainty remains in light of project- and site-specific data to warrant a conservative approach in the impact analysis. Accordingly, the continued or increased loss of birds (including special-status species) *at a rate potentially greater than the existing baseline fatality rates* is considered a significant and unavoidable impact" [emphasis added] (Alameda County Community Development Agency 2014:3.4-103).[6]

The PEIR recognized the uncertainty of its avian mortality estimates, as well as the consideration of inter-annual and inter-project variation in ~~mortality~~ fatality rates, and concluded that ~~mortality~~ fatality rates under the 450 MW repowering program could exceed baseline, non-repowered ~~mortality~~ fatality rates (Alameda County Community Development Agency 2014). More specifically, while the PEIR used the "best available" data from three repowering projects to estimate a possible reduction of fatalities under the repowering program, the PEIR's impact conclusion for the 450 MW repowering program expressly acknowledged the uncertainty inherent in such data.

Thus, while the PEIR presented mortality estimates that looked promising, those estimates were uncertain and ultimately were not relied upon as the basis for its impact conclusion. The PEIR concluded that more data were needed: "[p]ostconstruction monitoring, once the turbines are in operation, will provide data to quantify the actual extent of change in avian fatalities from repowering and the extent of avian fatality for projects in the program area …" (Alameda County Community Development Agency 2014:3.4-119). In light of this uncertainty, the PEIR required adaptive management for any repowering project where "… fatality monitoring … results in an estimate that exceeds the preconstruction baseline fatality estimates (i.e., estimates at the non-repowered turbines as described in this PEIR) … to ensure that the best available science is used to minimize impacts to below baseline" (Alameda County Community Development Agency 2014:3.4-116).

While the PEIR set forth multiple measures to address avian mortality, it concluded that these measures would not reduce the impact to a less-than-significant level. This conclusion holds true for the project, and, although it remains difficult to estimate ~~mortality~~ fatality rates with certainty, continued monitoring would contribute to the body of knowledge informing this effort.

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[6] Similar statements are repeated throughout the PEIR; see page 3.4-121:

> As described above, for all avian focal species analyzed, a fully repowered program area would be expected to reduce estimated fatality rates. However, fatalities would still be expected to result from the operation of the repowered turbines, and uncertainty surrounding the accuracy of the estimated fatality rates and the types of species potentially affected remains. Considering this information, and despite the anticipated reductions in avian impacts compared to the baseline rates, the County has determined to use a conservative approach for the impact assessment, concluding that turbine related fatalities could constitute a substantial adverse effect on avian species because the rates for some or all of the species could be greater than the baseline rates. This impact would be significant. Implementation of Mitigation Measures BIO-11a through BIO-11i would reduce this impact, but not to a less-than-significant level; accordingly, this impact is considered significant and unavoidable.

Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g, BIO-11h and BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on American kestrel but not to a less-than-significant level.

Barn Owl

Fatality monitoring information indicates the final Vasco Wind monitoring results (Brown et al. 2016) showed the same estimated ~~mortality~~ fatality rate for barn owl compared to the ~~mortality~~ fatality rate reported in the PEIR (0.02 fatality/MW/year). ~~Mortality~~ Fatality rates at repowered sites ranged from 0.02 to 0.03, average 0.024 fatality/MW/year, much lower than the 0.24 fatality/MW/year reported for the non-repowered program (Table 3.4-4). The PEIR stated that the 450 MW program could decrease annual fatalities of barn owl by 81–89% relative to a non-repowered program, and that is consistent with the results of this analysis, which finds reductions of 88–92% for the five repowered projects (Table 3.4-8). Consequently, the mortality estimates of the PEIR remain unchanged relative to the project's potential effects on barn owl.

As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 1.6–3.6 barn owl fatalities per year, with an average expectation of 1.9 fatalities/year when calculated on a MW basis, or 2.8 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) did not record any observations of barn owls on the project site, which indicates that there is low potential for future ~~mortalities~~ fatalities. The PEIR noted that barn owl populations are stable to possibly declining in the state and that it was uncertain what effect repowering may have on local barn owl populations. The PEIR also noted that the higher RSA of repowered turbines may reduce the risk of turbine collision because barn owls typically hunt in low quartering flights at about 1.5–4.5 meters (5–15 feet) above the ground. The very substantial reductions in fatalities observed at all five repowering projects, relative to the non-repowered baseline, would tend to confirm this inference.

Summary: The summary analysis for American kestrel is applicable for the barn owl to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g, BIO-11h and BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on barn owl but not to a less-than-significant level.

Burrowing Owl

Fatality monitoring information indicates the final Vasco Wind monitoring results (Brown et al. 2016) showed a substantially lower estimated ~~mortality~~ fatality rate for burrowing owl (0.06 fatality/MW/ year) compared to the ~~mortality~~ fatality rate reported in the PEIR (0.30 fatality/MW/year). ~~Mortality~~ Fatality rates at repowered sites ranged from 0 to 0.84, average 0.33 fatality/MW/year, less than half the 0.78 fatality/MW/year reported for the non-repowered program (Table 3.4-4), although Diablo Winds has shown an elevated ~~mortality~~ fatality rate of 0.84 fatality/MW/year, a consequence of the project's location at a site with unusually abundant burrowing owls. The PEIR stated that the 450 MW program could decrease annual fatalities of burrowing owl by up to 91%, or could increase them by up to 48%, relative to a non-repowered program. This analysis suggests a comparable range of possibilities, with reductions of up to 100% or increases of up to 8% observed at the five repowered projects (Table 3.4-8). Consequently, the

~~mortality~~ fatality rate estimates of the PEIR remain unchanged relative to the project's potential effects on burrowing owl.

The avian use surveys (ICF 2020b) did not identify any nesting burrowing owls in the project site. However, those surveys were limited to eight plots within the project site, and no surveys were performed for the purposes of locating burrowing owls. Burrowing owls were observed at 6 locations on the project site during field surveys conducted between June 2019 and May 2020. Lands adjacent to the project on the north and northwest have been established as conservation for the burrowing owl, and the 156-acre Two Sisters Burrowing Owl Preserve is entirely surrounded by the project site (California Department of Fish and Wildlife 2020). Proximity to these preserves shows a substantial likelihood that burrowing owls occur within the project site, but their location and numbers are unknown. While burrowing owl are expected to occupy the project site, they are highly mobile birds that utilize different burrows, in different locations, on a year-to-year basis. For this reason, the location of active burrows at any given point in time is not a practical or effective constraint on permanent turbine siting.

As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 0–130 burrowing owl fatalities per year, with an average expectation of 17 fatalities/year when calculated on a MW basis, or 31 fatalities/year on an RSA basis.

~~The PEIR noted that "A growing body of circumstantial evidence indicates that many of the burrowing owl fatalities found during fatality surveys are due to predation rather than turbine collision." It concluded "… the potential reduction in turbine-related burrowing owl fatalities may be underestimated because of the inability to distinguish fatalities resulting from predation from those caused by turbine collision." Just after the PEIR was published, the Alameda County avian monitoring team, with approval of the SRC, began a study of background mortality (ICF 2016). The study was prompted by the finding that substantial numbers of small bird carcasses—including burrowing owls—continued to accumulate in the search area around turbines during the period of seasonal shutdown, even though turbines were not operating (ICF 2016). Overall, the study reported that the patterns were relatively clear for small birds potentially subject to predation, but they were not as clear for burrowing owls. The authors of the study noted that California was in the fourth year of a historic drought, and anecdotal information suggested that the burrowing owl population was rapidly declining. Additionally, as H. T. Harvey & Associates (2018b) noted in their monitoring report for the Golden Hills project "… the fact that 84% of the Year 2 burrowing owl fatalities were found as feather spots or carcass remnants, mostly around burrows and along erosion-control wattles, suggests that predation was the primary cause of fatalities for this species…." Thus, uncertainty still remains surrounding burrowing owl mortality rates.~~

Summary: The summary analysis for American kestrel is applicable for the burrowing owl to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on burrowing owl but not to a less-than-significant level.

Golden Eagle

The fatality monitoring information available since the PEIR was published indicate the final Vasco Wind monitoring results (Brown et al. 2016) showed a ~~substantially~~ higher estimated ~~mortality~~ fatality rate for golden eagle (0.~~13~~04 fatality/MW/year) than the rate reported in the PEIR (0.03 fatality/MW/year). The average ~~mortality~~ fatality rate for the Golden Hills project (0.~~26~~113 fatality/MW/year) was also higher than the rate reported in the PEIR (Table 3.4-3). The PEIR stated that the 450 MW program could decrease annual golden eagle fatalities by 32–83% relative to a non-repowered program, whereas the five repowered projects here considered indicate fatalities ranging from an 88% reduction to a 39% increase relative to the non-repowered program, with results from 4 of the 5 repowered sites indicating a probable decrease in fatalities relative to the non-repowered program. However, the 39% increase, observed at the Golden Hills project, renders the outcome of repowering less clear for this species than was indicated in the PEIR. At this point, the predictors of high-versus-~~-~~low-~~-~~level golden eagle ~~mortality~~ fatality rates at a given wind project remain unknown.

As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 0.8–10.4 golden eagle fatalities per year, with an average expectation of 4.9 fatalities/year when calculated on a MW basis, or 6.6 fatalities/year on an RSA basis. Avian use surveys and raptor nesting surveys (ICF 2020b) have established that the golden eagle is the one of the most common raptors in the project site. This indicates that future ~~mortalities~~ fatalities are likely.

Unlike other species addressed in this analysis, the golden eagle within the APWRA has been the subject of extensive field studies and models to ascertain its population status and its likely long-term responses to fatalities caused by wind energy developments. This work was synthesized by Hunt et al. (2017), who estimated that the annual reproductive output of 216–255 breeding pairs would have been necessary to support published estimates of 55–65 turbine-caused fatalities per year in the APWRA, concluding that the area has “a stable breeding population, but one for which any further decrease in vital rates would require immigrant floaters [subadults and nonbreeding adults] to fill territory vacancies.” This estimate would indicate that the 280 territorial pairs present in the Diablo Range (Wiens et al. 2015) would likely be adequate to maintain the region’s golden eagle population, but with a long-term population reduction possible if further turbine-caused fatalities were to occur. There are substantial uncertainties in this conclusion, however. USFWS notes that the severe drought that affected the Diablo Range during 2014–2016 monitoring resulted in average annual productivity approximately half of that assumed by Hunt et al. (2017), indicating that during times of low productivity, a much larger population would be needed to achieve a stable population size under the stress of wind project mortality (U.S. Fish and Wildlife Service 2019). Also, the work of Hunt et al. (2017) assumes that the Diablo Range eagles are a discrete population, but they acknowledge that up to 17% of radio transmitter-tagged eagles used in their study left the Diablo Range area or may have originated from outside the area and migrated in. These “travelers” are predominately juvenile, subadult, or nonbreeding adult eagles, a group which also comprises a disproportionate fraction of the golden eagle ~~mortalities~~ fatalities in the APWRA. Thus, the eagles in the APWRA make up an anomalously small fraction of the reproductive eagles in the Diablo Range, as well as an anomalously large fraction of those eagles most likely to have come from or be migrant to areas outside the Diablo Range. These migrant eagles may be presumed to have come from the LAP. The LAP is calculated for golden eagles based on the number of eagles within 109 miles (the golden eagle natal dispersal distance) of a project site (U.S. Fish and Wildlife Service 2013). For the proposed project, the LAP encompasses approximately 29,600 square miles (excluding the Pacific

Ocean and San Francisco Bay). The entire Diablo Range subject to study by USGS is within the project site LAP for golden eagles, occupying approximately 7% of the project site LAP.

Summary: The summary analysis for American kestrel is applicable for the golden eagle to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on golden eagle but not to a less-than-significant level. The proposed project may affect the LAP at its current size; this risk is greatest when the population experiences other stressors as well, such as drought.

Loggerhead Shrike

The PEIR noted that no documented fatalities of loggerhead shrikes had occurred at any of the repowered projects in the APWRA at the time the PEIR was prepared. The final 2 years of monitoring at Vasco Winds did identify loggerhead shrike fatalities, leading to an estimated fatality rate of 0.024 fatalities/MW/year for that facility. The Golden Hills project documented a fatality rate of 0.031 fatalities/MW/year for that project, so both of these projects (the only repowered projects to have observed loggerhead shrike fatalities) show a large reduction from the non-repowered ~~mortality~~ fatality rate provided in the PEIR, 0.19 fatalities/MW/year (Table 3.4-4). As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 0–2.9 loggerhead shrike fatalities per year, with an average expectation of 0.9 fatalities/year when calculated on a MW basis, or 1.1 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) recorded 15 observations of loggerhead shrike on the project site, which indicates that there is a substantial potential for future ~~mortalities~~ fatalities.

The PEIR noted that the lack of documented fatalities suggests that there may be a reduced level of fatalities from repowered turbines, and this analysis tends to confirm that inference. Consequently, the conclusions of the PEIR remain unchanged relative to the project's potential effects on loggerhead shrike.

Summary: The summary analysis for American kestrel is applicable for the loggerhead shrike to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on loggerhead shrike but not to a less-than-significant level.

Prairie Falcon

Although rare, prairie falcon fatalities have been recorded at non-repowered facilities and at four of the five repowered facilities (Table 3.4-4). Observed fatality rates at repowered facilities have ranged from 0.004 to 0.026 fatalities/MW/year, representing a 78% decrease to a 31% increase relative to the non-repowered baseline. The PEIR noted that fatality estimates at repowered sites were not available because no fatalities had been documented at repowered turbines at the time the PEIR was prepared. The PEIR also concluded that a lack of documented fatalities suggests that there may be a reduced level of fatality from repowered turbines, as well as a potentially lower risk to this species. The repowered data reported here provide some support for this conclusion; average observed fatality rates for repowered facilities are somewhat lower than the rate for non-repowered facilities, changing from 0.020 to 0.014 fatalities/MW/year (Table 3.4-4). This represents a 30% reduction.

As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 0.4–3.6 prairie falcon fatalities per year, with an average expectation of 1.2 fatalities/year when calculated on a MW basis, or 1.8 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) recorded two observations of prairie falcons on the project site, which indicates that there is a potential for future ~~mortalities~~ fatalities.

Summary: The summary analysis for American kestrel is applicable for the prairie falcon to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on prairie falcon but not to a less-than-significant level.

Red-Tailed Hawk

Fatality monitoring information indicates the final Vasco Wind monitoring results (Brown et al. 2016) showed a slightly lower estimated ~~mortality~~ fatality rate for red-tailed hawk (0.21 fatality/MW/year) compared to the ~~mortality~~ fatality rate reported in the PEIR (0.25 fatality/MW/year). ~~Mortality~~ Fatality rates at repowered sites ranged from 0.15 to 0.57, average 0.26 fatality/MW/year; at 4 of the 5 repowered sites, this was lower than the 0.44 fatality/MW/year reported for the non-repowered program (Table 3.4-4). The PEIR stated that the 450 MW program could decrease annual fatalities of red-tailed hawks by 23–69% relative to a non-repowered program; that is generally consistent with the results of this analysis, which finds changes ranging from a 65% reduction to a 29% increase for the five repowered projects, with substantial reductions indicated by average fatalities whether calculated on a MW or RSA basis (Table 3.4-8). Consequently, the mortality estimates of the PEIR remain unchanged relative to the project's potential effects on red-tailed hawks. The 29% increase in observed fatalities at the Golden Hills site, relative to the non-repowered condition, warrants some further discussion. Elevated mortalities were observed at Golden Hills in all monitoring years, with 78 fatalities in the first year, 38 in the second year and 30 in the third year (H. T. Harvey & Associates 2020. The authors of the first-year Golden Hills report noted that results for red-tailed hawk may have been skewed by perching and nesting opportunities created by nearby old turbines (H. T. Harvey & Associates 2018a:xi). Consequently, the recently available information suggests that although reductions in red-tailed hawk fatalities from repowering have been observed during the majority of monitoring studies and years, the outcome of repowering is less clear for this species than was indicated in the PEIR, although average estimates across projects, both standard and weighted, still suggest a reduction.

As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 12–53 red-tailed hawk fatalities per year, with an average expectation of 21 fatalities/year when calculated on a MW basis, or 29 fatalities/year on an RSA basis. Avian use surveys and raptor nesting surveys

(ICF 2020b) have established that the red-tailed hawk is the most common raptor, apart from the common raven[7], in the project site. This indicates that future ~~mortalities~~ fatalities are likely.

Summary: The summary analysis for American kestrel is applicable for the red-tailed hawk to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on red-tailed hawk but not to a less-than-significant level.

Swainson's Hawk

The PEIR noted only one recorded Swainson's hawk fatality in the APWRA, in an area of non-repowered turbines (Table 3.4-8); no other fatalities of this species have ever been recorded in the APWRA, consequently there is very little evidence on which to base any quantitative estimate of fatality risk. Accordingly, it is expected that the ~~mortality~~ fatality rate for Swainson's hawk would remain at or near zero for the project. Avian use surveys (ICF 2020b) recorded three observations of Swainson's hawk in the project site, which indicates ~~that there is~~ a potential for future ~~mortalities~~ fatalities. The PEIR concluded that adverse effects on the local Swainson's hawk population were unlikely to occur, and recently available information supports this conclusion with regard to the proposed project.

Summary: The summary analysis for American kestrel is applicable for the Swainson's hawk to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on Swainson's hawk but not to a less-than-significant level.

Tricolored Blackbird

At the time the PEIR was prepared, tricolored blackbird had not been recorded as a fatality either at non-repowered turbines or at repowered turbines. Since that time, the Vasco Winds, Golden Hills, and Golden Hills North projects have each reported one fatality, resulting in an average ~~mortality~~ fatality rate of 0.02 fatality/MW/year, or 0.05 fatality/ha RSA/year, at repowered facilities (Tables 3.4-4 and 3.4-5). As shown in Table 3.4-8, the proposed project could be expected to result in 0–2.5 fatalities per year, with an average expectation of 1.2 fatalities/year on a MW basis or 1.5 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) recorded one tricolored blackbird observation in the project site, and there have been incidental observations at wetlands in and near the project site, which indicates that there is a potential for future ~~mortalities~~ fatalities.

Summary: The summary analysis for American kestrel is applicable for the tricolored blackbird to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that ~~mortality~~ fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of

[7] The common raven is behaviorally a raptor, but taxonomically a songbird. Studies of raptor fatalities in the APWRA have not included the common raven in estimates of "all raptors" fatality rates.

2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on tricolored blackbird but not to a less-than-significant level.

Vaux's Swift

At the time the PEIR was prepared, Vaux's swift had not been recorded as a fatality either at non-repowered turbines or at repowered turbines. Since that time, the Vasco Winds and Golden Hills projects reported fatalities, resulting in an average fatality rate of 0.12 fatality/MW/year, or 0.29 fatality/ha RSA/year, at repowered facilities (Tables 3.4-4 and 3.4-5). As shown in Table 3.4-8, the proposed project could be expected to result in 0–17 fatalities per year, with an average expectation of 5.4 fatalities/year on a MW basis or 6.8 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) did not record any observations of Vaux's swifts on the project site, but this cannot be taken as evidence of absence since this is primarily a crepuscular and nocturnal species; there is expected to be a potential for future fatalities.

Summary: The summary analysis for American kestrel is applicable for Vaux's swift to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on Vaux's swift but not to a less-than-significant level.

White-Tailed Kite

At the time the PEIR was prepared, white-tailed kite had not been recorded as a fatality either at non-repowered turbines or at repowered turbines. Since that time, one fatality has occurred, in the second year of monitoring at the Golden Hills project (H. T. Harvey & Associates 2018b). No fatalities have occurred at any of the other repowering projects, resulting in an average fatality rate of 0.017 fatalities/MW/year or 0.039 fatalities/ha RSA/year (Tables 3.4-4, 3.4-5). These monitoring results suggest a low mortality rate for this species, but a potential for fatalities remains within the 450 MW program, as well as from the proposed project. As shown in Table 3.4-8, the proposed project would be expected to result in 0–5.3 fatalities per year, with an average expectation of 1.1 fatalities per year on a MW basis, or 1.3 fatalities per year on an RSA basis. Avian use surveys and raptor use surveys (ICF 2020b) have not recorded white-tailed kites in the project site, suggesting a low risk of future mortalities.

Summary: The summary analysis for American kestrel is applicable for the white-tailed kite to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that mortality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on white-tailed kite but not to a less-than-significant level.

Yellow-breasted Chat

At the time the PEIR was prepared, the yellow-breasted chat had not been recorded as a fatality either at non-repowered turbines or at repowered turbines. Since that time, the Golden Hills North project has reported one fatality, resulting in an average fatality rate of 0.003 fatality/MW/year, or 0.007 fatality/ha RSA/year, at repowered facilities (Tables 3.4-4 and 3.4-5). As shown in Table 3.4-8, the proposed project could be expected to result in 0–2 fatalities per year, with an average expectation of 0.4 fatalities/year on a MW basis or 0.5 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) did not record any observations of yellow-breasted chat on the project site, and there is little nesting habitat available on the project site (Table 3.4-3); fatalities are probably most likely during migration.

Summary: The summary analysis for American kestrel is applicable for yellow-breasted chat to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on yellow-breasted chat but not to a less-than-significant level.

Yellow warbler

At the time the PEIR was prepared, the yellow warbler had not been recorded as a fatality at non-repowered turbines. At repowered projects, the Buena Vista, Golden Hills, Golden Hills North and Vasco Winds projects have all reported fatalities, resulting in an average fatality rate of 0.09 fatality/MW/year, or 0.25 fatality/ha RSA/year, at repowered facilities (Tables 3.4-4 and 3.4-5). As shown in Table 3.4-8, the proposed project could be expected to result in 2–17 fatalities per year, with an average expectation of 5.2 fatalities/year on a MW basis or 7.1 fatalities/year on an RSA basis. Avian use surveys (ICF 2020b) did not record any observations of yellow warblers on the project site, and there is little nesting habitat available on the project site (Table 3.4-3); fatalities are probably most likely during migration.

Summary: The summary analysis for American kestrel is applicable for yellow warbler to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that fatality rates may decrease with the transition from old-generation to new-generation turbines. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on yellow warbler but not to a less-than-significant level.

Other Protected Bird Species

The fatality monitoring information available since the PEIR was published indicate the mortality rate for raptors as a group remained unchanged in the final Vasco Wind monitoring report (Brown et al. 2016) at 0.~~64~~65 fatality/MW/year; this corresponds to 1.85 fatalities/ha RSA/year. The Golden Hills project documented an average estimated mortality rate for raptors of 1.~~74~~15 fatalities/MW/year (or 2.62 fatalities/ha RSA/year), a reduction from the non-repowered fatality rate provided in the PEIR (2.43 fatalities/MW/year). The Golden Hills North project documented an average estimated mortality rate for raptors of 0.59 fatality/MW/year (or 1.28 fatalities/ha RSA/year). As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 29–188 raptor fatalities per year, with an average expectation of 63 fatalities/MW/year or 95 fatalities/ha RSA/year. This corresponds to a 50–85% decrease compared to non-repowered rates.

For native non-raptors, a group dominated by small birds such as songbirds, the data reported in the PEIR are based in large part upon surveys at non-repowered sites and at the Buena Vista and Diablo Winds sites. At these sites, surveys occurred too infrequently to reliably detect small bird carcasses. The PEIR data also consider two of the three years of monitoring at Vasco Winds, which involved monitoring at 7-day intervals and resulted in detection of appreciable numbers of small bird carcasses. However, the two years of Vasco Winds monitoring had a diluted effect when pooled with the earlier studies, such that unrealistically low estimates of small bird mortality were reported in the PEIR. As a result, it is difficult to discuss possible changes in fatality rates relative to the non-repowered baseline. The data presented in Table 3.4-4 indicate that the non-repowered baseline fatality rate for small birds was 4.5 fatalities/MW/year, while the average of the Vasco Winds, Golden Hills, and Golden Hills North projects was 5.5 fatalities/MW/year, an increase of 22%. It is likelier, though, that the fatality rate at non-repowered projects was substantially higher. The Golden Hills and Golden Hills North fatality rates were approximately 4.2 times as high as the Buena Vista and Diablo Winds fatality rates. It is plausible that a similar level of underestimation may have affected the estimated fatality rates at non-repowered sites, in which case the non-repowered baseline fatality rate would have been approximately 19 fatalities/MW/year and the data from the two Golden Hills projects would indicate a fatality rate reduction of approximately 78%.

Considering only data from the Vasco Winds, Golden Hills, and Golden Hills North monitoring, all of which involved surveys performed at 7-day intervals (and at the two Golden Hills projects, with the added benefit of surveys using dogs), small bird detection rates averaged 5.5 fatalities/MW/year or 12.9 fatalities/ha RSA/year. These numbers may be an underestimate, since the two Golden Hills surveys that used dogs recovered over twice as many small birds as the Vasco Winds surveys that did not use dogs. The Golden Hills projects alone averaged 7.6–9.4 fatalities/MW/year or 17–21 fatalities/ha RSA/year. As shown in Table 3.4-8, the proposed project would be expected to result in an estimated 163–836 native non-raptor fatalities per year, with an average expectation of 508 fatalities/year on a MW basis, or 593 fatalities/year on an RSA basis.

Summary: The summary analysis for American kestrel Impact BIO-11 is applicable for both raptors and native non-raptors to the extent that the PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that mortality rates may decrease with the transition from old-generation to new-generation turbines. Mitigation is required, and three PEIR Mitigation Measures have been modified. Mitigation Measure BIO-11g was modified to require that a subset of 20 turbines be surveyed at 7-day intervals, in recognition that longer survey intervals have shown limited effectiveness in detecting small bird carcasses. 2020 Updated Mitigation Measure BIO-11h was modified to acknowledge the need to minimize and mitigate impacts on all birds, rather than just raptors; and to acknowledge the 2017 revocation of Interior Order 3330~~. 2020 Updated Mitigation Measure BIO-11i was modified to require painting of one turbine blade~~ and its subsequent, effective restoration under the new federal administration inaugurated in ~~a contrasting color.~~ January 2021. Implementation of 2020 Updated PEIR Mitigation Measures BIO-11b, and BIO-11g through BIO-11i, and PEIR Mitigation Measures BIO-11a, and BIO-11c through BIO-11f would reduce significant impacts on raptors and native non-raptors but not to a less-than-significant level.

PEIR Mitigation Measure BIO-11a: Prepare a project-specific avian protection plan

All project proponents will prepare a project-specific avian protection plan (APP) to specify measures and protocols consistent with the program-level mitigation measures that address avian mortality. The project-specific APPs will include, at a minimum, the following components.

- Information and methods used to site turbines to minimize risk.
- Documentation that appropriate turbine designs are being used.
- Documentation that avian-safe practices are being implemented on project infrastructure.
- Methods used to discourage prey for raptors.
- A detailed description of the postconstruction avian fatality monitoring methods to be used (consistent with the minimum requirements outlined in Mitigation Measure BIO-11g).
- Methods used to compensate for the loss of raptors (consistent with the requirements of 2020 Updated PEIR Mitigation Measure BIO-11h).

Each project applicant will prepare and submit a draft project-specific APP to the County. The draft APP will be reviewed by the technical advisory committee (TAC) for consistency and the inclusion of appropriate mitigation measures that are consistent with the PEIR and recommended for approval by the County. Each project applicant must have an approved Final APP prior to commercial operation.

2020 Updated PEIR Mitigation Measure BIO-11b: Site turbines to minimize potential mortality of birds

~~Siting of turbines—~~Consistent with PEIR Mitigation Measure BIO-11b, and in recognition that focused siting of turbines using analyses of landscape features and location-specific bird use and behavior data to identify locations with reduced collision risk— may result in reduced fatalities (Smallwood et al. 2009~~). All~~), project proponents will conduct a siting process and prepare a micro-siting analysis to select turbine locations to minimize potential impacts on bird and bat species. ~~Proponents will utilize existing data as well as collect~~ The proponent has utilized existing data and collected new site-specific data as part of the siting analysis.

~~Project proponents~~ The project proponent will utilize currently available guidelines ~~such as~~ published by the Alameda County Scientific Review Committee (SRC) ~~guidelines~~ for siting wind turbines (Alameda County SRC 2010) and/or other currently available research or guidelines to conduct siting analysis. Additionally, project proponents will use the results of previous siting efforts to inform the analysis and siting methods as appropriate such that the science of siting continues to be advanced. All project proponents will collect field data that identify or confirm the behavior, utilization, and distribution patterns of affected avian and bat species prior to the installation of turbines. Project proponents will collect and utilize available existing information, including but not necessarily limited to: siting reports and monitoring data from previously installed projects; published use and abundance studies and reports; ~~and~~ topographic features known to increase collision risk (trees, riparian areas, water bodies, and wetlands~~).~~); and changes to the landscape caused by grading for the placement of turbine foundations.

Project proponents will also collect and utilize additional field data as necessary to inform the siting analysis for golden eagle. As required in 2020 Updated Mitigation Measure BIO-8a, surveys will be conducted to locate golden eagle nests within 2 miles of proposed project areas. Siting of turbines within 2 miles of an active or alternative golden eagle nest or active golden eagle territory will be based on a site-specific analysis of risk based on the estimated eagle territories, conducted in consultation with USFWS.

Project proponents will utilize methods (i.e., computer models) to identify dangerous locations for birds and bats based on site-specific risk factors informed by the information discussed above. The project proponents will compile the results of the siting analyses for each turbine and document these in the project-level APP, along with the specific location of each turbine. Consistent with past practice for previously approved repowering projects, the proponent shall submit the siting analysis for review and recommendations to the Alameda County Wind Repowering/Avian Protection Technical Advisory Committee, which includes representatives of the CDFW and the USFWS, prior to applying for any building or grading permit. The County planning director shall have the authority to approve or deny such permits on the basis of the siting analysis and the recommendations of the Technical Advisory Committee.

PEIR Mitigation Measure BIO-11c: Use turbine designs that reduce avian impacts

Use of turbines with certain characteristics is believed to reduce the collision risk for avian species. Project proponents will implement the design-related measures listed below.

- Turbine designs will be selected that have been shown or that are suspected to reduce avian fatalities, based on the height, color, configuration, or other features of the turbines.
- Turbine design will limit or eliminate perching opportunities. Designs will include a tubular tower with internal ladders; external catwalks, railings, or ladders will be prohibited.
- Turbine design will limit or eliminate nesting or roosting opportunities. Openings on turbines will be covered to prevent cavity-nesting species from nesting in the turbines.
- Lighting will be installed on the fewest number of turbines allowed by Federal Aviation Administration (FAA) regulations, and all pilot warning lights will fire synchronously. Turbine lighting will employ only red or dual red-and-white strobe, strobe-like, or flashing lights (U.S. Fish and Wildlife Service 2012a). All lighting on turbines will be operated at the minimum allowable intensity, flashing frequency, and quantity allowed by FAA (Gehring et al. 2009; U.S. Fish and Wildlife Service 2012a). Duration between flashes will be the longest allowable by the FAA.

PEIR Mitigation Measure BIO-11d: Incorporate avian-safe practices into design of turbine-related infrastructure

The project proponent will apply the following measures when designing and siting turbine-related infrastructure. These measures will reduce the risk of bird electrocution and collision.

- Permanent meteorological stations will avoid use of guy wires. If it is not possible to avoid using guy wires, the wires will be at least 4/0 gauge to ensure visibility and will be fitted with bird deterrent devices.
- All permanent meteorological towers will be unlit unless lighting is required by FAA. If lighting is required, it will be operated at the minimum allowable intensity, flashing frequency, and quantity allowed by FAA.
- To the extent possible, all power lines will be placed underground. However, lines may be placed aboveground immediately prior to entering the substation. All aboveground lines will be fitted with bird flight diverters or visibility enhancement devices (e.g., spiral damping devices). When lines cannot be placed underground, appropriate avian protection designs must be employed. As a minimum requirement, the collection system will conform

with the most current edition of the Avian Power Line Interaction Committee guidelines to prevent electrocutions.

- Lighting will be focused downward and minimized to limit skyward illumination. Sodium vapor lamps and spotlights will not be used at any facility (e.g., laydown areas, substations) except when emergency maintenance is needed. Lighting at collection facilities, including substations, will be minimized using downcast lighting and motion-detection devices. The use of high-intensity lighting; steady-burning or bright lights such as sodium vapor, quartz, or halogen; or other bright spotlights will be minimized. Where lighting is required it will be designed for the minimum intensity required for safe operation of the facility. Green or blue lighting will be used in place of red or white lighting.

PEIR Mitigation Measure BIO-11e: Retrofit existing infrastructure to minimize risk to raptors

Any existing power lines in a specific project area that are owned by the wind project operator and that are associated with electrocution of an eagle or other raptor will be retrofitted within 30 days to make them raptor-safe according to Avian Power Line Interaction Committee guidelines. All other existing structures to remain in a project area during repowering will be retrofitted, as feasible, according to specifications of PEIR Mitigation Measure BIO-11c prior to repowered turbine operation.

PEIR Mitigation Measure BIO-11f: Discourage prey for raptors

The project proponent will apply the following measures when designing and siting turbine-related infrastructure. These measures are intended to minimize opportunities for fossorial mammals to become established and thereby create a prey base that could become an attractant for raptors.

- Rodenticide will not be utilized on the project site to avoid the risk of raptors scavenging the remains of poisoned animals.
- Boulders (rocks more than 12 inches in diameter) excavated during project construction may be placed in aboveground piles in the project area so long as they are more than 500 meters (1,640 feet) from any turbine. Existing rock piles created during construction of first- and second-generation turbines will also be moved at least 500 meters (1,640 feet) from turbines.
- Gravel will be placed around each tower foundation to discourage small mammals from burrowing near turbines.

2020 Updated PEIR Mitigation Measure BIO-11g: Implement postconstruction avian fatality monitoring for all repowering projects

A postconstruction monitoring program will be conducted at each repowering project for a minimum of 3 years beginning on the commercial operation date (COD) of the project. Monitoring may continue beyond 3 years if construction is completed in phases. Moreover, if the results of the first 3 years indicate that baseline fatality rates (i.e., non-repowered fatality rates) are exceeded, monitoring will be extended until the average annual fatality rate has dropped below baseline fatality rates for 2 years, and to assess the effectiveness of adaptive management measures specified in Mitigation Measure BIO-11i. An additional 2 years of monitoring will be implemented at year 10 (i.e., the tenth anniversary of the COD). Project proponents will provide access to qualified third parties authorized by the County to conduct any additional monitoring after the initial 3-year monitoring period has expired and before and after the additional 2-year monitoring period, provided that such additional monitoring utilizes scientifically valid monitoring protocols.

A TAC will be formed to oversee the monitoring program and to advise the County on adaptive management measures that may be necessary if fatality rates substantially exceed those predicted for the project (as described below in Mitigation Measure BIO-11i). The TAC will have a standing meeting, which will be open to the public, every 6 months to review monitoring reports produced by operators in the program area. In these meetings, the TAC will discuss any issues raised by the monitoring reports and recommend to the County next steps to address issues, including scheduling additional meetings, if necessary.

The TAC will comprise representatives from the County (including one or more technical consultants, such as a biostatistician, an avian biologist, and a bat biologist), and wildlife agencies (CDFW, USFWS). Additional TAC members may also be considered (e.g., a representative from Audubon, a landowner in the program area, a representative of the operators) at the discretion of the County. The TAC will be a voluntary and advisory group that will provide guidance to the County Planning Department. To maintain transparency with the public, all TAC meetings will be open to the public, and notice of meetings will be given to interested parties.

The TAC will have three primary advisory roles: (1) to review and advise on project planning documents (i.e., project-specific APPs) to ensure that project-specific mitigation measures and compensatory mitigation measures described in this PEIR are appropriately and consistently applied, (2) to review and advise on monitoring documents (protocols and reporting) for consistency with the mitigation measures, and (3) to review and advise on implementation of the adaptive management plans.

Should fatality monitoring reveal that impacts exceed the baseline thresholds established in the PEIR, the TAC will advise the County on requiring implementation of adaptive management measures as described in Mitigation Measure BIO-11i. The County will have the decision-making authority, as it is the organization issuing the CUPs. However, the TAC will collaboratively inform the decisions of the County.

Operators are required to provide for avian use surveys to be conducted within the project area boundaries for a minimum of 30 minutes duration. Surveyors will be qualified and trained and subject to approval by the County.

Carcass surveys will be conducted at every turbine for projects with 20 or fewer turbines. For projects with more than 20 turbines, such surveys will be required at a minimum of 20 turbines, and a sample of the remaining turbines may be selected for carcass searches. The operator will be required to demonstrate that the sampling scheme and sample size are statistically rigorous and defensible. Where substantial variation in terrain, land cover type, management, or other factors may contribute to significant variation in fatality rates, the sampling scheme will be stratified to account for such variation. The survey protocol for sets and subsets of turbines, as well as proposed sampling schemes that do not entail a search of all turbines, must be approved by the County in consultation with the TAC prior to the start of surveys.

The search interval will not exceed 7 days for the minimum of 20 turbines to be surveyed; however, the search interval for the additional turbines (i.e., those exceeding the 20-turbine minimum) that are to be included in the sampling scheme may be extended up to 28 days or longer if recommended by the TAC.

The estimation of detection probability is a rapidly advancing field. Carcass placement trials, broadly defined, will be conducted to estimate detection probability during each year of monitoring. Sample sizes will be large enough to potentially detect significant variation by season, carcass size, and habitat type.

Operators will be required to submit copies of all raw data forms to the County annually, will supply raw data in a readily accessible digital format to be specified by the County, and will prepare raw data for inclusion as appendices in the annual reports. The intent is to allow the County to conduct independent analyses and meta-analyses of data across the APWRA, and to supply these data to the regulatory agencies if requested.

Annual reports submitted to the County will provide a synthesis of all information collected to date. Each report will provide an introduction; descriptions of the study area, methods, and results; a discussion of the results; and any suitable recommendations. Reports will provide raw counts of fatalities, adjusted fatality rates, and estimates of project-wide fatalities on both a per MW and per turbine basis.

2020 Updated PEIR Mitigation Measure BIO-11h: Compensate for the loss of avian species, including golden eagles, by contributing to conservation efforts

Discussion

Several options to compensate for impacts on avian species, including raptors as well as smaller birds, are currently available. Some are targeted to benefit certain species, but they may also have benefits for other species. For example, USFWS's Eagle Conservation Plan (ECP) Guidelines currently outline a compensatory mitigation strategy for golden eagles using the retrofit of high-risk power poles (poles known or suspected to electrocute and kill eagles). The goal of this ~~strategy~~strategy is to eliminate hazards for golden eagles. However, because the poles are also dangerous for other large raptors (e.g., red-tailed hawk, Swainson's hawk), retrofitting them can benefit such species as well as golden eagles.

Conversely, although the retrofitting of electrical poles may have benefits for large raptors, such an approach may provide minimal benefits for smaller birds such as American kestrel or tricolored blackbird. Consequently, additional measures would be required in an overall mitigation package to compensate for impacts on avian species in general.

The Secretary of the Interior~~ in the prior federal administration~~ issued Order 3330 in October 2013, outlining a "landscape-scale" approach to mitigation policies and practices of the U.S. Department of the Interior to provide for mutual benefit to multiple species when adopting strategies aimed at individual species, thereby benefitting the ecological landscape as a whole. The Order was intended for use by federal agencies, and thus the County was not required to take any particular action; however, the PEIR indicated confidence that such an approach would likely have the greatest mitigation benefits, especially when considering ongoing and long-term impacts from wind energy projects. In 2017, then Secretary of the Interior Ryan Zinke, acting on a presidential executive order, revoked Order 3330 and several other related environmental directives, primarily to ensure that federal policy did not burden the development or use of domestic oil, natural gas, coal, or nuclear energy resources. ~~However, the County still~~ However, while the current federal administration (under Secretary of the Interior Deb Haaland) is not known to have formally reversed the 2017 revocation of Order 3330, it is expected to have effectively restored it with a shift of priorities towards protection of ecological values while also accelerating the development of renewable energy production such as from wind, solar and geothermal projects. For this reason, the County considers it to be in its interest to promote policies that benefit one species that also have high potential for benefit to additional species, or to a whole ecological system or habitat.

With ~~these considerations~~ Order 3330 in mind, the PEIR outlined several options that are ~~currently~~ deemed available to compensate for impacts on avian species. The options discussed below are currently considered acceptable approaches to compensation for such impacts. Although not every option is appropriate for all species, it is hoped that as time proceeds, a more comprehensive approach to mitigation will be adopted to benefit a broader suite of species than might benefit from more species-specific measures. The County recognizes that the science of wind energy impacts on avifauna is continuing to evolve and that the suite of available compensation options may consequently change during implementation of approved projects.

Conservation Measures

To promote the conservation of avian species, project proponents will compensate for avian fatalities estimated within their project areas. Mitigation will be provided in 10-year increments, with the first increment based on the estimates (fatalities/MW/year and fatalities/ha RSA/year) provided in this analysis for existing repowered projects (Table 3.4-8). Each project proponent will conduct postconstruction fatality monitoring for at least 3 years beginning at project startup (date of commercial operation) and again for 2 years at year 10, as required under Mitigation Measure BIO-11g, to estimate the average number of birds taken each year by each individual project. The project proponent will compensate for this number of birds in subsequent 10-year increments for the life of the project (i.e., three 10-year increments) as outlined below. Mitigation Measure BIO-11g also requires additional fatality monitoring at year 10 of the project. The results of the first 3 years of monitoring and/or the monitoring at year 10 may lead to revisions of the estimated average number of birds taken, and mitigation provided may be adjusted accordingly on a one-time basis within each of the first two 10-year increments, based on the results of the monitoring required by Mitigation Measure BIO-11g, in consultation with the TAC.

Prior to the start of operations, project proponents will submit for County approval an avian conservation strategy, as part of the project-specific APP outlined in PEIR Mitigation Measure BIO-11a, outlining the estimated number of avian fatalities based on the number and type of turbines being constructed, and the type or types of compensation options to be implemented. Project proponents will use the avian conservation strategy to craft an appropriate strategy using a balanced mix of the options presented below, as well as considering new options suggested by the growing body of knowledge during the course of the project lifespan, as supported by a Resource Equivalency Analysis (REA) (see example in Appendix C4) or similar type of compensation assessment acceptable to the County that demonstrates the efficacy of proposed mitigation for impacts on avian species.

The County Planning Director, in consultation with the TAC, will consider, based on the REA, whether the proposed avian conservation strategy is adequate, including consideration of whether each avian mitigation plan incorporates a landscape-scale approach such that the conservation efforts achieve the greatest possible benefits. Compensation measures as detailed in an approved avian conservation strategy must be implemented within 1 year of the date of commercial operations. Avian conservation strategies will be reviewed and may be revised by the County every 10 years, and on a one-time basis in each of the two 10-year increments based on the monitoring required by 2020 Updated PEIR Mitigation Measure BIO-11g.

- **Retrofitting high-risk electrical infrastructure.** USFWS's ECP Guidelines outline a compensatory mitigation strategy using the retrofit of high-risk power poles (poles known or suspected to electrocute and kill eagles). USFWS has developed an REA (U.S. Fish and Wildlife Service 2013) as a tool to estimate the compensatory mitigation (number of retrofits) required for the take of eagles. The REA takes into account the current understanding of eagle life history factors, the effectiveness of retrofitting poles, the expected annual take, and the timing of implementation of the pole retrofits. The project proponents may need to contract with a utility or a third-party mitigation account (such as the National Fish and Wildlife Foundation) to retrofit the number of poles needed as demonstrated by a project-specific REA. If contracting directly, the project proponent will consult with utility companies to ensure that high-risk poles have been identified for retrofitting. Proponents will agree in writing to pay the utility owner/operator to retrofit the required number of power poles and maintain the retrofits for 10 years and will provide the County with documentation of the retrofit agreement. The first retrofits will be based on the estimated number of eagle fatalities as described above in this measure or as developed in the project-specific EIR for future projects. Subsequent numbers of retrofits required for additional 10-year durations will be based on the results of project-specific fatality monitoring as outlined in PEIR Mitigation Measure BIO-11g. If fewer eagle fatalities are identified through the monitoring, the number of future required retrofits may be reduced through a project-specific REA. Although retrofitting poles has not been identified as appropriate mitigation for other large raptors, they would likely benefit from such efforts, as they (particularly red-tailed and Swainson's hawks) constitute the largest non-eagle group to suffer electrocution on power lines (Avian Power Line Interaction Committee 2006).
- **Measures outlined in an approved Eagle Conservation Plan and Bird and Bat Conservation Strategy.** Project proponents may elect to apply for eagle incidental take permits from USFWS. The eagle incidental take permit process currently involves preparation of an ECP and a Bird and Bat Conservation Strategy (BBCS). The ECP specifies avoidance and minimization measures, advanced conservation practices, and compensatory mitigation for eagles—conditions that meet USFWS's criteria for issuance of a permit. The BBCS outlines measures being implemented by the applicant to avoid and minimize impacts on migratory birds, including raptors. If eagle incidental take permits are obtained by project proponents, those permit terms, including the measures outlined in the approved ECP and BBCS, may constitute an appropriate conservation measure for estimated take of golden eagles and other avian species, provided such terms are deemed by the County to be comparable to or more protective of birds than the other options listed herein.
- **Contribute to avian conservation efforts.** Project proponents will contribute funds, in an amount equal to the average cost to rehabilitate one raptor at the California Raptor Center, affiliated with the UC Davis School of Veterinary Medicine—which receives more than 200

injured or ill raptors annually (Stedman pers. comm.). The funds would be paid prior to commercial operation based on the projected/anticipated, worst-case raptor fatalities indicated in Table 3.4-8a, and for this purpose defined as 95 raptors per year, in 10-year increments to local and/or regional conservation efforts designed to protect, recover, and manage lands for raptors, or to conduct research involving methods to reduce raptor fatalities or increase raptor productivity. Ten-year installments are more advantageous than more frequent installments for planning and budgeting purposes.

The funds will be contributed to an entity or entities engaged in these activities, such as the East Bay Regional Park District and the Livermore Area Regional Park District. Conservation efforts may include constructing and installing nest boxes and perches, conducting an awareness campaign to reduce the use of rodenticide, and conducting research to benefit raptors and other birds. The specific conservation effort to be pursued will be submitted to the County for approval as part of the avian conservation strategy review process. The donation receipt will be provided to the County as evidence of payment.

The first contributions for any given project will be based on the estimated number of avian fatalities as estimated in this EIR. Funds for subsequent 10-year installments will be provided on the basis of the average annual avian fatality rates determined through postconstruction monitoring efforts, allowing for a one-time adjustment within each 10-year increment after the results of the monitoring efforts are available. If fewer avian fatalities are detected through the monitoring effort, the second installment amount may be reduced to account for the difference between the first estimated numbers and the monitoring results. In the event of such an adjustment, and on each 10-year anniversary, projected costs shall be adjusted for inflation (from the base amount described above) according to the consumer price index (CPI) through the remainder of the 10-year term or the subsequent 10-year term. Review shall occur at the time that monitoring reports are accepted by the Planning Director showing a change in total avian fatalities for the project. All avian species listed in Table 3.4-4 shall be accounted for in estimating the payment.

- **Contribute to regional conservation of avian habitat.** Project proponents may address regional conservation of habitat for raptors and other birds by funding the acquisition of conservation easements within the APWRA or on lands in the same eco-region outside the APWRA, subject to County approval, for the purpose of long-term regional conservation of raptor habitat. Lands proposed for conservation must provide habitat similar to and in area proportional to habitats on lands within the project site. Project proponents will fund the regional conservation and improvement of lands (through habitat enhancement, lead abatement activities, elimination of rodenticides, and/or other measures) using a number of acres equivalent to the conservation benefit of the avian recovery and conservation efforts described above, or as determined through a project-specific REA (see example REA in PEIR Appendix C4). The conservation lands must be provided for compensation of a minimum of 10 years of avian fatalities, as 10-year increments will minimize the transaction costs associated with the identification and conservation of lands, thereby increasing overall cost effectiveness. The conservation easements will be held by an organization whose mission is to purchase and/or otherwise conserve lands, such as The Trust for Public Lands, The Nature Conservancy, California Rangeland Trust, or the East Bay Regional Parks District. The project proponents will obtain approval from the County regarding the amount of conserved lands, any enhancements proposed to increase raptor and other avian habitat value, and the entity holding the lands and/or conservation easement.

- **Contribute to efforts benefitting eagles and other raptors.** In addition to the conservation of avian habitat, the project proponent will also contribute to additional efforts for the benefit of eagles and other raptors in an amount equal to $12,500/MW of installed capacity. The mitigation contribution is based on the per MW amount ($10,500/MW) established under the 2010 Settlement Agreement between NextEra Energy Resources and the California Attorney General, adjusted for inflation and rounded up to the nearest $100 increment. The funds will be used to support efforts that USFWS accepts as mitigation for an eagle take permit for the project. Such efforts may include, but are not limited to: retrofit of high-risk power poles; efforts that contribute to the regional management of eagle and raptor habitat; efforts that support the additional conservation of lands for the benefit of eagles and other raptors; and efforts that support the reduction of rodenticide use in wildlands, which can have negative effects on raptor populations.
- **Other Conservation Measures Identified in the Future.** As noted above, additional conservation measures for raptors and other birds may become available in the future. Conservation measures for avian species are currently being developed by USFWS and nongovernmental organizations (e.g., American Wind Wildlife Institute). Additional options for conservation could include purchasing credits at an approved mitigation bank, credits for the retirement of windfarms that are particularly dangerous to birds, the curtailment of prey elimination programs~~,~~ (e.g., ceasing the use of rodenticide use), and hunter-education programs that remove sources of lead from the environment. Under this option, the project proponent may make alternative ~~prop-osals~~ proposals to the County for conservation measures—based on an REA or similar compensation assessment—that the County may accept as mitigation if they are deemed by the County to be comparable to or more protective of raptor species than the other options described herein.

2020 Updated PEIR Mitigation Measure BIO-11i: Implement an avian adaptive management program

If fatality monitoring described in Mitigation Measure BIO-11g results in an estimate that exceeds the preconstruction baseline fatality estimates (i.e., estimates at the non-repowered turbines as described in this PEIR) for any focal species or species group (i.e., individual focal species, all focal species, all raptors, all non-raptors, all birds combined), project proponents will prepare a project-specific adaptive management plan within 2 months following the availability of the fatality monitoring results. These plans will be used to adjust operation and mitigation to the results of monitoring, new technology, and new research to ensure that the best available science is used to minimize impacts to below baseline. Project-specific adaptive management plans will be reviewed by the TAC, revised by project proponents as necessary, and approved by the County. The TAC will take current research and the most effective impact reduction strategies into account when reviewing adaptive management plans and suggesting measures to reduce impacts. The project-specific adaptive management plans will be implemented within 2 months of approval by the County. The plans will include a stepped approach whereby an adaptive measure or measures are implemented, the results are monitored for success or failure for a year, and additional adaptive measures are added as necessary, followed by another year of monitoring, until the success criteria are achieved (i.e., estimated fatalities are below the baseline). Project proponents should use the best measures available when the plan is prepared in consideration of the specific adaptive management needs. For example, if only one threshold is exceeded, such as golden eagle fatalities, the plan and measures used will target that species. As set forth in other agreements in the APWRA, project proponents may also focus adaptive management measures on individual or multiple turbines if those turbines are shown to cause a significantly disproportionate number of fatalities.

In general, the following types of measures will be considered by the TAC, in the order they are presented below; however, the TAC may recommend any of these or other measures that are shown to be successful in reducing the impact.

ADMM-1: Visual Modifications. The project proponent will paint a pattern on a proportion of the turbine blades. The proportion and the pattern of the blades to be painted will be determined by the County in consultation with the TAC. Previous laboratory work has shown that painting a turbine blade may reduce *motion smear*—the blurring of turbine blades due to rapid rotation that renders them less visible and hence more perilous to birds in flight (Hodos 2003). A test of blade painting, performed in Norway, suggests that the technique can reduce avian fatalities by 70% (May et al. 2020). Suggested techniques include painting blades with staggered stripes or painting one blade black. The project proponent will conduct fatality studies on a controlled number of painted and unpainted turbines. The project proponent will coordinate with the TAC to determine the location of the painted turbines, but the intent is to implement this measure in areas that appear to be contributing most to the high number of fatalities detected.

ADMM-2: Anti-Perching Measures. The County will consult with the TAC regarding the use of anti-perching measures to discourage bird use of the area. The TAC will use the most recent research and information available to determine, on a case-by–case basis, if anti-perching measures will be an effective strategy to reduce impacts. If determined to be feasible, antiperching devices will be installed on artificial structures, excluding utility poles, within 1 mile of project facilities (with landowner permission) to discourage bird use of the area.

ADMM-3: Prey Reduction. The project proponent will implement a prey reduction program around the most hazardous turbines. Examples of prey reduction measures may include changes in grazing practices to make the area less desirable for prey species, active reduction through direct removal of prey species, or other measures provided they are consistent with management goals for threatened and endangered species.

ADMM-4: Implementation of Experimental Technologies. Project proponents can deploy experimental technologies at their facilities to test their efficacy in reducing turbine-related fatalities. Examples may include, but are not limited to, visual deterrents, noise deterrents, and active radar systems.

ADMM-5: Turbine Curtailment. If postconstruction monitoring indicates patterns of turbine-caused fatalities—such as seasonal spikes in fatalities, topographic or other environmental features associated with high numbers of fatalities, fatalities related to proximity to raptor nesting sites (nest trees, lattice towers or burrowing owl colonies), or other factors that can potentially be manipulated and that suggest that curtailment of a specific turbine's operation would result in reducing future avian fatalities—the project operator will curtail operations of the offending turbine or turbines. Curtailment restrictions would be developed in coordination with the TAC and based on currently available fatality data, use data, and research.

ADMM-6: Cut-in Speed Study. Changes in cut-in speed could be conducted to see if changing cut-in speeds from 3 meters per second to 5 meters per second (for example) would significantly reduce avian fatalities. The proponent will coordinate with the TAC in determining the feasibility of the measure for the particular species affected as well as the amount of the change in the cut-in speed.

ADMM-7: Real-Time Turbine Curtailment. The project proponent can employ a real-time turbine curtailment program designed in consultation with the TAC. The intent would be to deploy a biologist to monitor onsite conditions and issue a curtailment order when raptors are near operating turbines. Alternatively, radar, video, or other monitoring measures could be deployed in place of a biological monitor if there is evidence to indicate that such a system would be as effective and more efficient than use of a human monitor.

ADMM-8: Condor Evaluation and Curtailment. On an annual basis, the project proponent will review the known distribution of the California condor, relative to the project area, by coordinating with USFWS, CDFW, and U.S. Geological Survey regarding data tracking condor movements, and will use this data to identify all condor overflights in the project area, as well as evaluating trends in condor use of neighboring areas. The project proponent will report their findings to the County. If those data show California condors flying over the project area, the project proponent will coordinate with USFWS and CDFW regarding the risk assessment, and if necessary, measures to minimize the risk of fatalities. These measures could include the use of regional electronic monitoring to inform project operators of condors flying into the area, with responses including curtailment or implementing a visual detection system to reduce risks to condors; other effective measures may also be proposed. Measures implemented would depend on the extent of condor use in the project area and the evaluation of the risk of a condor mortality. The project proponent will inform the County of discussions with USFWS and CDFW and efforts it will undertake to reduce the risk of condor mortality, if necessary.

Impact BIO-12: Potential mortality or disturbance of bats from roost removal or disturbance (less than significant with mitigation)

Some of the rock outcrops at the project site have crevices that may provide suitable roosting habitat for little brown bat, pallid bat, and other bats species that have been documented in the APWRA (western mastiff bat, silver-haired bat [night roosting only], Mexican free-tailed bat, big brown bat, or California myotis). Western red bat and hoary bat could roost in riparian habitat along Patterson Run Creek or in other groups of trees in the project site. Project impacts on rock outcrop habitat is provided in Table 3.4-6. No trees in the project site would be removed during construction. Potential effects on bat roosting habitat would be avoided or minimized through the implementation of mitigation measures from the PEIR.

Construction and maintenance of turbines could result in a temporary increase in noise and ground vibration during installation or removal of turbine generators and pads, which could disturb nearby active bat roosts. Several species of bat are sensitive to disturbance and may abandon flightless young, or they may simply not return to the roost once disturbed, resulting in the loss of that roost as habitat for the local population. Removal of a bat roost structure in a roost-limited habitat could result in the loss of a significant portion of the local bat population. These impacts would be significant. Implementation of 2020 Updated PEIR Mitigation Measure BIO-1b and PEIR Mitigation Measures BIO-3a, BIO-12a, and BIO-12b would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less than significant level because they include surveys to identify active bat roosts and potential roosts within 750 feet of construction activities and establish buffers and identify protection measures to minimize disturbance of active roosts near work areas.

No new mitigation is required.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-3a: Conduct preconstruction surveys for habitat for special-status wildlife species

No more than 3 years prior to ground-disturbing repowering activities, a qualified biologist (as determined by Alameda County) will conduct field surveys within decommissioning, repowering, and restoration work areas and their immediate surroundings to determine the presence of habitat for special-status wildlife species. The project proponent will submit a report documenting the survey results to Alameda County for review prior to conducting any repowering activities. The report will include the location and description of all proposed work areas, the location and description of all suitable habitat for special-status wildlife species, and the location and description of other sensitive habitats (e.g., vernal pools, wetlands, riparian areas). Additionally, the report will outline where additional species- and/or habitat-specific mitigation measures are required. This report may provide the basis for any applicable permit applications where incidental take may occur.

PEIR Mitigation Measure BIO-12a: Conduct bat roost surveys

Prior to development of any repowering project, a qualified bat biologist will conduct a roost habitat assessment to identify potential colonial roost sites of special-status and common bat species within 750 feet of the construction area. If suitable roost sites are to be removed or otherwise affected by the proposed 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 may be required. Surveys will 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). 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 may consist of both daylight surveys for signs of bat use and evening/night visit(s) to conduct emergence surveys or evaluate the status of night roosts. Survey timing should be adequate to account for individual bats or species that might not emerge until well after dark.

Methods and approaches for determining roost occupancy status should include a combination of the following components as the biologist deems necessary for the particular roost site.

- Passive and/or active acoustic monitoring to assist with species identification.
- Guano traps to determine activity status.
- Night-vision equipment.
- Passive infrared camera traps.

At the completion of the roost surveys, a report will be prepared documenting areas surveyed, methods, results, and mapping of high-quality habitat or confirmed roost locations.

PEIR Mitigation Measure BIO-12b: Avoid removing or disturbing bat roosts

- Active bat roosts will not be disturbed and will be provided a minimum buffer of 500 feet where preexisting disturbance is moderate or 750 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 CDFW. At a minimum, when an active maternity roost or hibernaculum is present within 750 feet of a construction site, a qualified biologist will conduct an initial assessment of the roost response to construction activities and will recommend buffer expansion if there are signs of disturbance from the roost.
- Structures (natural or artificial) showing evidence of significant bat use within the past year will be left in place as habitat wherever feasible. Should such a structure need to be removed or disturbed, CDFW will be consulted to determine appropriate buffers, timing and methods, and compensatory mitigation for the loss of the roost.
- All project proponents will provide environmental awareness training to construction personnel, establish buffers, and initiate consultation with CDFW if needed.
- Artificial night lighting within 500 feet of any roost will be shielded and angled such that bats may enter and exit the roost without artificial illumination and the roost does not receive artificial exposure to visual predators.
- Tree and vegetation removal will be conducted outside the maternity season (April 1–September 15) to avoid disturbance of maternity groups of foliage-roosting bats.
- If a maternity roost or hibernaculum is present within 500 feet of the construction site where preexisting disturbance is moderate or within 750 feet where preexisting disturbance is minimal, a qualified biological monitor will be onsite during groundbreaking activities.

Impact BIO-13: Potential for construction activities to temporarily remove or alter bat foraging habitat (less than significant with mitigation)

Construction of the repowering project could degrade bat foraging habitat by replacing vegetation with nonvegetated land cover types. Project construction would create a temporary increase in traffic, noise, and artificial night lighting in the program area, reducing the extent of landscape available for foraging. Overall, the project would result in the permanent loss of less than 1% and temporary disturbance of only 6% of the available foraging habitat on the project site. The loss of less than 1% of available foraging habitat at the project site is not expected to substantially reduce the availability of foraging habitat in the project region and will not adversely affect foraging bat species in the project vicinity. Up to 264 acres of annual grassland would be temporarily disturbed during project construction; however, implementation of PEIR Mitigation Measure BIO-5c would restore temporarily disturbed grasslands to pre-project conditions, and would reduce this impact to a less-than-significant level.

No additional mitigation is required.

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

Impact BIO-14: Turbine-related fatalities of special-status and other bats (significant and unavoidable)

As noted in the PEIR, resident and migratory bats flying in and through the project site may be killed by collision with wind turbine blades or other interaction with the wind turbine generators. Repowering at the project site would introduce increased fatality risk, particularly to migratory bats.

Extrapolating from existing fatality data and from trends observed at other wind energy facilities where fourth-generation turbines are in operation, it appears likely that fatalities would primarily be associated with wind speeds of less than 5–6 m/s; that fatalities would occur predominantly in the late summer to mid-fall migration period; that fatalities would consist mostly of migratory bats, particularly Mexican free-tailed bat and hoary bat; that fatalities would occur sporadically at other times of year; and that fatalities of one or more other species would occur in smaller numbers. It has been proposed that lighting of the operational turbines in accordance with Federal Aviation Administration requirements could affect bat fatalities. Artificial lighting in developed settings has been shown to have a variety of adverse effects on bat behaviors including foraging and commuting, emergence, roosting, breeding, and hibernation (Stone et al. 2015). However, the required lighting of wind turbines may result in reduced bat fatalities, based on prior studies that have either found no changes in fatalities between lighted and unlighted turbines, or a measurable reduction in fatalities at lighted turbines (Hein and Schirmacher 2016, and sources cited therein).

As discussed in Section 3.4.2 under *Methods for Analysis*, bat fatality detections were uncommon prior to the advent of using trained dogs in surveys; thus it is likely that bat fatality rates estimated from older studies, such as those used in the PEIR (i.e., Buena Vista, Diablo Winds, and the first 2 years of monitoring at Vasco Winds), substantially underestimated actual fatalities. We now have 3 years of monitoring data developed for Vasco Winds (using 7-day search intervals), 3 years for Golden Hills (using 7-day search intervals with trained dogs), and 1 year for Golden Hills North (using 7-day search intervals with trained dogs). The results clearly indicate a pattern of improved fatality detection in bats[8].

- Smallwood and Karas (2009) estimated a fatality rate of 0.263 fatality/MW/year derived from 2005–2007 monitoring at the APWRA.
- Monitoring at the Buena Vista project, using long search intervals and no use of dogs led to very low detection rates of 0.8 bats/year/MW or 2.6 bats/year/ha RSA (Tables 3.4-4 and 3.4-5; note there was no bat monitoring for the Diablo Winds project).
- Monitoring at the Vasco Wind project, using 7-day search intervals and no use of dogs, led to fatality rates of 3.2 bats/MW/year or 9.2 bats/ha RSA/year (Tables 3.4-4 and 3.4-5).
- Monitoring at the Golden Hills and Golden Hills North projects, using 7-day search intervals and trained dogs, led to fatality rates of 6.8-14.6 bats/MW/year or 15-32 bats/ha RSA/year (Tables 3.4-4 and 3.4-5).

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[8] The issue is somewhat more complicated in that the trend over time for repowered projects in the APWRA is to install larger, taller wind turbines. Such turbines pose an intrinsically greater risk to bats compared to non-repowered or smaller, shorter repowered turbines (Alameda Community Development Department 2014; Barclay et al. 2007; Hein and Schirmacher 2016), so more recent projects might have higher bat fatality rates as well has having higher fatality detection rates.

Based on this evidence, the Golden Hills and Golden Hills North monitoring is likely the most accurate available predictor of potential bat mortality for the proposed project. In this context, it is worth noting that at Golden Hills over 3 years, the annual fatality rates varied from 6.1 to 7.1 bats/MW/year or 14-16 bats/ha RSA/year, while at Golden Hills North fatality rates for 1 year were approximately twice as high at 15 bats/MW/year or 32 bats/ha RSA/year. This suggests that there may be a high level of site-to-site variation in bat fatality rates and, thus, that these data are of limited usefulness in attempting to predict bat fatality rates for the proposed project.

Smallwood and Bell (2019) note that even estimates derived using dogs and short survey intervals may substantially underestimate bat fatalities, since their observations indicate that direct observations of bat/turbine collisions would predict approximately four times the fatality rates detected using dogs, and they speculate that this could in part be due to crippling bias (injuries that subsequently prove fatal) or search radius bias (carcasses that fall far from the turbine). Thus, there are reasons to suspect that all of the bat fatality rate estimates shown in Tables 3.4-4 and 3.4-5 are underestimates, while there is no reason to suspect that they are overestimates.

The PEIR noted that “insufficient data are currently available to develop accurate fatality estimates for bats” (Alameda Community Development Department 2014:3.4-18). The fatality rates reported here serve to lessen the uncertainty in bat fatality estimates.

In view of the foregoing discussion of fatality rates, annual estimated bat fatalities in the project site are anticipated to be approximately 648 (on a MW basis) to 765 (on an RSA basis) fatalities per year, but potentially several times higher if Smallwood and Bell’s (2019) assessment of potential sampling bias is correct (Table 3.4-8). Of these numbers, approximately 25% would be hoary bats, approximately 69% would be Mexican free-tailed bats, and the remaining 6% would include a variety of other species.

The Mexican free-tailed bat is not a species of conservation concern, as it is extremely widespread and in most of its range is non-migratory. The hoary bat, however, is highly migratory, with a summer range that includes much of North America, and seasonal migrations to overwinter in southern California and Mexico (Cryan 2003). The species was early identified as the single most common bat fatality at wind farms at locations throughout the United States (Ellison 2012), both because it is a “tree bat” that is known to be attracted to forage at wind turbines (Arnett et al. 2016), and because it is highly migratory. Migrations in this species are not well understood, but at least some populations make very long migrations (Cryan et al. 2014b). California is geographically positioned between hoary bat populations in western Canada and the Pacific Northwest, and overwintering habitat in southern California and Mexico. Most hoary bat fatalities detected in the APWRA have occurred in the fall, during the southward bat migration, so it is likely that most hoary bat fatalities in the area involve migratory rather than resident bats, and this may also indicate that their spring migration has less exposure in the APWRA. It is thus likely that many of the fatalities observed at APWRA are derived from a large migratory population that summers north of the area.

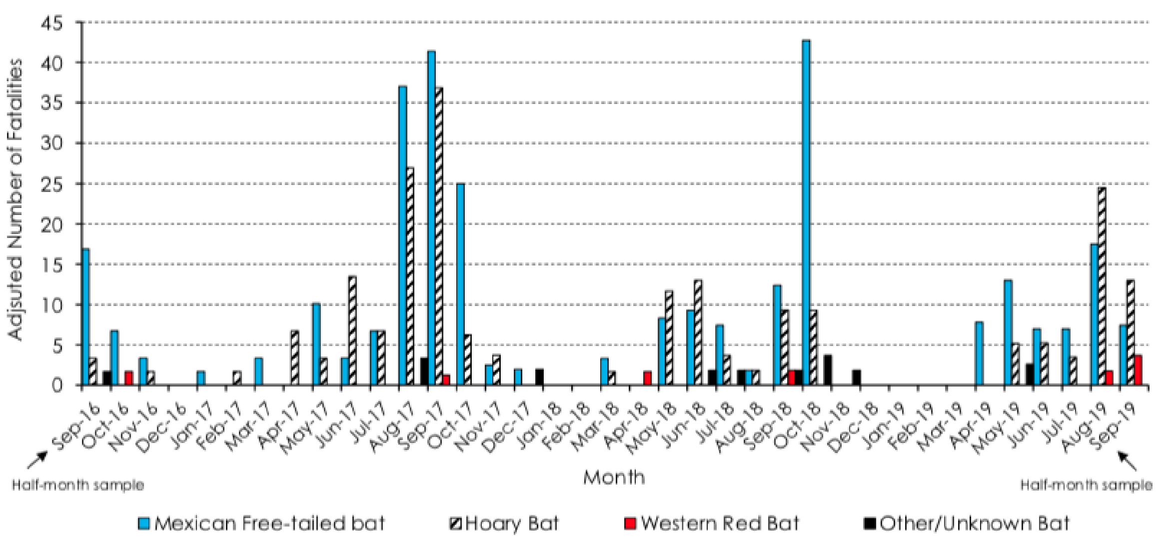
Frick et al. (2017) developed population models of hoary bats in North America and showed that, due to high mortality rates and low reproductive rates, continuation of current mortality rates associated with wind power facilities could “pose a substantial threat to migratory bats in North America,” with possible outcomes for the hoary bat including local extirpation. Data corroborating this proposition have been published by Rodhouse et al. (2019), who find evidence for region-wide summer declines of hoary bats in the Pacific Northwest (Washington and Oregon) between 2010 and 2018; they propose “the hypothesis that the longer duration and greater geographic extent of the wind energy stressor (collision and barotrauma) have impacted the species." It is thus possible that the proposed project could cause or contribute to declines in regional hoary bat populations.

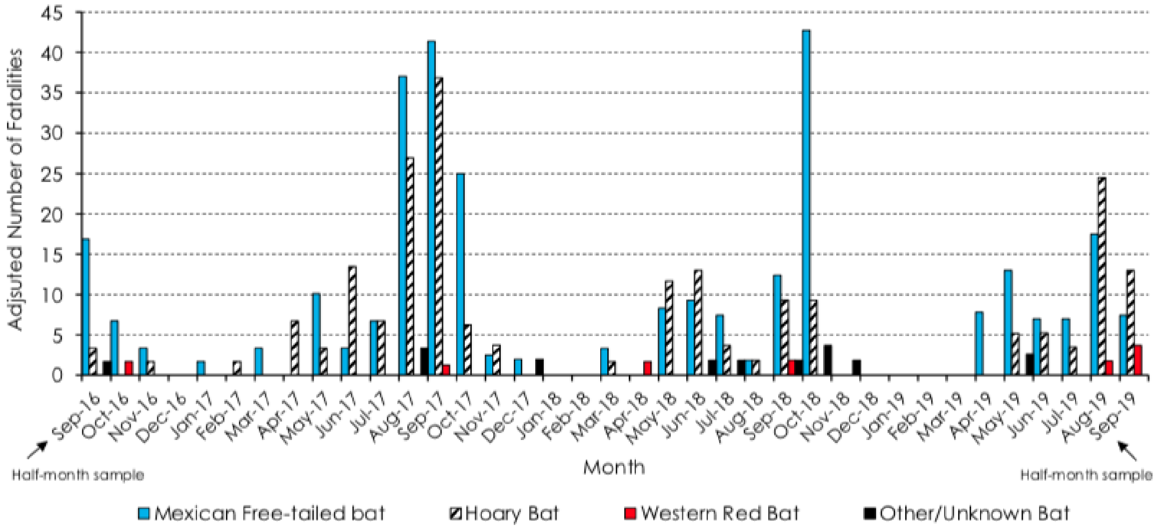
Bat fatalities in the APWRA show strong seasonal variation. Quantification of this is uncertain because both the probability of finding a carcass and the duration of carcass persistence also vary seasonally. In the 3 years of completed monitoring at Golden Hills, for instance, humans working with detection dogs found 60% of experimentally placed bat carcasses. The probability of successfully detecting a bat carcass was highest in fall, intermediate in spring, and lowest in winter and summer. In spring and summer, carcasses tend to be hidden by vegetation, while in winter they tend to be scavenged rapidly (H. T. Harvey & Associates 2020:iv). Also, at Golden Hills, bat fatality rates have shown substantial variability over time (Figure 3.4-4), with most fatalities tending to occur from August through October, but with variability from year to year as well as from species to species. Causes of this variability include random variation as well as factors such as weather and operational variability involving which turbines are active and for how long (H. T. Harvey & Associates 2020). Similar findings emerged from the first year of Golden Hills North monitoring, where

> Bat fatalities were uncommon during winter. From spring through fall, the fatality rate for Mexican free-tailed bats followed bimodal temporal pattern with peaks during spring migration (May/June) and fall migration (September/October). Hoary bat fatalities also peaked in fall but were proportionately less common in spring. Western red bat fatalities also were most common during the fall migration season (Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~2020a:37).

Thus, available data infer that bats generally show peak abundance in August, September, and October, with a relatively minor abundance peak in May and June, and few bats present at other times of the year (Figure 3.4-4).

Figure 3.4-4. Timing of bat fatalities observed during 3 years of monitoring at Golden Hills, from H. T. Harvey & Associates (2020)





Summary: The PEIR concluded that "Insufficient data are currently available to develop accurate fatality estimates for individual bat species," but subsequent analyses using more frequent and intensive surveys, and especially surveys using trained dogs and handlers, have produced fatality estimates that are both more confident and substantially larger; though, there are still reasons to suspect that observed fatality rates may be biased low. The PEIR described potential impacts on five species of bats, but noted that two species, Mexican free-tailed bats and hoary bats, were most vulnerable. Subsequent work has shown that these two species account for more than 90% of bat fatalities recorded in the APWRA (Brown et al. 2016; H. T. Harvey & Associates 2020; Great Basin Bird Observatory and H. T. Harvey & Associates ~~2020~~ 2020a). The PEIR noted that information available at the time indicated that bat collision risk increases substantially when old-generation turbines are replaced by newer, larger turbines, a finding corroborated by studies indicating that bat fatality rates increase with use of taller turbines. The PEIR further noted that "Turbines used in future repowering projects are likely to be similar in size to Vasco Winds turbines but much larger than the Diablo Winds and Buena Vista turbines in both overall size and rated nameplate capacity." As noted in this analysis, the larger nameplate capacity of the Mulqueeney turbines essentially results in a need for fewer turbines to meet a given nameplate capacity. Overall, the PEIR found that "Despite the high level of uncertainty in estimates of bat fatality rates, all available data suggest that repowering would result in a substantial increase in bat fatalities." The recently available information further supports this conclusion in the PEIR and does not alter its significance with regard to the proposed project, but it does provide further insight into bat use of the APWRA, particularly showing that bat fatalities are highly seasonal and primarily occur during the August to October fall migration.

While the PEIR set forth multiple measures to address bat mortality, it concluded that these measures would not reduce the impact to a less-than-significant level, because, as described in Impact BIO-14a-2 of the PEIR, "despite the high level of uncertainty in estimates of bat fatality rates, all available data suggest that repowering would result in a substantial increase in bat fatalities." This conclusion holds true for the project, and, although it remains difficult to estimate bat mortality rates with certainty, continued monitoring using techniques that are already well established, specifically, the use of trained dogs and their handlers, would contribute to the body of knowledge informing this effort, as noted in the recent H. T. Harvey & Associates (2020) monitoring report, the study of search effectiveness presented by Smallwood and Bell (2019), and multiple additional sources cited therein. Implementation of 2020 Updated PEIR Mitigation Measure BIO-14b and PEIR Mitigation Measures BIO-14a, and BIO-14c through BIO-14e would reduce significant impacts on bats but not to a less-than-significant level.

2020 Updated PEIR Mitigation Measure BIO-14a: Site and select turbines to minimize potential mortality of bats

The project proponent will use the best information available to site turbines and to select from turbine models in such a manner as to reduce bat collision risk. The siting and selection process will take into account bat use of the area (e.g., proximity to maternity colony sites, hibernacula, and cover types that provide foraging habitat for bats). Procedures followed should be consistent with guidance provided by the California guidelines for reducing impacts on birds and bats from wind energy development (California Energy Commission and California Department of Fish and Game 2007).

To generate site-specific "best information" to inform turbine siting and operation decisions, a bat habitat assessment and roost survey will be conducted in the project area to identify and map habitat of potential significance to bats, such as potential roost sites (trees and shrubs, significant rock formations, artificial structures) and water sources. Turbine siting decisions will incorporate relevant bat use survey data and bat fatality records published by other projects in the APWRA. Roost surveys will be carried out according to the methods described in PEIR Mitigation Measure BIO-12a.

Consistent with past practice for previously approved repowering projects, the proponent shall submit the siting analysis for review and recommendations to the Alameda County Wind Repowering/Avian Protection Technical Advisory Committee, which includes representatives of the CDFW and the USFWS, prior to applying for any building or grading permit. The County planning director shall have the authority to approve or deny such permits on the basis of the siting analysis and the recommendations of the Technical Advisory Committee.

2020 Updated PEIR Mitigation Measure BIO-14b: Implement postconstruction bat fatality monitoring program for all repowering projects

A scientifically defensible, postconstruction bat fatality monitoring program will be implemented to estimate actual bat fatalities and determine if additional mitigation is required. Bat-specific modifications to the 3-year postconstruction monitoring program described in PEIR Mitigation Measure BIO-11g, developed in accordance with California Energy Commission and California Department of Fish and Game (2007) will be implemented.

In addition to the requirements outlined in 2020 Updated PEIR Mitigation Measure BIO-11g, the following three bat-specific requirements will be added.

- Include on the TAC at least one biologist with significant expertise in bat research and wind energy impacts on bats.
- Perform postconstruction bat fatality monitoring using trained dogs with handlers. In order to optimize monitoring success, these efforts should also include searching to a maximum radius around wind turbines that includes all deposited carcasses, searching along transects spaced closely together, and searching frequently. Recognizing that most bat fatalities in the APWRA are recorded from September through November, it is appropriate to concentrate

search efforts during that period, while still maintaining some level of search effort throughout the year.

- Conduct bat acoustic surveys concurrently with fatality monitoring at the project site to estimate nightly, seasonal, or annual variations in relative activity and species use patterns, and to contribute to the body of knowledge on seasonal bat movements and relationships between acoustic bat activity and turbine fatality. Should emerging research support the approach, these data may be used to generate site-specific predictive models to increase the precision and effectiveness of mitigation measures (e.g., the season specific, multivariate models described by Weller and Baldwin 2011:11). Acoustic bat surveys will be designed, and data analysis conducted by qualified biologists with significant experience in acoustic bat survey techniques. Methods will be informed by the latest available guidelines (California Energy Commission and California Department of Fish and Game 2007), except where best available science supports technological or methodological updates. High-quality, sensitive acoustic equipment will be used to produce data of sufficient quality to generate species identifications. Survey design and methods will be scientifically defensible and will include, at a minimum, the following elements:
  - Acoustic detectors will be installed at multiple stations to adequately sample range of habitats at the project site for both resident and migratory bats. The number of detector arrays installed per project site will incorporate emerging research on the density of detectors required to adequately meet sampling goals and inform mitigation approaches (Weller and Baldwin 2011:10).
  - Acoustic detector arrays will sample multiple airspace heights including as close to the repowered rotor swept area as possible. Vertical structures used for mounting may be preexisting or may be installed for the project (e.g., temporary or permanent meteorological towers).
  - Surveys will be conducted such that data are collected continuously from early July to early November to cover the activity transition from maternity to migration season and determine if there is elevated activity during migration. Survey season may be adjusted to more accurately reflect the full extent of the local migration season and/or season(s) of greatest local bet fatality risk, if scientifically sound data support doing so.
  - Anticipated adaptive management goals, such as determining justifiable timeframes to reduce required periods of cut-in speed adjustments, will be reviewed with the TAC and incorporated in designing the acoustic monitoring and data analysis program.

Modifications to the fatality search protocol will be implemented to obtain better information on the number and timing of bat fatalities (e.g., Johnston et al. 2013:85). Modifications will include decreases in the transect width and search interval for a period of time coinciding with high levels of bat mortality, i.e., the fall migration season (roughly August to early November, or as appropriate in the view of the TAC). The nature of bat-specific transect distance and search intervals will be determined in consultation with the TAC and will be guided by scientifically sound and pertinent data on rates of bat carcass detection at wind energy facilities (e.g., Johnston et al. 2013:54–55) and site-specific data from APWRA repowering project fatality monitoring programs as these data become available.

Other methods to achieve the goals of the bat fatality monitoring program while avoiding prohibitive costs may be considered subject to approval by the TAC, if these methods have been peer reviewed and evidence indicates the methods are effective. For example, if project proponents wish to have the option of altering search methodology to a newly developed method, such as searching only roads and pads, a statistically robust field study to index the results of the methodology against standard search methods will be conducted concurrently to ensure site-specific, long-term validity of the new methods.

Finally, detection probability trials will utilize bat carcasses to develop bat-specific detection probabilities. Care should be taken to avoid introducing novel disease reservoirs; such avoidance will entail using onsite fatalities or using carcasses obtained from within a reasonably anticipated flight distance for that species.

PEIR Mitigation Measure BIO-14c: Prepare and publish annual monitoring reports on the findings of bat use of the project area and fatality monitoring results

Annual reports of bat use results and fatality monitoring will be produced within 3 months of the end of the last day of fatality monitoring. Special-status bat species records will be reported to CNDDB.

2020 Updated PEIR Mitigation Measure BIO-14d: Develop and implement a bat adaptive management plan

In concert with 2020 Updated PEIR Mitigation Measure BIO-14b, the project proponent will develop adaptive management plans to ensure appropriate, feasible, and current incorporation of emerging information. The goals of the adaptive management plans are to ensure that the best available science and emerging technologies are used to assess impacts on bats, and that impacts are minimized to the greatest extent possible while maximizing energy production.

The project-specific adaptive management plans will be used to adjust operation and mitigation to incorporate the results of project area monitoring and new technology and research results when sufficient evidence exists to support these new approaches. These plans will be reviewed by the TAC and approved by the County. All adaptive management measures (ADMMs) will be implemented within a reasonable timeframe. Based on fatality rates recorded at Golden Hills and Golden Hills North, it is reasonably certain that the threshold fatality rate identified in the PEIR of 3.207 bats/MW/year will be exceeded at the proposed project[9]. For this reason, ADMM-7 ~~must~~ will be implemented at the commencement of project operations. If ADMM-7 is not successful in reducing bat fatalities to below threshold levels, ADMM-8 or ADMM-9 will be implemented within a timeframe sufficient to allow the measures to take effect in the first fall migration season following the year of monitoring in which the adaptive management threshold was crossed. The ADMMs may be modified by the County in consultation with the TAC to take into account current research, site-specific data, and the most effective impact reduction strategies. ADMMs will include a scientifically defensible, controlled research component and minimum post-implementation monitoring time to evaluate the effectiveness and validity of the measures.

[9] The PEIR identified predicted total fatality rates of 1.679 fatalities/MW/year from the Vasco Winds repowering project. That fatality rate has been revised upwards to 3.207 fatalities/MW/year, taking into account the correction noted on page 3.4-69 of this Final SEIR.

The TAC may also direct implementation of adaptive management measures for other appropriate reasons, such as an unexpectedly and markedly high fatality rate observed for any bat species, or special-status species being killed in unexpectedly high numbers.

ADMMs for bats may be implemented using a stepped approach until necessary fatality reductions are reached, and monitoring methods must be revised as needed to ensure accurate measurement of the effectiveness of the ADMMs. Additional ADMMs for bats should be developed as new technologies or science supports doing so.

ADMM-7: Seasonal Turbine Cut-in Speed Increase. Cut-in speed increases offer the most promising and immediately available approach to reducing bat fatalities at fourth-generation wind turbines. Reductions in fatalities of as much as 93% have been observed when increasing modern turbine cut-in speeds (Good et al. 2012:iii). A recent study in the APWRA documented significant reductions in fatalities using curtailment during the peak migration period (Smallwood and Bell 2019). Work at a site in Wisconsin has shown that a site-specific, real-time curtailment algorithm using wind speed and bat activity information (referred to as "smart-curtailment") can yield 74-92% fatality reductions at a 3.2% cost in revenue from the turbines (Hayes et al. 2019). Other curtailment studies, also performed in sites outside the APWRA, have shown comparable effectiveness (e.g. Hein et al. 2014). The optimal cut-in speed increase is not yet well developed, and may vary between sites or regions, however most current research points to significant benefits using a ~~5.0 m/s~~ cut in speed change~~.~~ of at least 5.0 m/s, with greater cut-in speed increases yielding improved benefit (Hayes et al. 2019).

Cut-in speed increases will be implemented as outlined below, with effectiveness assessed annually.

- Beginning with initial project operations, the project proponent will observe a cut-in speed of 5.0 m/s from sunset to sunrise from August 1 through October 31, which corresponds to the peak bat migration season in the APWRA. This measure shall apply for the first three full years of project operations.
- If, after the first three full years of project operations, fatalities are still exceeding established thresholds, the project proponent will:
    - increase the cut in speed in 0.5 m/s increments (up to a maximum of a 6.0 m/s cut in speed change), or
    - implement an additional 1-month spring cut in speed change to 5.0 m/s (with the timing to be determined based on the results of the initial 3 years of fatality monitoring), or
    - a combination of cut in speed increases and the spring cut in speed change.
- At any time following the end of the first three full years of project operations, the project proponent may request modifications to the initial operational requirements, including a changed cut-in speed or a change in the dates of curtailment~~.~~, or to implement a smart-curtailment operations regime. The project proponent must present evidence in support of such changes, including evidence from fatality monitoring during the first three years of project monitoring, acoustic survey or other evidence documenting bat activity during the migration season, and such other evidence as the project proponent deems relevant. Should resource agencies and the TAC find there is sufficient evidence to authorize the proposed changes, the supporting evidence will be documented for the public record and the revised operational requirements may be implemented.

- When the project proponent requests a modification of operational requirements, the TAC shall also consider whether evidence from the APWRA or other sites supports the institution of additional requirements to further minimize bat fatalities. Such requirements may include further cut-in speed increases or changes to the timing or duration of curtailment.
- The project proponent may request exceptions to cut-in speed increases for particular weather events or wind patterns if substantial evidence is available from onsite acoustic or other monitoring to support such exceptions (i.e., all available literature and onsite surveys indicate that bat activity ceases during specific weather events or other predictable conditions).

~~ADMM-8~~ ADMM-8: Acoustic Deterrents. The project proponent shall present to the TAC a proposal for the evaluation of acoustic deterrents to reduce bat fatalities. Any such proposal shall incorporate a paired study in which at least 12 operational turbines are subject to monitoring under 2020 Updated PEIR Mitigation Measure BIO-14b, with half of the turbines carrying acoustic deterrents and half reserved as a control group. The study shall at a minimum include one spring and one fall migration season. The acoustic deterrents shall be of a design similar to those described by Weaver et al. (2020), who demonstrated bat fatality rate reductions of up to 78% for hoary bat, which is the second-most-commonly killed bat documented in surveys at the APWRA. Based on the results of this study the TAC may call for permanent implementation of acoustic deterrents on all project turbines.

ADMM-9: Emerging Technology as Mitigation. The project proponent may request, with consultation and approval from agencies, replacement or augmentation of cut-in speed increases with developing technology or another mitigation approach that has been proven to achieve similar bat fatality reductions.

The project proponent may also request the second tier of adaptive management to be the adoption of a promising but not fully proven technology or mitigation method. These requests are subject to review and approval by the TAC and must include a controlled research component designed by a qualified principal investigator so that the effectiveness of the method may be accurately assessed.

Some examples of such emerging technologies and research areas that could be incorporated in adaptive management plans are listed below.

- ~~The use of acoustic deterrents (Arnett et al. 2013:1).~~
- The use of altitude-specific radar, night vision and/or other technology allowing bat use monitoring and assessment of at-risk bat behavior (Johnston et al. 2013: 90-91) if research in these areas advances sufficiently to allow effective application of these technologies.
- Application of emerging peer-reviewed studies on bat biology (such as studies documenting migratory corridors or bat behavior in relation to turbines) that support specific mitigation methods.

PEIR Mitigation Measure BIO-14e: Compensate for expenses incurred by rehabilitating injured bats

The cost of reasonable, licensed rehabilitation efforts for any injured bats taken to wildlife care facilities from the program area will be assumed in full by project proponents.

Impact BIO-15: Potential for road infrastructure upgrades to result in adverse effects on alkali meadow (no impact)

No alkali meadow, which is a non-wetland habitat type, is present at the project site; therefore, project construction activities, including road infrastructure upgrades, would not result in effects on alkali meadow habitat. There would be no impact.

Impact BIO-16: Potential for road and electrical infrastructure upgrades to result in adverse effects on riparian habitat (less than significant with mitigation)

Riparian habitats, which are also wetlands that qualify as waters of the United States and waters of the state, are present at the project site. Access road expansion may temporarily affect riparian habitat (see Table 3.4-6), but no permanent effects on riparian habitats are anticipated. ~~Horizontal directional drilling (HDD)~~HDD methods may be used to avoid the surface disturbance of some aquatic habitats and also avoid riparian habitat during the installation of electrical infrastructure; however, the exact locations where HDD may be used are not currently known. Consequently, impacts on riparian habitats due to installation of electrical infrastructure are assumed to potentially occur, but may ultimately be less than those described. As described in Chapter 2, *Project Description*, an IRCP would be prepared and implemented to ensure that any inadvertent release of drilling fluids are contained and cleaned up immediately to avoid and minimize potential impacts on riparian habitats.

Additionally, some activities could have indirect effects (not quantified) on riparian habitats through potential changes in hydrology and water quality if the activities are conducted near streams and/or associated riparian habitats. Indirect effects could involve altered hydrology or runoff of sediment and other substances during road construction activities. Some effects, such as those due to runoff, would be avoided and minimized through implementation of erosion control BMPs and ~~postconstruction~~ postconstruction reclamation. Installation of new and upgraded culverts would maintain existing hydrology.

Temporary loss of riparian habitat as a result of direct fill would be a substantial adverse effect on a sensitive natural community that is regulated by CDFW, USACE, and the Regional Water Board. This would be a significant impact. However, implementation of 2020 Updated PEIR Mitigation Measures BIO-1b and PEIR Mitigation Measures BIO-1e ~~and~~, BIO-16, and WQ-1 would reduce this impact to a ~~level~~ less-than-significant level. These measures would implement practices to avoid impacts where feasible on sensitive natural communities, including wetlands and streams, present in the areas of proposed ground disturbance, or minimize the impacts if complete avoidance is not feasible. Avoidance BMPs would include training of construction personnel, installation of exclusion fencing, water quality protection and erosion control, and monitoring of the BMP implementation around riparian habitats. Where avoidance is infeasible, compensatory mitigation would ensure there would be no net loss of riparian habitats by on-site restoration. No new mitigation measures are proposed.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-16: Compensate for the loss of riparian habitat

If riparian habitat is filled or removed as part of a project, the project proponent will compensate for the loss of riparian habitat to ensure no net loss of habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with state and federal agencies (CDFW, USFWS, USACE). The compensation will be at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled) and may be a combination of onsite restoration/creation, offsite restoration, and mitigation credits. A restoration and monitoring plan will be developed and implemented. The plan will describe how riparian habitat will be created and monitored.

Impact BIO-17: Potential for ground-disturbing activities to result in direct adverse effects on common habitats (less than significant)

Ground-disturbing activities would result in the permanent loss of common habitats as a result of constructing new permanent facilities and the temporary loss of common habitats as a result of constructing temporary facilities and landscape reclamation. These activities would create minor changes in total acreage of common habitats at the project site, primarily in the nonnative annual grassland plant community.

All lands temporarily disturbed by infrastructure installation would be returned to preproject conditions. At each reclamation site, the topography would be graded to match the contours of the natural surrounding landscape, stabilized, reseeded with an appropriate seed mixture, and allowed to become revegetated without assistance. Reclamation activities would be guided by a reclamation plan developed in coordination with the County and other applicable agencies.

This impact would be less than significant. No mitigation is required.

Impact BIO-18: Potential for road infrastructure upgrades to result in adverse effects on wetlands and streams (less than significant with mitigation)

Wetlands and streams, including alkali wetlands, ponds, intermittent streams, and ephemeral streams, occur at the project site. Existing facilities, particularly the access roads, may cross or occur adjacent to these aquatic resources, and construction activities that result in ground disturbance (including temporary fill and extension of culverts and installation of underground electrical collection lines) could directly or indirectly affect wetlands and streams that qualify as waters of the United States and waters of the state. Construction and maintenance activities would not directly affect any freshwater marsh, scrub-shrub wetland, or vernal pool habitats in the project site.

Construction of turbines, the power collection system, the temporary construction area, and access road widening have the potential to permanently affect alkali wetland, pond, and intermittent stream (see Table 3.4-6). Temporary impacts could occur in these habitats, as well as in ephemeral stream (see Table 3.4-6). HDD methods may be used to avoid the surface disturbance of some aquatic habitats; however, the exact locations where HDD may be used are not currently known.

Consequently, impacts on alkali wetland, pond, intermittent stream, and ephemeral stream habitats are assumed to potentially occur, but may ultimately be less than those described. As described in Chapter 2, *Project Description*, an IRCP would be prepared and implemented to ensure that any inadvertent release of drilling fluids are contained and cleaned up immediately to avoid and minimize potential impacts on aquatic habitats.

Additionally, some activities would have indirect effects (not quantified) on some wetlands and streams through potential changes in hydrology and water quality if the activities are conducted near aquatic habitats. Indirect effects could involve altered hydrology or runoff of sediment and other substances during road construction activities. Some effects, such as those due to runoff, would be avoided and minimized through implementation of erosion control BMPs and postconstruction reclamation. Installation of new and upgraded culverts would maintain existing hydrology.

Permanent and temporary loss of on alkali wetland, pond, intermittent stream, and ephemeral stream habitats from direct fill would be a substantial adverse effect on wetlands and streams that are regulated by USACE and the Regional Water Board. This would be a significant impact. However, implementation of 2020 Updated PEIR Mitigation Measures BIO-1b and BIO-18 and PEIR Mitigation ~~Measure~~ Measures BIO-1e and WQ-1 would reduce this impact to a level less-than-significant level. These measures would implement practices to avoid impacts where feasible on sensitive natural communities, including wetlands and streams, present in the areas of proposed ground disturbance, or minimize the impacts if complete avoidance is not feasible. Avoidance BMPs would include training of construction personnel, installation of exclusion fencing, water quality protection and erosion control, and monitoring of the BMP implementation around alkali wetlands, ponds, intermittent streams, and ephemeral streams. Where avoidance is infeasible, compensatory mitigation would ensure there would be no net loss of alkali wetland, pond, intermittent stream, and ephemeral stream habitats by onsite and/or offsite restoration of these habitats. No new mitigation measures are proposed; however, updates were made to PEIR Mitigation Measure BIO-18 to include the Regional Water Board as a state agency with which to coordinate. Due to the revisions of the federal Navigable Water Rule, more aquatic features at the project site could be regulated by the Regional Water Board as waters of the state.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

2020 Updated PEIR Mitigation Measure BIO-18: Compensate for the loss of wetlands and streams

If wetlands or streams are filled or disturbed as part of a project, the project proponent will compensate for the loss to ensure no net loss of habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with state and federal agencies (CDFW, USFWS, USACE, Regional Water Board). The compensation will be at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled) and may be a combination of onsite restoration/creation, offsite restoration, and mitigation credits. A restoration and monitoring plan will be developed and implemented. The plan will describe how wetlands and streams will be created and monitored.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact BIO-19: Potential impact on the movement of any native resident or migratory wildlife species or established native resident or migratory wildlife corridors, and the use of native wildlife nursery sites (significant and unavoidable)

Many common wildlife species (e.g., ground squirrels, voles, deer, coyote, raccoon, skunk) and special-status wildlife species discussed above are likely to occur in and move through the project site. Construction activities associated with the project and fencing of work areas may temporarily impede wildlife movement through the work area or cause animals to travel longer distances to avoid the work area. This could result in higher energy expenditure and increased susceptibility to predation for some species and is a potentially significant impact. Because the construction period for the project would be up to 7 months, it would likely encompass the movement/migration period for some species (e.g., California tiger salamander movement to/from breeding ponds). In particular, smaller animals, whose energy expenditures to travel around or avoid the area would be greater than for larger animals, could be more severely affected. Upon completion of the project, the wind turbines would be spaced apart and would not be a barrier to on-the-ground wildlife movement. As discussed above for special-status species, the project has the potential to affect native wildlife nursery sites (i.e., breeding areas). Because common species may also use these breeding areas, they may also be affected by the project. Impacts on breeding habitat for common wildlife species could reduce local populations and would constitute a significant impact. Implementation of 2020 Updated PEIR Mitigation Measures BIO-1b, BIO-5a, BIO-8a, BIO-8b, and BIO-10a, and PEIR Mitigation Measures BIO-1e, BIO-3a, BIO-5c, ~~BIO-7a,~~ and BIO-~~8b~~7a would avoid and minimize potential impacts on wildlife nursery areas for special-status and common wildlife species and would reduce this impact to a less-than-significant level.

As discussed above, the operation of wind turbines after repowering would adversely affect raptors, other birds, and bats migrating through and wintering at the project site because they could be injured or killed if they fly through the rotor plane of operating wind turbines. As discussed above, this would be a significant and unavoidable impact. Implementation of 2020 Updated PEIR Mitigation ~~Measure~~ Measures BIO-11i and BIO-11b, and PEIR Mitigation Measures ~~BIO-11b,~~ BIO-11c, BIO-11d, BIO-11e, BIO-12a, BIO-12b, BIO-14a, and BIO-14d would reduce this impact, but not to a less-than-significant level. Accordingly, this impact would be significant and unavoidable.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-3a: Conduct preconstruction surveys for habitat for special-status wildlife species

2020 Updated PEIR Mitigation Measure BIO-5a: Implement best management practices to avoid and minimize effects on special-status amphibians

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

PEIR Mitigation Measure BIO-7a: Implement best management practices to avoid and minimize effects on special-status reptiles

2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential impacts on special-status and non–special-status nesting birds and raptors

2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl

2020 Updated PEIR Mitigation Measure BIO-10a: Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger

2020 Updated PEIR Mitigation Measure BIO-11b: Site turbines to minimize potential mortality of birds

PEIR Mitigation Measure BIO-11c: Use turbine designs that reduce avian impacts

PEIR Mitigation Measure BIO-11d: Incorporate avian-safe practices into design of turbine-related infrastructure

PEIR Mitigation Measure BIO-11e: Retrofit existing infrastructure to minimize risk to raptors

2020 Updated PEIR Mitigation Measure BIO-11i: Implement an avian adaptive management program

PEIR Mitigation Measure BIO-12a: Conduct bat roost surveys

PEIR Mitigation Measure BIO-12b: Avoid removing or disturbing bat roosts

2020 Updated PEIR Mitigation Measure BIO-14a: Site and select turbines to minimize potential mortality of bats

2020 Updated PEIR Mitigation Measure BIO-14d: Develop and implement a bat adaptive management plan

Impact BIO-20: Conflict with local plans or policies (less than significant with mitigation)

The Alameda County East County Area Plan (ECAP) encourages the preservation of areas known to support special-status species and no net loss of seasonal wetlands. Loss of special-status species and their habitat (Impacts BIO-1 through BIO-14) and loss of existing wetlands and streams (Impact BIO-18) as a result of implementing the project would be in conflict with these policies. This impact would be significant; however, implementation of 2020 Updated PEIR Mitigation Measures BIO-1b, BIO-5a, BIO-8a, BIO-8b, BIO-10a, BIO-11h, BIO-11i and BIO-18, and PEIR Mitigation Measures BIO-1a, BIO-1c through BIO-1e, BIO-2, BIO-3a, BIO 5b, BIO-5c, BIO-6, BIO-7a, BIO-~~8b, BIO-~~9, BIO-10b, BIO-11a through BIO-11g, BIO-12b, BIO-14a, and BIO-14d would reduce this impact to a less-than-significant level. These measures would be effective because they would require the project applicant to minimize impacts on habitat for special-status species and compensate for the permanent loss of suitable habitat, as well as ensure that any impacts on wetlands and streams are compensated for to ensure no net loss of habitat functions and values.

PEIR Mitigation Measure BIO-1a: Conduct surveys to determine the presence or absence of special-status species

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1c: Avoid and minimize impacts on special-status plant species by establishing activity exclusion zones

PEIR Mitigation Measure BIO-1d: Compensate for impacts on special-status plant species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-2: Prevent introduction, spread, and establishment of invasive plant species

PEIR Mitigation Measure BIO-3a: Implement measures to avoid, minimize, and mitigate impacts on vernal pool branchiopods and curved-foot hygrotus diving beetle

2020 Updated PEIR Mitigation Measure BIO-5a: Implement best management practices to avoid and minimize effects on special-status amphibians

PEIR Mitigation Measure BIO-5b: Compensate for loss of habitat for special-status amphibians

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

PEIR Mitigation Measure BIO-6: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed

PEIR Mitigation Measure BIO-7a: Implement best management practices to avoid and minimize effects on special-status reptiles

2020 Updated PEIR Mitigation Measure BIO-8a: Implement measures to avoid and minimize potential impacts on special-status and non–special-status nesting birds and raptors

2020 Updated PEIR Mitigation Measure BIO-8b: Implement measures to avoid and minimize potential impacts on western burrowing owl

PEIR Mitigation Measure BIO-9: Compensate for the permanent loss of foraging habitat for western burrowing owl

2020 Updated PEIR Mitigation Measure BIO-10a: Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger

PEIR Mitigation Measure BIO-10b: Compensate for loss of suitable habitat for San Joaquin kit fox and American badger

PEIR Mitigation Measure BIO-11a: Prepare a project-specific avian protection plan

2020 Updated PEIR Mitigation Measure BIO-11b: Site turbines to minimize potential mortality of birds

PEIR Mitigation Measure BIO-11c: Use turbine designs that reduce avian impacts

PEIR Mitigation Measure BIO-11d: Incorporate avian-safe practices into design of turbine-related infrastructure

PEIR Mitigation Measure BIO-11e: Retrofit existing infrastructure to minimize risk to raptors

PEIR Mitigation Measure BIO-11f: Discourage prey for raptors

PEIR Mitigation Measure BIO-11g: Implement postconstruction avian fatality monitoring for all repowering projects

2020 Updated PEIR Mitigation Measure BIO-11h: Compensate for the loss of raptors and other avian species, including golden eagles, by contributing to conservation efforts

2020 Updated PEIR Mitigation Measure BIO-11i: Implement an avian adaptive management program

PEIR Mitigation Measure BIO-12a: Conduct bat roost surveys

PEIR Mitigation Measure BIO-12b: Avoid removing or disturbing bat roosts

2020 Updated PEIR Mitigation Measure BIO-14a: Site and select turbines to minimize potential mortality of bats

2020 Updated PEIR Mitigation Measure BIO-14d: Develop and implement a bat adaptive management plan

2020 Updated PEIR Mitigation Measure BIO-18: Compensate for the loss of wetlands and non-wetland waters

Impact BIO-21: Conflict with provisions of an adopted HCP/NCCP or other approved local, regional, or state habitat conservation plan (no impact)

There are no adopted HCP/NCCPs applicable to the project site. The EACCS, while not a formal HCP, provides guidance for the project planning and permitting process to ensure that impacts are offset in a biologically effective manner. As noted above, the mitigation measures set forth in the PEIR and adopted for this SEIR are based on measures from the EACCS, with some modifications and additions. Because there are no adopted HCP/NCCPs for the project site and the project would not conflict with the EACCS, there would be no impact.

Impact BIO-22: Potential disturbance or mortality of western bumble bee (less than significant with mitigation)

Potential effects on western bumble bee were not addressed in the PEIR because the species was not a candidate for state listing at the time that the PEIR was prepared.

Western bumble bee has the potential to be present in areas of flowering plants that provide a nectar and pollen food source. The extent of flowering plants within nonnative annual grassland at the project site has not been determined. It is expected that higher concentrations of flowering plants are present within low-lying portions of the project site, compared to the hilltops and ridgelines where new turbines are proposed. The higher elevation areas at the project site are exposed to high winds and tend to be dryer, representing a harsher environment for the growth of annual flowering plants, as well as foraging bees. Therefore, there is a low potential for western bumble bees to occupy areas where turbines are proposed. Suitable foraging habitat for western bumble bees could be present along existing and proposed new access roads since many of these occur in low-lying areas. Overall, there is a moderate potential for western bumble bee to forage and nest along existing access roads proposed for widening and along proposed new access roads.

Direct and indirect impacts on western bumble bee would be significant because the project could reduce the local population of a species that is a state candidate for listing as endangered and is considered locally rare. Implementation of 2020 Updated PEIR Mitigation Measures BIO-1b, PEIR Mitigation Measures BIO-1e and BIO-5c, and 2020 New Mitigation Measures BIO-22a and 22b would reduce this impact to a less-than-significant level. These measures would be effective in reducing impacts to a less--than--significant level because they would minimize impacts on western bumble bee by requiring preconstruction surveys to identify suitable habitat and determine occupancy of bumble bees at the project site; establishing buffers around occupied bumble bee nests identified during the surveys; minimizing the extent of ground disturbance to the minimum necessary to perform construction activities; restoring temporarily disturbed grassland habitat using a seed mix that includes flowering plants; restricting the use of herbicides around tower foundations; and ensuring proper implementation of all project protection measures by requiring an onsite biological monitor during ground-disturbing activities.

2020 Updated PEIR Mitigation Measure BIO-1b: Implement best management practices to avoid and minimize impacts on special-status species

PEIR Mitigation Measure BIO-1e: Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas

PEIR Mitigation Measure BIO-5c: Restore disturbed annual grasslands

2020 New Mitigation Measure BIO-22a: Conduct a preconstruction habitat assessment and focused surveys for western bumble bee

Prior to the start of construction, qualified biologist(s) will conduct botanical surveys in late spring/early summer to identify and map concentrations of flowering plants that provide food resources for western bumble bee. The areas containing higher densities and varieties of flowering plants will be evaluated by a qualified invertebrate biologist to determine if these areas provide suitable foraging habitat for western bumble bee. The habitat evaluation surveys would follow recommendations in the *Rusty Patched Bumble Bee Habitat Assessment Form and Guide* (Xerces Society for Invertebrate Conservation 2017).

If moderate to high quality foraging habitat for western bumble bee is identified in the project area based on the habitat assessment, these areas will be surveyed by qualified invertebrate biologist(s) (with experience conducting bumble bee surveys) within 1 year prior to the start of construction. Surveys would be conducted according to the methods in Thorp et al. (1983) or according to any future survey methodology specifically for western bumble bee proposed or approved by CDFW. The methods in Thorp et al. (1983) recommend surveys be conducted during four evenly spaced sampling periods during the flight season (March through September) (Thorp et al. 1983). For each sampling event, the biologist(s) would survey suitable habitat using nonlethal netting methods for 1 person-hour per 3 acres of the highest quality habitat or until 150 bumble bees are sighted, whichever comes first. If initial sampling of a given habitat area indicates that the habitat is of low quality or nonexistent, no further sampling of that area would be required. General guidelines and best practices for bumble bee surveys would follow USFWS' *Survey Protocols for the Rusty Patched Bumble Bee* (Bombus affinis) (U.S. Fish and Wildlife Service 2019b), which are consistent with other bumble bee survey protocols used by The Xerces Society (Hatfield et al. 2017; Washington Department of Fish and Wildlife et al. 2019).

If western bumble bee is determined not to be present at the project site or a qualified invertebrate biologist (experienced with bumble bees) concludes that there is a very low likelihood that the species is present, then no additional mitigation is required. If western bumble bees are determined to be present at the project site, then the project proponent will implement 2020 New Mitigation Measure BIO-22b.

2020 New Mitigation Measure BIO-22b: Implement protection measures to avoid and minimize effects on western bumble bee

If it is determined through preconstruction surveys conducted pursuant to 2020 New Mitigation Measure BIO-22a that western bumble bees are present at the project site, the following measures will be implemented to ensure that the proposed project does not have a significant impact on western bumble bee. *Implementation of some of these measures may require that the project proponent obtain incidental take permit from CDFW if western bumble bee remains a candidate or is formally listed under CESA before construction begins.* Additional conservation measures or conditions of approval may be required in applicable project permits (e.g., CESA incidental take permit).

- If bumble bee surveys identify occupied western bumble bee habitat within the project area, the project biologist would then conduct additional preconstruction surveys within the project disturbance footprint for active bee nest colonies and associated floral resources (i.e., flowering vegetation on which bees from the colony are observed foraging) no more than 30 days prior to any ground disturbance between March and September. The purpose of this preconstruction survey would be to identify active nest colonies and associated floral resources outside of permanent impact areas that could be avoided by construction personnel. The project biologist would establish, monitor, and maintain no-work buffers around nest colonies and floral resources identified during surveys. The size and configuration of the no-work buffer would be based on best professional judgment of the project biologist in coordination with the County. At a minimum, the buffer would provide at least 20 feet of clearance around nest entrances. Construction activities would not occur within the no-work buffers until the colony is no longer active (i.e., no bees are seen flying in or out of the nest for three consecutive days indicating the colony has completed its nesting season and the next season's queens have dispersed from the colony). Monitoring of an active nest could be conducted using a motion-detecting wildlife trail camera.

- To minimize temporary disturbance of suitable foraging and nesting habitat for western bumble bee, ground disturbance within suitable annual grassland habitat will be restricted to the minimum area necessary to perform construction activities.
- To encourage growth of additional nectar and pollen producing plants at the project site, disturbed grasslands that are revegetated in accordance with PEIR Mitigation Measure BIO-5c will use a seed mix combination that includes nectar and pollen producing plants commonly used as a food source by western bumble bee. Plants of the following genus are appropriate: *Cirsium* sp., *Erigonum* sp., *Solidago* sp., *Aster* sp., *Centaurea* sp., and *Penstemon* sp. These annual plants would be incorporated into the seed mix, as applicable for the existing habitat conditions.
- To minimize impacts on bees from herbicide drift, herbicide application around tower foundations will be performed using handheld equipment and will be restricted to a 20-foot radius buffer area around the tower foundations. The contractor will use an herbicide that has been shown to be less toxic to amphibians and invertebrates, such as 2, 4 D. Herbicides containing the surfactant POEA (polyoxyethylene tallow amine) will not be used at the project site. The most current information on herbicide toxicity on wildlife will be used to inform future decisions about herbicide use during operations.

Impact BIO-23: Potential disturbance or mortality of monarch butterfly (less than significant)

Potential effects on monarch butterfly were not addressed in the PEIR because the species was not a candidate for federal listing at the time that the PEIR was prepared. The project site supports approximately 4,371 acres of grassland and approximately 18 acres of vegetated aquatic (alkali wetland, freshwater marsh, and vernal pool) land cover types (Table 3.4-1) that represent potential foraging and breeding habitat for Monarch butterflies. Flowering plants within these habitats may provide nectar sources for foraging adult butterflies and where present, milkweed plants (*Asclepias* sp.) represent potential host plants for Monarch butterfly larvae and pupae. Monarch butterflies are not expected to winter at the project site because the only known wintering sites in California occur along the coast.

The extent of flowering plants within nonnative annual grassland at the project site has not been determined. It is expected that higher concentrations of flowering plants are present within low-lying portions of the project site, compared to the hilltops and ridgelines where new turbines are proposed. The higher elevation areas at the project site are exposed to high winds and tend to be drier, representing a harsher environment for the growth of annual flowering plants, as well as foraging butterflies. Narrow-leaved milkweed (*Asclepias fascicularis*), a known host plant for Monarch butterfly, was documented on the project site during 2020 botanical surveys conducted for the project. Individual populations of milkweed were not mapped but the species was reported to be sporadically scattered throughout the project site.

Overall, the project would permanently remove approximately 26 acres of annual grassland, which is less than 1% of the available grassland on the project site. The loss of less than 1% of available foraging habitat at the project site is not expected to substantially reduce the availability of foraging habitat in the project region for Monarch butterfly. Up to 264 acres of annual grassland would be temporarily disturbed during project construction (accounting for approximately 6% of the total available habitat); however, all lands temporarily disturbed by infrastructure installation would be returned to preproject conditions. At each reclamation site, the topography would be graded to match the contours of the natural surrounding landscape, stabilized, reseeded with an appropriate seed mixture, and allowed to become revegetated. Reclamation activities would be guided by a reclamation plan developed in coordination with the County and other applicable agencies.

Permanent and temporary disturbances within annual grassland could also result in the removal of milkweed plants (potential host plant for Monarch butterflies) if they are present within the construction footprint. Because the milkweed plant was only sporadically found throughout the project site, the removal of potential breeding habitat is expected to be negligible.

Overall, the small amount of permanent loss and temporary disturbances of potential foraging and breeding habitat for Monarch butterfly is not anticipated to result in substantial adverse effects on migrating and breeding Monarch butterflies. This impact would be less than significant. No mitigation is required.

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3.5 Cultural Resources

This section describes the regulatory and environmental setting for cultural resources. It also describes the impacts on cultural resources that would result from implementation of the project and mitigation for significant impacts where feasible and appropriate.

3.5.1 Existing Conditions

3.5.1.1 Regulatory Setting

Federal

National Historic Preservation Act (54 United States Code 300101 et seq.)

The National Historic Preservation Act (NHPA) establishes the federal government policy on historic preservation and the programs, including the National Register of Historic Places (NRHP), through which this policy is implemented. Under the NHPA, significant cultural resources, referred to as historic properties, include any prehistoric or historic district, site, building, structure, object, or landscape included in, or determined eligible for inclusion in, the NRHP. Historic properties also include resources determined to be a National Historic Landmark. National Historic Landmarks are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting United States heritage. A property is considered historically significant if it meets one or more of the NRHP criteria and retains sufficient historic integrity to convey its significance. This act also established the Advisory Council on Historic Preservation (ACHP), an independent agency that promotes the preservation, enhancement, and productive use of our nation's historic resources, and advises the President and Congress on national historic preservation policy. The ACHP also provides guidance on implementing Section 106 of the NHPA by developing procedures to protect cultural resources included in, or eligible for inclusion in, the NRHP. Regulations are published in 36 Code of Federal Regulations (CFR) Parts 60, 63, 800.

Section 106 of the NHPA (codified as 36 CFR Part 800) requires that effects on historic properties be taken into consideration in any federal undertaking. The process generally has five steps: (1) initiating Section 106 of the NHPA process, (2) identifying historic properties, (3) assessing adverse effects, (4) resolving adverse effects, and (5) implementing stipulations in an agreement document.

Section 106 of the NHPA affords the ACHP and the State Historic Preservation Officer, as well as other consulting parties, a reasonable opportunity to comment on any undertaking that would adversely affect historic properties. State Historic Preservation Officers administer the national historic preservation program at the state level, review NRHP nominations, maintain data on historic properties that have been identified but not yet nominated, and consult with federal agencies during Section 106 review.

The NRHP eligibility criteria (36 CFR Section 60.4) is used to evaluate significance of potential historic properties. Properties meeting any of the following criteria are considered eligible for listing in the NRHP if they retain integrity of the property's location, design, setting, materials, workmanship, feeling, or association:

a) Associated with events that have made a significant contribution to the broad patterns of our history.

b) Associated with the lives of persons significant to our past.

c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master; or that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction.

d) Have yielded, or may be likely to yield, information important in prehistory or history.

Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a Native American tribe to be determined eligible for NRHP inclusion. In addition, a broader range of Traditional Cultural Properties are also considered and may be determined eligible for or listed in the NRHP. Traditional Cultural Properties are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and that may be eligible because of their association with cultural practices or beliefs of living communities that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. In the NRHP programs, "culture" is understood to mean the traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community, be it an Indian tribe, a local ethnic group, or the nation as a whole.

State

California Environmental Quality Act (Public Resources Code Section 21000 et seq.)

State CEQA Guidelines Section 15064.5 provides specific guidance for determining the significance of impacts on historic resources (including architectural and archaeological resources) and unique archaeological resources. Under CEQA these resources are called *historical resources* whether they are of historic or prehistoric age. Public Resources Code (PRC) Section 21084.1 defines historical resources as those listed, or eligible for listing, in the California Register of Historical Resources (CRHR), or those listed in the historical register of a local jurisdiction (county or city). NRHP-listed *historic properties* located in California are considered historical resources for the purposes of CEQA and are also listed in the CRHR. The CRHR criteria for listing such resources are based on, and are very similar to, the NRHP criteria. PRC Section 21083.2 and State CEQA Guidelines Section 15064.5(c) provide further definitions and guidance for archaeological sites and their treatment.

State CEQA Guidelines Section 15064.5 also prescribes a process and procedures for addressing the existence of, or probable likelihood of, Native American human remains, as well as the unexpected discovery of any human remains within a project site. This includes consultations with appropriate Native American tribes.

The State CEQA Guidelines define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section 15064.5(b) prescribes that project effects that would "cause a substantial adverse change in the significance of an historical resource" are significant effects on the environment. Substantial adverse changes include physical changes to both the historical resource and its immediate surroundings.

Appendix G of the CEQA Guidelines provides an Environmental Checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts. Section 21083.2 defines *unique archaeological resources* as "any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria."

- Contains information needed to answer important scientific research questions and show that there is a demonstrable public interest in that information.
- Exhibits a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that resources are protected in compliance with CEQA and other applicable statutes. PRC Section 21081.6 requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process.

California Register of Historical Resources Sections 5024.1 and 14 California Code of Regulations Section 4850

PRC Section 5024.1 establishes the CRHR. The register lists all California properties considered to be significant historical resources. The CRHR also includes all properties listed or determined eligible for listing in the NRHP, including properties evaluated under Section 106. The criteria for listing are similar to those of the NRHP. The CRHR regulations govern the nomination of resources to the CRHR (14 California Code of Regulations Section 4850). The regulations set forth the criteria for eligibility as well as guidelines for assessing historical integrity and recognizing historical resources that merit special considerations.

Public Resources Code Sections 5097.98 and 5097.99

PRC Section 5097.98 discusses the procedures that need to be followed upon the discovery of Native American human remains. The Native American Heritage Commission (NAHC), upon notification of the discovery of human remains by the coroner, is required to notify those persons it believes to be most likely descended from the deceased Native American. It enables the descendant to inspect the site of the discovery of the Native American human remains and to recommend to the landowner (or person responsible for the excavation) means of treating, with dignity, the human remains and any associated grave goods. Furthermore, under Section 5097.99, it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn. Section 5097.99 sets penalties for these actions and also mandates that it is the policy of the State of California to repatriate Native American remains and associated grave goods.

California Health and Safety Code Section 7050.5(b)

This code established that any person who knowingly mutilates, disinters, wantonly disturbs, or willfully removes any human remains in or from any location without authority of the law is guilty of a misdemeanor. It further defines procedures for the discovery and treatment of Native American remains.

Assembly Bill 2641

Assembly Bill (AB) 2641 provides procedures for private landowners to follow up on discovering Native American human remains. Landowners are encouraged to consider culturally appropriate measures if they discover Native American human remains as set forth in PRC Section 5097.98. AB 2641 further clarifies how the landowner should protect the site both immediately after discovery and into the future.

Local

The *Alameda County General Plan* consists of several documents that discuss specific geographic areas in detail in the western part of the county, as well as general goals, policies, and actions for house, safety, conservation, open space, noise, and recreation. In 2012, the Alameda County Board of Supervisors adopted a historic preservation ordinance (Alameda County 2012) that codified the definition and maintenance of the Alameda County Register of Historic Resources, how properties can be added or removed from the county register, and what activities may be subject to review. The ordinance also provided incentives for the preservation of historic resources.

Alameda County planning staff utilize a technical report prepared in 1976 entitled *Archaeology in Alameda County: A Handbook for Planners* which assists in identifying the potential for archaeological resources throughout the County, using a four-step ranking of relative sensitivity. The *Handbook* includes a map that classifies areas of the County, from minimal to moderate to high to extreme archaeological sensitivity. The project site area includes some areas that are designated as having “high” sensitivity to the potential for encountering archaeological resources, and therefore careful investigation is necessary.

3.5.1.2 Environmental Setting

The project site is located along the eastern margin of the Diablo Range of the Coast Ranges geomorphic province (California Geological Survey 2002; U.S. Geological Survey 1977, 1986). The province is characterized by a northwest-trending series of mountain ranges and valleys, is bordered by the Great Valley to the east and the Pacific Ocean to the west, is composed of uplifted Mesozoic-aged (between 250 and 66 million years old) and Cenozoic-aged (less than 66 million years old) sedimentary rock, and runs subparallel to the San Andreas fault (California Geological Survey 2002). Much of the project site is situated on a range composed of uplifted and faulted upper Cretaceous-aged (between 100 and 66 million years old) to Pliocene-aged (between 5 and 2.5 million years old) silt and sandstone. In a few areas, this range has been dissected by streams, and the resulting valleys have infilled with Holocene-aged (less than 12,000 years old) alluvium (Dibblee and Minch 2006a, 2006b). With the exception of a small number of locations within the project site that contain Holocene-aged alluvium, nearly all of the soils within the project site are composed of residuum, which are soils formed as a result of in-situ decomposition (Welch et al. 1966).

Cultural Setting

Prehistoric Period

The project site is located along the western margin of the Central Valley cultural region of California. Early inhabitants of the Central Valley used the various habitats found throughout the valley, including riparian forest, marsh, alkali basins, oak savanna, and foothill woodland communities. They created a sophisticated material culture and established a trade system involving a wide range of manufactured goods from distant and neighboring regions, and their population and villages prospered in the centuries prior to historic contact (Rosenthal et al. 2007:147, 149). At the time of initial contact with European settlers (between 1773 and 1821), approximately 100,000 people were living in the Central Valley. This represented about one third of the state's native population (Cook 1955, 1976, 1978; Moratto 1984:171). The setting provided below is based on Fredrickson's (1973, 1974) California adaptation of the Willey and Phillips (1958) prehistoric cultural chronology, and divides this chronology into five periods. These periods are analytical constructs and do not necessarily reflect Native American views.

Paleo-Indian (cal 11,550–8500 B.C.)

Because periodic episodes of erosion and deposition during the Holocene have removed or buried large segments of the Late Pleistocene landscape (Rosenthal and Meyer 2004, White 2003), archaeological deposits that would be associated with these landforms have been either destroyed or buried beneath more recent alluvial deposits (Rosenthal and Meyer 2004, Rosenthal et al. 2007:151, White 2003). Basally thinned and fluted projectile points, found at scattered surface locations primarily in the southern portion of the basin, provide the earliest accepted evidence of human occupation in the Central Valley (Rosenthal et al. 2007:151). No such finds have been reported in the project vicinity.

Lower Archaic (cal 8500–5550 B.C.)

As with the Paleo-Indian period, the Lower Archaic is not well represented in the project site. Those Lower Archaic sites that have been identified in the Central Valley are characterized by mostly isolated finds, including stemmed points, chipped stone crescents, and early concave base points, primarily on the ancient shore of Tulare Lake (Fenenga 1992, Wallace and Riddell 1991). No Lower Archaic sites are recorded within the project site or its vicinity.

Middle Archaic (cal 5550–550 B.C.)

During the Middle Archaic period, significant climate changes spurred two distinct settlement-subsistence adaptations in central California. One was centered on the foothills, and the other was on the valley floor (Fredrickson 1984:102–103). Middle Archaic sites appear to have been increasingly sedentary, as indicated by refined and specialized tool assemblages and features, a wide range of non-utilitarian artifacts, abundant trade objects, and plant and animal remains indicative of year-round occupation (Moratto 1984; Ragir 1972, White 2003).

Upper Archaic (cal 550 B.C.–A.D. 1100)

The Upper Archaic period is characterized by another change in climate conditions, but, during this period, to a cooler, wetter, and more stable climate. New technologies were developed during this period, which included new types of bone tools and bone implements, and widespread manufactured goods such as Haliotis ornaments and ceremonial blades (Bennyhoff and Fredrickson 1994, Fredrickson 1974, Moratto 1984). Sites including human remains displaying extended burial postures have been identified along the side streams and axial marshes of San Joaquin and Merced Counties (Rosenthal et al. 2007:156).

Emergent Occupation (cal A.D. 1000 to Historic Period)

The archaeological record for the Emergent/Historic period is more substantial and comprehensive than those of earlier periods in the Central Valley, and the artifact assemblages are the most diverse (Bennyhoff 1977; Fredrickson 1974; Kowta 1988). The Emergent period is associated with the use of the bow and arrow over the dart and atlatl (Bennyhoff 1994), and increased variation in burial types and furnishings suggests more complex social developments (Atchley 1994, Bennyhoff and Fredrickson 1994).

Ethnographic Period

The project site is located on the eastern boundary of the Ohlone traditional land and the western edge of the Northern Valley Yokuts traditional area. Both are briefly described below.

Ohlone (Costanoan)

The territory of the Ohlone people extended along the coast from the Golden Gate in the north to just below Carmel to the south, and as far as 60 miles inland. The territory encompassed a lengthy coastline, as well as several inland valleys (Levy 1978:485–486). The Ohlone were hunter-gatherers and relied heavily on acorns, supplementing their diet with a range of other foodstuffs, such as various seeds (the growth of which was promoted by controlled burning), buckeye, berries, roots, mammals, waterfowl, reptiles, and insects (Levy 1978:491–493). Prior to contact, the Ohlone were politically organized by tribelet, with each having a designated territory. A tribelet was an organizational unit consisting of one or more villages with individuals generally numbering 100 to 250 members (Kroeber 1962). Ohlone villages typically had four types of structures: domed dwellings, sweathouses, oval or round dance structures, and a domed assembly house (Crespi 1927:219; Levy 1978:492).

Northern Valley Yokuts

Yokuts is a term applied to a large and diverse number of people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts are the historical occupants of the central and northern San Joaquin Valley (Wallace 1978:462). Northern Valley Yokut villages tended to congregate around water sources, and relied heavily on fishing (in particular, salmon fishing). They varied their diet with waterfowl and the harvesting of wild plant food, such as acorns, seeds, and tule root (Wallace 1978:464). Most settlements, or at least the principal ones, were built atop low mounds on or near the banks of large watercourses for protection against spring flooding (Schenck 1926:132; Schenck and Dawson 1929:308; Cook 1960:242, 259, 285). Village populations averaged around 300 people, and villages contained oval or round family houses, a community lodge for dances, and a sweathouse (Wallace 1978:465).

Historic Period

The project site is located in the hills adjacent to the Altamont Pass, between the cities of Livermore (to the west, in Alameda County) and Tracy (to the east, in San Joaquin County). Accordingly, the historic cultural setting of the project is associated with the development of those two areas. Throughout the Historic period, the development of infrastructure and evolution of the agrarian economy have been most influential in guiding settlement and land use in this area.

Early Settlement of Livermore Valley and San Joaquin Valley (1769–1850s)

As early as 1769, the Spanish explorer José Francisco Ortega led an expedition through present-day Alameda County. Seven years later, Juan Bautista de Anza and Pedro Font traveled through the region. The National Parks Service established the Juan Batista de Anza National Historic Trail in 1990 to commemorate the expedition by designating a network of highways in California and

Arizona (including the Patterson Pass Road) as a scenic route for public appreciation. The Trail is thematic and interpretive, and is not a historical resource.

In 1797, Spain established the Misión del Gloriosísimo Patriarca Señor San José, currently referred to as Mission San Jose, 15 miles northeast of the present-day City of San Jose and approximately 20 miles southwest of the project location. Under the direction of Father Fermín Lasuen, Mission San Jose prospered as an agricultural center, grazing sheep and cattle on the land now known as Livermore Valley (Kyle et. al. 2002). However, the mission's success came with a heavy cost to the Ohlone population who inhabited the territory. Many Ohlone were forced to live and work at the mission. Introduced disease, harsh living conditions, and reduced birth rates during this period resulted in a population decline. While the Ohlone numbered around 10,000 when the mission was established, their population diminished to less than 2,000 by 1832 (Cook 1943a, 1943b).

After the missions were secularized by the Mexican government (around 1830), many Native Americans, including Ohlones, left the missions in an attempt to reestablish their previous lives. Many Ohlone found work as wage laborers on the ranchos and mines or in domestic positions. There was a partial return to aboriginal religious practices and subsistence strategies, but for the most part, the Ohlone culture was greatly diminished (Levy 1978:486–487). Today, descendants of the Ohlone still live in the area, and many are active in maintaining their traditions and advocating for Native American issues.

With Mexico's independence from Spain in 1822, missions in California were secularized and settlement in Alta California was facilitated through land grants. Rancho land grants were granted in order to encourage agriculture and ranching, reward soldiers, and to provide for settlers who did not own property. Of the more than 800 rancho grants made, the majority were granted by the Mexican government. Between 1841 and 1846, ranchos were established in what would become San Joaquin Valley, including Rancho Pescadero, located in San Joaquin County near present-day Tracy, and Rancho Las Positas, located in the eastern portion of what would become Livermore Valley (Kyle et.al. 2002).

In 1848, the United States defeated Mexico in the Mexican-American War, and Mexico surrendered its Alta California land through the Treaty of Guadalupe Hidalgo. That same year, the Gold Rush brought hundreds of immigrants to Alameda County on their way to the gold fields in California. Attracted by the fertile land and mild climate of the East Bay, many chose to stay and start a new life. The area quickly became one of the leading agricultural hubs of California, with crop farming, dairy farming, and livestock grazing serving as the principal industries of the period (Livermore Heritage Guild 2019a).

Township Development (1860s–1910s)

Tracy

Tracy owes its early development to the introduction of the Central Pacific Railroad. The Altamont line, which extended south from Sacramento, first traversed Altamont Pass in 1869. While development began in the vicinity with the towns of Lathrop and Ellis, Tracy was founded in 1878 at the junction of the Altamont line and the Central Pacific's San Pablo and Tulare line. By the 1880s, Tracy also served as the hub for the Southern Pacific line from Oakland to Martinez and the Southern Pacific line through Los Banos to Los Angeles (Tracy Historical Society 2004:7).

The first buildings in Tracy were moved 3 miles from Ellis. By 1910, a merger of the Central Pacific and Southern Pacific Railroads resulted in relocation of the Southern Pacific headquarters from Lathrop to Tracy. Although this change did not result in the physical relocation of buildings, it did spur introduction of new railroad facilities, such as repair shops and switching yards, as well as residential development, and addition of churches, hotels, saloons, stores, and other community amenities. When the town incorporated as a city in 1910, the population had grown to about 2,000 people (Tracy Historical Society 2004:7–9).

Livermore

Although the town of Livermore was named for Robert Livermore, one of the early settlers in the region who received the Rancho Las Positas land grant in 1839, it was founded in 1869 by William Mendenhall. The town site was established on a 100-acre portion of Mendenhall's property, and 20 acres was provided to Central Pacific Railroad to support routing the transcontinental railroad through Livermore. The establishment of a Western Pacific Railroad line (an independent branch of the Central Pacific Railroad) caused Livermore to quickly become the economic center of the region (Kyle et al. 2002; Nale 2003). In the Livermore Valley, the economy began to shift from livestock to agriculture during the 1850s. Introduction of railroad transportation spurred this trend by providing farmers a means of conveying their harvested crops to markets in the region (Livermore Heritage Guild 2019b).

Late-Nineteenth and Twentieth-Century Growth (1910s–1980s)

The region continued to grow slowly during the late nineteenth and early twentieth century. The surrounding area remained primarily an agricultural community populated with ranches and farms. While early settlers had grazed sheep on the unfenced hills and valleys. As livestock became more varied with introduction of cattle, horses, and mules, fencing enclosures became a common feature on the landscape. Cattle ranches began to dominate around World War I, and between 1910 and 1920 Portuguese immigrants settled in the area, launching what would become a robust dairy industry (Tracy Historical Museum 2017; Tracy Historical Society 2004:19, 32).

Without the benefits of irrigation, early settlers in the region first engaged in dry land farming. Although experimentation with plowing depths varying from 2 to 6 inches and use of summer fallowing practices were implemented with some success during this early period, farming flourished when Delta levees and irrigation infrastructure was built. Irrigation in the Tracy area began with the Naglee-Burk Track in 1912, West Side Irrigation District in 1918, and Banta-Carona Irrigation District in 1926. Row crops and orchards, barley, tomatoes, asparagus, nuts, and fruit were cultivated, and associated processing plants were developed (Tracy Historical Society 2004:7–8, 19, 35).

In 1913, transportation was improved with the construction of the Lincoln Highway, which later became known as Highway 50/Altamont Pass Road (William Self Associates 2002:4). The route, located north of the project site, spurred a small degree of development in the immediate vicinity of the project site.

While Tracy's importance as a railroad center declined with the end of the steam era in the 1950s and expanded highway infrastructure, agriculture continued to be an essential industry through the 1950s and the post-World War II era was a period of growth in Livermore Valley. Increased water demands throughout the state spurred planning and development of the California Aqueduct beginning in the 1950s. The structure, designed to redistribute water from the Sacramento-San

Joaquin Delta to the southern end of the state at Lake Perris in Riverside County, was 444 miles long, with mainline segments located in Alameda and San Joaquin Counties. A portion of the California Aqueduct south of Bethany Reservoir is located in the project site. Constructed from 1960 to 1974, the California Aqueduct is the primary delivery system of the State Water Project (Ambacher 2011). As the California Aqueduct was completed, development from the San Francisco Bay sprawled east, and cities such as Livermore and Tracy began to see another pulse of development (Tracy Historical Society 2004:8–9).

Wooden windmills, used to provide reliable water supply for individual farms, were common features in the rural historic landscape throughout the late-nineteenth and early-twentieth centuries. It wasn't until the 1980s that wind began to serve power needs at a regional scale. With winds through the Altamont Pass reaching more than 80 miles per hour, the first modern wind turbine was erected in 1982 (Kyle et al. 2002:24). Although historic aerial photographs and topographic maps confirm the still largely undeveloped setting of the project site and its immediate vicinity, increased presence of wind turbines and associated infrastructure does accompany cattle ranching uses and increasing suburban development along the Interstate 580 corridor.

3.5.2 Environmental Impacts

This section describes the potential impacts of the proposed project on cultural resources and describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided, where feasible and appropriate.

3.5.2.1 Methods for Analysis

Cultural resources studies for the project were carried out exclusively by ICF cultural resources staff in 2020. The studies were presented in the cultural resources technical report for the project (ICF 2020).

Records Search

On January 15, 2020, ICF staff conducted a cultural resources records search at the Northwest Information Center (NWIC) at Sonoma State University in Rohnert Park. The records search covered the project site and 0.25-mile buffer around the project site. The purpose was to identify any previously recorded cultural resources in the project vicinity. Also included in the search were previous cultural resources studies that have included portions of the Project site or areas within the 0.25-mile buffer.

The records search was performed using data from the following sources.

- NRHP.
- CRHR.
- Office of Historic Preservation's Directory of Properties in the Historic Property Data File.
- Office of Historic Preservation's Archeological Determinations of Eligibility (April 5, 2012).

The record search results indicated that four cultural resources studies had previously intersected the project site and eight studies were conducted within the 0.25-mile buffer. The records search also indicated that no previously recorded cultural resources were identified in the project site and 19 historic-era resources were identified within the 0.25-mile buffer.

3.5.2.2 Additional Literature Search

Additionally, cultural resources staff consulted 7.5-minute series topographic maps (1907, 1914, 1916, 1921, 1929, 1941 1948, 1955, 1969, 1975 and 1981) and historic aerial photographs (1949, 1958, 1959, 1966, 1968, 1971, 1979, 1982, and 1987). These topographic maps and aerial photographs indicate the presence of historic ranching activities throughout the larger project site.

3.5.2.3 Sacred Lands File Search

ICF contacted the NAHC on March 11, 2020, to identify any areas of concern within the project site that may be listed in the NAHC's Sacred Land File. The NAHC responded on March 13, 2020 stating that no Sacred Lands were identified within the project site.

3.5.2.4 Archaeological Sensitivity

As noted in Section 3.5.1.1, the County of Alameda Planning Department uses a planning map to assess archaeological sensitivity. That map indicates that in 1976 approximately 1 square mile in the southwest portion of the project site had high archaeological sensitivity (Alameda County 1976).

The project site has been extensively studied through a variety of reports, including studies for transmission lines and wind resources; cellular tower studies; area-wide inventory reports; and studies for commercial and residential development. No resources have been previously recorded in the Patterson Pass project site, and the area is not considered sensitive for archaeological resources.

Previous studies throughout eastern Alameda County have documented that prehistoric resources in this area are buried and may have little or no visible surface evidence. Review of the geology of the project site revealed that it is primarily located on upper Cretaceous- to Pliocene-aged landforms, with small and spatially limited portions of the project site located on Holocene-aged landforms. Since landforms that predate the Holocene epoch have limited potential to contain buried archaeological resources, the project site is similarly expected to have limited potential to contain buried archaeological resources (ICF 2020).

3.5.2.5 Field Survey

From February 17-18 and February 23-27, 2020, ICF cultural resources staff—J. Tait Elder, January Tavel, Lily Arias, Yuka Oiwa, Alex Ryder, and Christian Solfisburg conducted pedestrian surveys of the project site. When possible, transect spacing of no more than approximately 20 meters was used to provide a high degree of ground coverage. The locations of subsurface exposures caused by such factors as rodent activity, off-road vehicle ruts, road cuts, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collection occurred during the pedestrian survey.

As a result of the survey, no undocumented precontact period archaeological resources were identified within the APE during the pedestrian survey. Therefore, no precontact period cultural resources were evaluated for NRHP/CRHR eligibility under Criteria A/1, B/2, C/3, or D/4 as a result of this survey. The survey identified a single-story residential building on Patterson Road in the southwestern portion of the APE. The building was recorded on DPR 523-series forms, and the subject property was evaluated and found ineligible for listing in the NRHP/CRHR under Criteria A/1, B/2, C/3, or D/4.

3.5.2.6 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- A substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
- A substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Disturbance of any human remains, including those interred outside of formal cemeteries.

3.5.2.7 Impacts and Mitigation Measures

Project Impacts

Impact CUL-1: Potential to cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 (no impact)

The PEIR identified nineteen historic architectural resources within the program area. One of the architectural resources , a single-story residential building on Patterson Road with no street address, was identified within the current project site, and was determined ineligible for inclusion in the National Register and California Register. As such the building is not a historical resource for the purposes of CEQA. No other historical resources were identified during the field survey and records searches conducted for this SEIR. Thus, there would be no impact to historical resources.

Impact CUL-2: Potential to cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 (less than significant with mitigation)

The PEIR identified a variety of prehistoric and historic-era archaeological resources in the program area and determined that there is a possibility of encountering and damaging previously unrecorded archaeological resources during ground-disturbing activities. Mitigation measures were included to reduce the impact to a less-than-significant level.

No previously undocumented archaeological resources were identified within the project site during the pedestrian survey.

Although the project site and vicinity may have been used by prehistoric peoples, the nature of this land use would primarily have been resource collection. Consequently, the expected range of prehistoric artifact and feature types in the project site includes projectile points and lithic tools, lithic debitage, bedrock mortars, and grinding stones. Although the area could have been used for upland resource collection activities, the project site is located far from permanent water sources and is, therefore, expected to have moderate to low potential to contain prehistoric archaeological resources.

In the event that archaeological resources are inadvertently uncovered during ground disturbing activities (construction of new access roads, turbine foundations, tower replacement, substation construction, and utility trenching), implementation of PEIR Mitigation Measures CUL-2c, *Conduct* *worker awareness training for archaeological resources prior to construction;* and CUL-2d, *Stop work if cultural resources are encountered during ground-disturbing activities*, would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure CUL-2c: Conduct worker awareness training for archaeological resources prior to construction

Prior to the initiation of any site preparation and/or the start of construction, the project applicant will ensure that all construction workers receive training overseen by a qualified professional archaeologist who is experienced in teaching nonspecialists, to ensure that forepersons and field supervisors can recognize archaeological resources (e.g., areas of shellfish remains, chipped stone or groundstone, historic debris, building foundations, human bone) in the event that any are discovered during construction.

PEIR Mitigation Measure CUL-2d: Stop work if cultural resources are encountered during ground-disturbing activities

The project applicant will ensure that construction specifications include a stop-work order if prehistoric or historic-era cultural resources are unearthed during ground-disturbing activities. If such resources are encountered, the project applicant will immediately halt all activity within 100 feet of the find until a qualified archaeologist can assess the significance of the find. Prehistoric materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or tool-making debris; culturally darkened soil ("midden") containing heat-affected rocks and artifacts; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered-stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. If the find is determined to be potentially significant, the archaeologist, in consultation with the Native American representative (if appropriate), will develop a treatment plan that could include site avoidance, capping, or data recovery.

Impact CUL-3: Disturbance of any human remains, including those interred outside of dedicated cemeteries (less than significant with mitigation)

The PEIR did not identify any known formal cemeteries or burials in the program area; however, the PEIR noted the possibility that ground-disturbing activities could uncover previously unknown buried human remains, which could cause a potentially significant impact. Mitigation measures to reduce the impact to a less-than-significant level consisted of stop-work orders.

There are no known formal cemeteries within the project site, and neither the results of the records search nor the pedestrian surveys indicated that human remains are present in the project site. However, there is always the possibility that ground-disturbing activities (construction of new access roads, turbine foundations, tower replacement, substation construction, and utility trenching), during construction may uncover previously unknown buried human remains. This impact would be potentially significant. However, implementation of PEIR Mitigation Measure CUL-3, *Stop work if human remains are encountered during ground-disturbing activities*, would reduce the impact to a less-than-significant level.

PEIR Mitigation Measure CUL-3: Stop work if human remains are encountered during ground-disturbing activities

The project applicant will ensure the construction specifications include a stop-work order if human remains are discovered during construction or demolition. There will be no further excavation or disturbance of the site within a 100-foot radius of the location of such discovery, or any nearby area reasonably suspected to overlie adjacent remains. The Alameda County Coroner will be notified and will make a determination as to whether the remains are Native American. If the Coroner determines that the remains are not subject to the coroner's authority, the coroner will notify the Native American Heritage Commission, who will attempt to identify descendants of the deceased Native American. If no satisfactory agreement can be reached as to the disposition of the remains pursuant to this state law, then the landowner will re-inter the human remains and items associated with Native American burials on the property in a location not subject to further subsurface disturbance. A final report will be submitted to Alameda County. This report will contain a description of the mitigation program and its results, including a description of the monitoring and testing resources analysis methodology and conclusions and a description of the disposition/curation of the resources.

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3.6 Energy

This section describes the regulatory and environmental setting for energy related to the project, describes project impacts on use of energy, and identifies mitigation measures that would avoid or reduce potential impacts to a level that is less than significant.

3.6.1 Existing Conditions

3.6.1.1 Regulatory Setting

State Regulations

The following California State Senate bills apply to energy in the inventory area.

Senate Bills 1078, 107, and 2—Renewables Portfolio Standard (2011)

Senate Bills (SBs) 1078 (2002), 107 (2006), and 2 (2011), California's Renewables Portfolio Standard (RPS), obligate investor-owned utilities, energy service providers, and Community Choice Aggregators to procure additional retail sales per year from eligible renewable sources with the target of procuring 33% of retail sales from renewable resources by 2020. California Public Utilities Commission and California Energy Commission are jointly responsible for implementing the program.

Senate Bill 350, Chapter 547, Clean Energy and Pollution Reduction Act of 2015

SB 350 (DeLeon), also known as the Clean Energy and Pollution Reduction Act of 2015, was approved California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions require the following by 2030: (1) a Renewable Portfolio Standards (RPS)[1] of 50 percent and (2) doubling of the statewide energy efficiency savings related to natural gas and electricity end uses. In order to meet these provisions, the bill requires large utilities to develop and submit integrated resource plans that detail how the utilities will reduce GHG emissions and increase the use of clean energy resources while meeting customers' needs.

Senate Bill 100—The 100 Percent Clean Energy Act of 2018 (2018)

SB 100 builds on SB 350, the Clean Energy and Pollution Reduction Act of 2015, which required the following by 2030: (1) an RPS of 50% and (2) a doubling of energy efficiency (electrical and natural gas) by 2030, including improvements to the efficiency of existing buildings. SB 100 increases the 2030 RPS target set in SB 350 to 60% and requires an RPS of 100% by 2045.

[1] The RPS is one of California's key programs for promoting renewable energy use within the state. The program sets forth continuous procurement of renewable energy for load-serving entities within California (California Energy Commission 2020a).

Regional and Local Regulations

Alameda County Community Climate Action Plan

In June 2011, the Alameda County Board of Supervisors approved a *Community Climate Action Plan* (CCAP) for the unincorporated areas of Alameda County. The goal of the CCAP is to reduce Countywide GHG emissions by 15% by 2020. The CCAP includes measures to reduce GHG emissions from the following activities.

- Transportation (e.g., bicycle infrastructure and transit service).
- Planning (e.g., encouraging high-density development and mixed-use development).
- Water conservation (e.g., water-efficient appliances and rainwater use).
- Waste diversion (e.g., improve services for recycling and composting)
- Building energy use (e.g., energy retrofits).
- Green infrastructure (e.g., urban forest expansion).

An environmental review was completed under CEQA for the CCAP to identify any significant impacts on the environment, and, how those impacts may be mitigated. The Negative Declaration and Initial Study prepared by County planning staff indicates that the General Plan Amendment and adoption of the CCAP would have no significant environmental impacts in any category of environmental issue reviewed. The CCAP, General Plan Amendment, and Negative Declaration were adopted by the Board of Supervisors on February 4, 2014, and the CCAP is now in effect and part of the *Alameda County General Plan* (Alameda County 2014).

Alameda County East County Area Plan

The East County Area Plan sets forth the following goal, and policies related to energy resources and use that are applicable to this project (Alameda County 2000).

Windfarms

Goal: To maximize the production of wind generated energy.

Policy 168: The County shall recognize the importance of windpower as a clean, renewable source of energy.

Policy 169: The County shall allow for continued operation, new development, redevelopment, and expansion of existing and planned windfarm facilities within the limits of environmental constraints.

3.6.1.2 Environmental Setting

Land use on the project site and the surrounding APWRA consists largely of cattle-grazed land supporting operating wind turbines and ancillary facilities. Many of the parcels on the project site were previously used for wind production. No substantial energy demands are generated by existing uses on the project site.

3.6.2 Environmental Impacts

PG&E maintains transmission and distribution lines throughout Alameda County. The proposed facility would generate electricity to be transmitted from the project site to the regional power grid through a power purchase agreement with a local community choice aggregator.

3.6.2.1 Methods for Analysis

- The assessment of energy impacts was done based on Appendix F and Appendix G of the State CEQA Guidelines.

3.6.2.2 Thresholds of Significance

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant energy impact if it would:

- Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The analysis of energy consumption in this SEIR does not have a corollary in the PEIR, because the state CEQA Guidelines at the time that the PEIR was being prepared in 2014 did not require the energy impacts of a project to be identified.

3.6.2.3 Impacts and Mitigation Measures

Impact EN-1: Wasteful, inefficient, or unnecessary consumption of energy resources during Project construction or operation (less than significant~~ with mitigation~~)

Construction

Project construction would require use of a variety of construction equipment, including heavy equipment, excavator, trucks, graders, and a crane. Project construction encompasses up to six phases. Most of the energy would be consumed during road construction, foundation and electrical work, turbine delivery and installation, and electrical trenching and substation construction.

Although substantial amounts of energy would be used in construction of the project, the expenditure of this energy would be temporary in duration and would be outweighed by the energy produced by operation of the proposed wind energy facility. Energy impacts would be less than significant.

Operation

In 2025, California is expected to generate approximately 71,000 gigawatt hours (GWh), while peak demand is expected to range from nearly 67 to 70 gigawatts (GW) (California Energy Commission 2020b and 2020c). During operations, the project would produce electricity via wind power which would help to meet California's energy demands with renewable sources of energy, and ultimately, would help to decrease the State's reliance on carbon-based, or nonrenewable, energy resources. Therefore, potential energy impacts of project operation would be less than significant and no mitigation is necessary.

Impact EN-2: Conflict with or obstruction of a state or local plan for renewable energy or energy efficiency (No impact)

The project would not obstruct state or local plans for renewable energy or energy efficiency. Rather, the project entails installation of wind turbines that would increase available renewable energy and assist California in meeting its RPS, GHG reduction, and carbon neutrality goals. There would be no impact. No mitigation is required.

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3.7 Geology, Soils, Mineral Resources, and Paleontological Resources

This section describes the regulatory and environmental setting for geology, soils, mineral resources, and paleontological resources in the project site. It also describes impacts on geology, soils, mineral resources, and paleontological resources that would result from implementation of the project. Mitigation measures are prescribed where feasible and appropriate.

3.7.1 Existing Conditions

3.7.1.1 Regulatory Setting

No federal regulations apply to mineral resources or paleontological resources in the project site. The following federal regulations are related to geologic hazards or soils.

International Building Code

The design and construction of engineered facilities in California must comply with the requirements of the International Building Code (IBC) and the adoptions of that code by the State of California (see *California Building Standards Code* in the *State* subsection).

U.S. Geological Survey Landslide Hazard Program

To fulfill the requirements of Public Law 106-113, the U.S. Geological Survey (USGS) created the National Landslide Hazards Program to reduce long-term losses from landslide hazards by improving understanding of the causes of ground failure and suggesting mitigation strategies. The Federal Emergency Management Agency is the responsible agency for the long-term management of natural hazards.

Clean Water Act Section 402 (National Pollutant Discharge Elimination System Program)

Section 402 of the Clean Water Act (CWA) mandates that certain types of construction activity comply with the requirements of the U.S. Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) program. EPA has delegated to the State Water Resources Control Board the authority for the NPDES program in California, where it is implemented by the state's nine Regional Water Quality Control Boards. Construction activity disturbing at least 1 acre must obtain coverage under the state's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2010-0014-DWQ). (See *Construction Activities Storm Water Construction General Permit [2010-0014-DWQ Permit]*).

Additional details of the CWA are described in Section 3.10, *Hydrology and Water Quality*.

State

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (Public Resources Code [PRC] Section 2621 et seq.) is intended to reduce risks to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy[1] across the traces of active faults and strictly regulates construction in the corridors along active faults capable of surface rupture or fault creep (earthquake fault zones). Generally the required setback is 50 feet from an active fault trace. The act also defines criteria for identifying active faults, giving legal weight to terms such as *active*, and establishes a process for reviewing building proposals in and adjacent to earthquake fault zones.

Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are *sufficiently active* and *well defined*. A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the act as referring to approximately the last 11,700 years). A fault is considered well-defined if its trace can be identified clearly by a trained geologist at the ground surface, or in the shallow subsurface using standard professional techniques, criteria, and judgment (Bryant and Hart 2018).

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act—the state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards; and cities and counties are required to regulate development within mapped seismic hazard zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within seismic hazard zones until appropriate site-specific geologic and/or geotechnical investigations have been carried out and measures to reduce potential damage have been incorporated into the development plans. Geotechnical investigations conducted within seismic hazard zones must incorporate standards specified by California Geological Survey Special Publication 117a, *Guidelines for Evaluating and Mitigating Seismic Hazards in California* (California Geological Survey 2008a).

Construction Activities Storm Water Construction General Permit (2010-0014-DWQ Permit)

Stormwater dischargers whose projects disturb at least 1 of acre of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs at least 1 acre, are required to obtain coverage under the General Permit Order 2010-0014-DWQ.

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[1] With reference to the Alquist-Priolo Act, a *structure for human occupancy* is defined as one "used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year" (California Code of Regulations, Title 14, Div. 2, Section 3601[e]).

Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

Coverage under the General Permit is obtained by submitting permit registration documents to the State Water Resources Control Board that include a risk level assessment and a site-specific stormwater pollution prevention plan (SWPPP) identifying an effective combination of erosion control, sediment control, and non-stormwater best management practices (BMPs). The General Permit requires that the SWPPP define a program of regular inspections of the BMPs and, in some cases, sampling of water quality parameters. The San Francisco Bay Regional Water Quality Control Board administers the NPDES stormwater permit program in Alameda County. The 14 cities, the county, and the two flood control districts of Alameda County share one NPDES permit that is managed through a consortium of agencies called the Alameda Countywide Clean Water Program.

California Building Standards Code

The California Building Standards Code (CBSC) (24 California Code of Regulations) provides the minimum standards for structural design and construction. The CBSC is based on the IBC, which is used widely throughout United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The CBSC requires that "classification of the soil at each building site will be determined when required by the building official" and that "the classification will be based on observation and any necessary test of the materials disclosed by borings or excavations." In addition, the CBSC states that "the soil classification and design-bearing capacity will be shown on the (building) plans, unless the foundation conforms to specified requirements." The CBSC provides standards for various aspects of construction, including (i.e., not limited to) excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, certain aspects of the project would be required to comply with all provisions of the CBSC.

The CBSC requires extensive geotechnical analysis and engineering for grading, foundations, retaining walls, and other structures, including criteria for seismic design.

California Surface Mining and Reclamation Act of 1975

The principal legislation addressing mineral resources in California is the Surface Mining and Reclamation Act of 1975 (SMARA) (PRC Sections 2710–2719), which was enacted in response to land use conflicts between urban growth and essential mineral production. The stated purpose of SMARA is to provide a comprehensive surface mining and reclamation policy that will encourage the production and conservation of mineral resources while ensuring that adverse environmental effects of mining are prevented or minimized; to ensure that mined lands are reclaimed and residual hazards to public health and safety are eliminated; and to give consideration to recreation, watershed, wildlife, aesthetic, and other related values. SMARA governs the use and conservation of a wide variety of mineral resources, although some resources and activities are exempt from its provisions, including excavation and grading conducted for farming, construction, or recovery from flooding or other natural disaster.

SMARA provides for the evaluation of an area's mineral resources using a system of Mineral Resource Zone (MRZ) classifications that reflect the known or inferred presence and significance of a given mineral resource. The MRZ classifications are based on available geologic information, including geologic mapping and other information on surface exposures, drilling records, and mine data, and on socioeconomic factors such as market conditions and urban development patterns. The MRZ classifications are defined as follows.

- **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 for their presence exists.
- **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 into any other MRZ.

Although the State of California is responsible for identifying areas containing mineral resources, the county or city is responsible for SMARA implementation and enforcement by providing annual mining inspection reports and coordinating with the California Geological Survey (CGS).

Mining activities that disturb more than 1 acre or involve excavation of at least 1,000 cubic yards of material require a SMARA permit from the lead agency, which is the county, city, or board that is responsible for ensuring that adverse environmental effects of mining are prevented or minimized. The lead agency establishes its own local regulations and requires a mining applicant to obtain a surface mining permit, submit a reclamation plan, and provide financial assurances pursuant to SMARA.

Certain land-disturbing activities do not require a permit, such as excavation related to farming, grading related to restoring the site of a natural disaster, and grading related to construction.

California Public Resources Code

Several PRC sections protect paleontological resources. Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that result from development on public lands.

Local

The policies and regulations of the county government that address issues related to geology, such as seismic hazards, slope stability, and erosion, and mineral resources are found in the Alameda General Plan, the *East County Area Plan* (ECAP), the Alameda County Code of Ordinances, and the Alameda County Stormwater Management Plan and are described below. There are no general plan policies related to paleontological resources.

Alameda County General Plan

The Safety Element of the *Alameda County General Plan* specifies numerous policies and action to meet its relevant goal, which is, "To minimize risks to lives and property due to seismic and geologic hazards." These policies and actions are listed below (Alameda County Community Development Agency 2014).

Policies

P1. To the extent possible, projects should be designed to accommodate seismic shaking and should be sited away from areas subject to hazards induced by seismic shaking (landsliding, liquefaction, lurking, etc.) where design measures to mitigate the hazards will be uneconomic or will not achieve a satisfactory degree of risk reduction. (Source: Seismic Safety and Safety Element, pg. 6)

P2. Structures should be located at an adequate distance away from active fault traces, such that surface faulting is not an unreasonable hazard. (Source: Seismic Safety and Safety Element, pg. 6)

P3. Aspects of all development in hillside areas, including grading, vegetation removal and drainage, should be carefully controlled in order to minimize erosion, disruption to natural slope stability, and landslide hazards. (Source: Seismic Safety and Safety Element, pg. 6)

P4. Within areas of demonstrated or potential slope instability, development should be undertaken with caution and only after existing geological and soil conditions are known and considered. In areas subject to possible widespread major landsliding, only very low density development should be permitted, consistent with site investigations; grading in these areas should be restricted to minimal amounts required to provide access. (Source: Seismic Safety and Safety Element, pg. 7)

P5. All existing structures or features of structures which are hazardous in terms of damage, threat to life or loss of critical and essential function in the event of an earthquake should be, to the extent feasible, brought into conformance with applicable seismic and related safety (fire, toxic materials storage and use) standards through rehabilitation, reconstruction, demolition, or the reduction in occupancy levels or change in use. (Source: Seismic Safety and Safety Element, pg. 7, with a minor revision)

P6. The County shall not approve new development in areas with potential for seismic and geologic hazards unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis. The County shall review new development proposals in terms of the risk caused by seismic and geologic activity. (Source: ECAP, pg. 74)

P7. The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a natural disaster. (Source: ECAP, pg. 74)

P8. The County shall ensure that new major public facilities, including emergency response facilities (e.g., hospitals and fire stations), and water storage, wastewater treatment and communications facilities, are sited in areas of low geologic risk. (Source: ECAP, pg. 74)

P9. Site specific geologic hazard assessments, conducted by a licensed geologist, shall be completed prior to development approval in areas with landslide and liquefaction hazards as indicated in Figures S-2 and S-4 and for development proposals submitted in Alquist-Priolo Zones as indicated in Figure S-1, hazards to be mapped include:

- Seismic features
- Landslide potential
- Liquefaction potential

Mitigation measures needed to reduce the risk to life and property from earthquake induced hazards should be included. (Source: Eden Area Plan, pg. 8-11)

P10. Buildings shall be designed and constructed to withstand ground shaking forces of a minor earthquake (1-4 magnitude) without damage, of a moderate (5 magnitude) earthquake without structural damage, and of a major earthquake (6-8 magnitude) without collapse of the structure. The

County shall require that critical facilities and structures (e.g. hospitals, emergency operations centers) be designed and constructed to remain standing and functional following an earthquake. (Source: ECAP, pg. 75)

P11. All construction in unincorporated areas shall conform to the Alameda County Building Ordinance, which specifies requirements for the structural design of foundations and other building elements within seismic hazard areas.

P12. To the extent feasible, major infrastructure including transportation, pipelines, and water and natural gas mains, shall be designed to avoid or minimize crossings of active fault traces and to accommodate fault displacement without major damage that could result in long-term service disruptions. (Source: Eden Area Plan, pg. 8-12)

P13. The County shall encourage the retrofitting of existing structures and other seismically unsafe buildings and structures to withstand earthquake ground-shaking. (Source: Eden Area Plan, pg. 8-12)

P14. In order to minimize off-site impacts of hillside development, new construction on landslide-prone or potentially unstable slopes shall be required to implement drainage and erosion control provisions to avoid slope failure and mitigate potential hazards. (Source: Eden Area Plan, pg. 8-12)

Actions

A1. Require all new construction to meet the most current, applicable, lateral force requirements. (Source: Seismic Safety and Safety Element, pg. 6)

A2. Require applications for development within Alquist-Priolo Study Zones to include geological data that the subject property is not traversed by an active or potentially active fault, or that an adequate setback can be maintained between the fault trace and the proposed new construction. (Source: Seismic Safety and Safety Element, pg. 6)

A3. Require sites to be developed in accordance with recommendations contained in the soil and geologic investigations reports. (Source: Seismic Safety and Safety Element, pg. 6)

A4. Establish standards for areas previously in Alquist-Priolo Study Zones, and eliminated in the last update. (Source: Seismic Safety and Safety Element, pg. 6)

A5. Regulate, with collaboration from utility owners, the extension of utility lines in fault zones. (Source: Seismic Safety and Safety Element, pg. 6, with minor revisions)

A6. Establish (with collaboration from utility owners) and enforce design standards for transportation facilities and underground utility lines to be located in fault zones. (Source: Seismic Safety and Safety Element, pg. 6)

A7. Require soils and/or geologic reports for development proposed in areas of erodible soils and potential slope instability. (Source: Seismic Safety and Safety Element, pg. 7)

A8. Pursue programs to identify and correct existing structural hazards, with priority given to hazards in critical, essential and high occupancy structures and in structures built prior to the enactment of applicable local or state earthquake design standards. (Source: Seismic Safety and Safety Element, pg. 7)

A9. Support regional or statewide programs providing funding or technical assistance to local governments to allow identification of existing structural hazards in private development and providing assistance to public and private sectors to facilitate and to minimize the social and economic costs of hazards abatement. (Source: Seismic Safety and Safety Element, pg. 7)

A10. Continue to require the upgrading of buildings and facilities to achieve compliance with current earthquake bracing requirements as a condition of granting building permits for major additions and repairs. (Source: Seismic Safety and Safety Element, pg. 7)

A11. Continue, and as required, expand programs to provide the public information regarding seismic hazards and related structural hazards. (Source: Seismic Safety and Safety Element, pg. 7)

A12. Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas as identified by future studies by federal, state, and regional agencies.

Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location. (Source: Castro Valley Plan, pg. 10-30)

A13. Adopt and amend as needed the most current version of the California Building Code (CBC) to ensure that new construction and renovation projects incorporate Earthquake resistant design and materials that meet or exceed the current seismic engineering standards of the CBC. (Source: Castro Valley Plan, pg. 10-30, with minor revision)

A14. Periodically update detailed guidelines for preparation of site-specific geologic hazard assessments. These guidelines shall be prepared in consultation with the County Building Official, County Engineer, County Counsel, and the County Risk Manager and shall ensure that site-specific assessments for development requiring discretionary permits are prepared according to consistent criteria. (Source: Eden Area Plan, pg. 8-13, with revisions)

A15. Develop and implement an earthquake retrofit plan to reduce hazards from earthquakes. The plan should identify and tally the seismically unsafe buildings and structures, including unreinforced masonry, unreinforced concrete and soft-story buildings, and require inspection for these structures. It should also identify sources of funding to help reconstruct or replace inadequate structures and assist homeowners with earthquake retrofitting. (Source: Eden Area Plan, pg. 8-13)

A16. On sites with slopes greater than 30 percent, require all development to be clustered outside of the 30 percent slope area. (Source: Castro Valley Plan, pg. 10-31) With the exception that development22 upon any area outside of the Urban Growth Boundary where the slope exceeds 25% shall not be permitted. (Source: ECAP, pg. 74)

A17. Aspects of all development in hillside areas, including grading, vegetation removal and drainage, should be carefully controlled in order to minimize erosion, disruption to natural slope stability, and landslide hazards. The County's development standards and guidelines, permit application review process, Section 15.08.240 of its Building Ordinance, the Grading Erosion and Sediment Control Ordinance (Chapter 15.36 of the Alameda County General Ordinance Code), the Stormwater Management and Discharge Control Ordinance (Chapter 13.08), and Subdivision Ordinance (Title 16) shall serve to implement this policy.

Alameda County Code of Ordinances

In the Code of Ordinances, Chapter 15.08, *Building Code*, the County sets forth requirements for new construction in areas affected by seismic and geologic hazards. The code requires that project proponents submit soil and geotechnical reports before the County will permit construction of a foundation. In addition, Chapter 15.36, *Grading Erosion and Sediment Control*, known as the grading ordinance, sets forth requirements for grading, construction, and the control of erosion and sediments in order to safeguard human health and property, protect waterways, and ensure that the graded site is prepared in accordance with the general plan.

Alameda County Stormwater Management Plan

The Alameda Countywide Clean Water Program's Stormwater Management Plan for unincorporated Alameda County is discussed in Section 3.10, *Hydrology and Water Quality*.

Alameda County East County Area Plan

The ECAP sets forth the following goals, policies, and implementation programs to minimize the risks related to seismic hazards (Alameda County 2000) and open space.

Hazard Zones

Goal: To minimize the risks to lives and property due to environmental hazards.

Policy 134: The County shall not approve new development in areas with potential **natural hazards** (flooding, geologic, wildland fire, or other environmental hazards) unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis.

Policy 135: The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a **natural disaster**.

Environmental Hazards

Soil and Slope Stability

Goal: To minimize the risks to lives and property due to soil and slope instability hazards.

Policy 307: The County shall encourage Zone 7, cities, and agricultural groundwater users to limit the withdrawal of groundwater in order to minimize the potential for **land subsidence**.

Policy 308: The County shall not permit development within any area outside the Urban Growth Boundary exceeding 25 percent slopes to minimize hazards associated with slope instability.

Seismic and Geologic Hazards

Goal: To minimize the risks to lives and property due to seismic and geologic hazards.

Policy 309: The County shall not approve new development in areas with potential for seismic and geologic hazards unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis. The County shall review new development proposals in terms of the risk caused by seismic and geologic activity.

Policy 310: The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a **natural disaster.**

Policy 311: The County shall ensure that new major public facilities, including emergency response facilities (e.g., hospitals and fire stations), and water storage, wastewater treatment and communications facilities, are sited in areas of low geologic risk.

Policy 312: The County shall ensure that major transportation facilities and pipelines are designed, to the extent feasible, to avoid or minimize crossings of active fault traces and to accommodate fault displacement without major damage that could result in long-term disruption of service.

Policy 313: The County shall require development in **hilly areas** to minimize potential erosion and disruption of natural slope stability which could result from grading, vegetation removal, irrigation, and drainage.

Policy 314: The County shall prohibit the construction of any structure intended for human occupancy within 50 feet on either side of the Calaveras, Greenville, or Verona earthquake fault zones as defined by the Alquist-Priolo Earthquake Fault Zoning Act.

Policy 315: The County shall require that buildings be designed and constructed to withstand **groundshaking forces** of a minor earthquake without damage, of a moderate earthquake without structural damage, and of a major earthquake without collapse of the structure. The County shall require that critical facilities and structures (e.g., hospitals, emergency operations centers) be designed and constructed to remain standing and functional following an earthquake.

Implementation Programs:

Program 111: The County shall delineate areas within East County where the potential for geologic hazards (including seismic hazards, landslides, and liquefaction) warrants preparation of detailed site specific geologic hazard assessments. Areas shall be delineated based upon data from published sources and field investigations. Maps shall be maintained and updated as new data become available. These maps shall not be used by the County to determine where hazardous conditions exist, but instead to identify the presence of conditions which warrant further study.

Program 112: The County shall develop detailed guidelines for preparation of site-specific geologic hazard assessments. These guidelines shall be prepared in consultation with the County Building Official, the County Engineer, County Geologist, County Counsel, and the County Risk Manager, and shall ensure that site-specific assessments for development requiring discretionary permits are prepared according to consistent criteria.

General Open Space

Goal: To protect regionally significant open space and agricultural land from development

Policy 52: The County shall preserve open space areas for the protection of public health and safety, provision of recreational opportunities, production of natural resources (e.g., agriculture, wind power, and mineral extraction), protection of sensitive viewsheds, preservation of biological resources, and the physical separation between neighboring communities.

3.7.1.2 Environmental Setting

Topography

The project site is located in the Altamont Hills in the Diablo Range of the Coast Ranges. The Altamont Hills are situated between the eastern edge of Livermore Valley and the western edge of the San Joaquin Valley. The topography overall is moderately hilly and elevations on the project site range from less than 500 to more than 1,900 feet above sea level.

Geology

Regional

The project site is in the east-central portion of California’s Coast Ranges geomorphic province (e.g., Norris and Webb 1990: 359–363; California Geological Survey 2002: 3). The Coast Ranges province is characterized by an echelon (i.e., parallel to subparallel) northwest-trending mountain ranges formed by active uplift related to complex tectonics of the San Andreas fault/plate boundary system (Norris and Webb 1990: 359–380).

The eastern Coast Ranges are broadly antiformal (i.e., fold is convex, with oldest geologic units in the core). At the general latitude of the Project area, they consist of a central core of Mesozoic units—primarily the Cretaceous Panoche Formation—flanked on the east by an upward younging sequence of marine and terrestrial sedimentary units that include the San Pablo Formation, a Miocene fanglomerate, and Quaternary alluvial deposits (Wagner et al. 1991).

Local

The geology of the project site is shown in Figure 3.7-1. Graymer et al. have divided the geology of Alameda County into nine stratigraphic assemblages, each of which is a fault-bounded block. Assemblage VI and Surficial Deposits occur in the Project area.

Assemblage VI makes up most of the Project area. This assemblage is bounded by the Greenville fault to the west and the Carnegie fault to the south. The northern half of the assemblage is made up of the Great Valley Sequence, which consists primarily of sandstone and interbedded sandstone and shale of Cretaceous age. Underlying most of the Project area is Unit D of the Great Valley Sequence, a medium- to coarse-grained, light gray, clean sandstone. Along the eastern edge of the Unit D sandstone are the Neroly Sandstone, a blue sandstone of late Miocene age with minor conglomerate, and the Oro Loma Formation, a consolidated reddish silt, sand, and gravel. Underlying the road to the west are the Upper and Middle members of the Great Valley sequence Unit C sandstone and shale. The Upper member is a shale and siltstone and the Middle member is a biotite-rich wacke (Graymer et al. 1996: map, 11–13).

Surficial deposits of undivided Quaternary sediments occur in valleys and low-lying areas along the eastern margin of the Project area (Graymer et al. 1996: map, 6).

Seismicity

Primary Seismic Hazards

The State of California considers two aspects of earthquake events as primary seismic hazards: surface fault rupture (i.e., disruption of the Earth's surface as a result of fault activity) and seismic ground shaking.

Surface Fault Rupture

No active faults occur in the project site, but several are located near the project site. Alameda County is in a seismically active region and Alquist-Priolo earthquake fault zone maps have been prepared for much of the county (California Geological Survey 2015). One of these maps covers the portion of the project site that is in an Alquist-Priolo earthquake fault zone, but that fault, the Corral Hollow fault, is south of the project site. Other active faults near the project site are the Greenville fault zone, specifically the Marsh Creek-Greenville section, and the Los Positas fault (Figure 3.7-2) (California Geological Survey 2010).

The Midway fault occurs directly northeast of the project site near the San Joaquin County line. Although the USGS Quaternary Fault Database (2017) and California Geological Survey (2010) designate this fault as potentially active (i.e., experienced movement during the last 130,000 years), rather than active (i.e., experienced movement during the last 11,000 years). Although it is not recognized as active, work conducted by Unruh and Krug (2007:17) for USGS concluded "that the Midway fault is an active structure that primarily accommodates strike-slip displacement."

Although no CGS- or USGS-designated active faults occur within the project site, the risk of surface fault rupture is unknown because of the presence of the Corral Hollow and the Midway fault close to the project site.

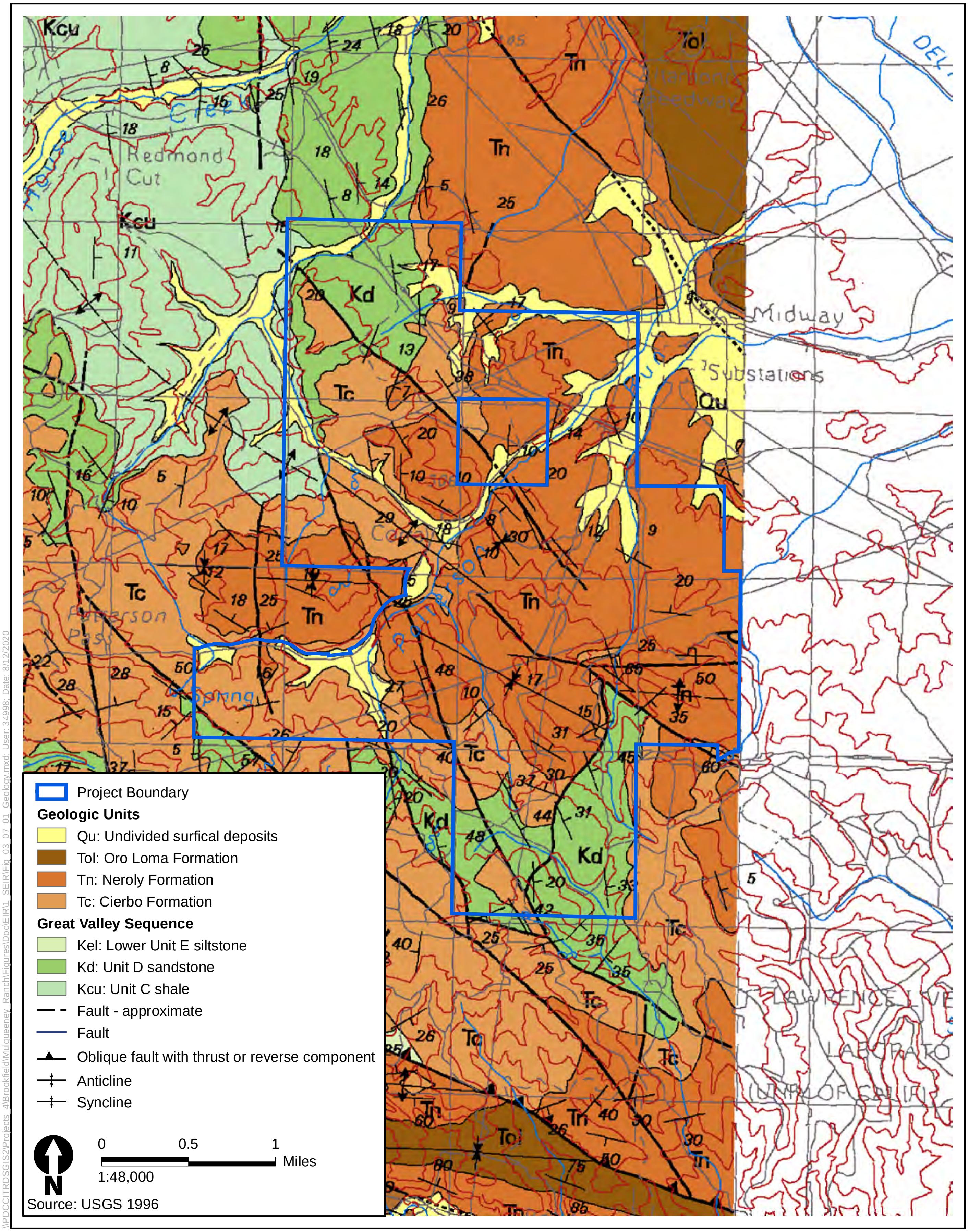

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Figure 3.7-1
Geologic Units in the Project Area

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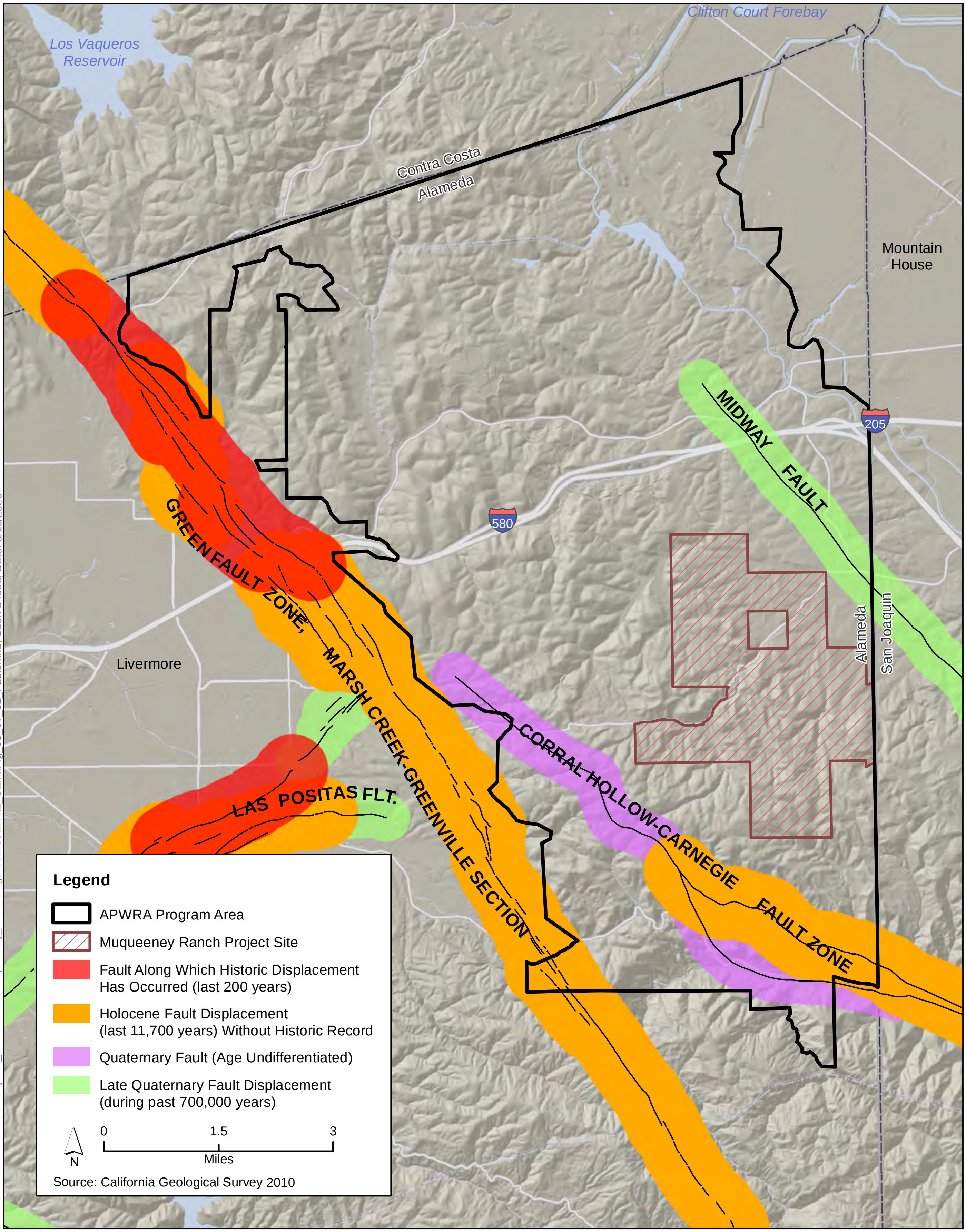

Figure 3.7-2
Fault Map

Seismic Ground Shaking

Unlike surface rupture, ground shaking is not confined to the trace of a fault, but rather ground shaking propagates into the surrounding areas during an earthquake. The intensity of ground shaking typically diminishes with distance from the fault, but ground shaking may be locally amplified and/or prolonged by some types of substrate materials. These factors are used to map the probabilistic shaking hazards throughout the state.

Based on the probabilistic seismic hazard map, which depicts the peak horizontal ground acceleration values exceeded at a 2% probability in 50 years (California Geological Survey 2008b, 2016), the acceleration value for the project site indicates a moderate ground-shaking hazard (Figure 3.7-3).

Secondary Seismic Hazards

Secondary seismic hazards are seismically induced landslide, liquefaction, and related types of ground failure events. As discussed in *Regulatory Setting* in Section 3.7.1, *Existing Conditions*, the State of California maps areas that are subject to secondary seismic hazards pursuant to the Seismic Hazards Mapping Act. These hazards are addressed briefly below based on available information.

Landslide and Other Slope Stability Hazards

Just west of the project site is a designated Zone of Required Investigation for landslide hazard. This zone is in earthquake-induced landslide hazard zones (California Geological Survey 2009a and b) (Figure 3.7-4). The landslide zones tend to be concentrated in areas where the slopes are steeper and/or rock strengths are weaker. Numerous historically active landslides occur along the Greenville fault. Many of the moderate to large rockslides are underlain by the Miocene units of the Neroly Sandstone (Tn), Oro Loma Formation (Tol), and Tesla Formation (Tte), and also the Cierbo Sandstone (Tc) but to a lesser extent. Steep slopes and proximity to faults appear to be the predominant causes of landsliding in the area (California Geological Survey 2009a: v and Section 2, pages 31–32).

Although the project site is not in an earthquake-induced landslide hazard zone (California Geological Survey 2015), several factors make slope instability (both seismically and nonseismically induced) a concern in this area. These factors include the steep topography, the potential for moderate ground shaking, the presence of the Neroly Sandstone, and the proximity to areas designated as landslide hazard zones. In addition, slope stability related to precipitation is also factor in the Project area (see *Slope Stability [Nonseismic-Related]*, below).

Liquefaction and Related Ground Failure

Liquefaction is the process in which soils and sediments lose shear strength and fail during seismic ground shaking. The vibration caused by an earthquake can increase pore pressure in saturated materials. If the pore pressure is raised to be equivalent to the load pressure, this causes a temporary loss of shear strength, allowing the material to flow as a fluid. This temporary condition can result in severe settlement of foundations and slope failure. The susceptibility of an area to liquefaction is determined largely by the depth to groundwater and the properties (e.g., grain size, density, degree of consolidation) of the soil and sediment within and above the groundwater. The sediments most susceptible to liquefaction are saturated, unconsolidated sand and silt within 40 feet of the ground surface. According to the CGS report prepared for the adjacent Altamont quadrangle, CGS evaluations focus on areas covered by Quaternary (less than about 1.6 million years) sedimentary deposits (California Geological Survey 2009a: Section1, pages 2–4). Improperly compacted artificial fill may also be susceptible to liquefaction.

The liquefaction hazard in most of the project site area is likely low. No liquefaction hazard zones are mapped in the project site (Figure 3.7-4), and the depth to groundwater in the foothills, which are outside the groundwater basin, is generally greater than 60 feet (California Geological Survey 2009a: Section 1, page 9). In addition, the ages of the rock units in the project site are generally older than most liquefiable sediments. However, the Quaternary sediments in valleys may be less consolidated and shallow groundwater may be present. Therefore, these areas may be more susceptible to liquefaction.

Other types of ground failure related to liquefaction include lateral spreading and differential settlement. Lateral spreading is a failure of soil/sediment within a nearly horizontal zone that causes the soil to move toward a free face (such as a streambank or canal) or down a gentle slope. Lateral spreading can occur on slopes as gentle as 0.5%. Even a relatively thin layer of liquefiable sediment can create planes of weakness that could cause continuous lateral spreading over large areas (California Geological Survey 2008a: 36).

The potential for lateral spreading in the project site is unknown.

Differential settlement—the uneven settling of soil—is the most common fill displacement hazard (California Geological Survey 2008a: 49). The potential for differential settlement is unknown because its determination requires site-specific testing.

Slope Stability (Nonseismic-Related)

Nonseismic-related landsliding is common in the Altamont Pass Wind Resource Area.

In 1998, heavy rainfall caused widespread landsliding in the 10-county San Francisco Bay Area region. As a result, USGS geologists conducted a landslide inventory of the affected counties, including Alameda County. Figure 3.7-5 shows the landslides that were mapped in and near the Project area. However, because of the extent of the landsliding, only landslides associated with damage to the built environment were mapped (U.S. Geological Survey 1999: 2 and map). Because the project site is in a rural area, many landslides are not shown.

In addition, the wide extent of landsliding in and around the project site is further exemplified by the omission of landslides from the bedrock geologic map of Alameda County "because they are so numerous they would conceal much of the information on bedrock geology" (Graymer et al. 1996:6).

Soils

Two soils associations underly the entirety of the project site (Figure 3.7-6). Table 3.7-1 summarized important issues of concern related to suitability or construction. The primary issue of concern is the shrink-swell potential of the soils (i.e., linear extensibility or expansiveness). Many of the soils that make up the Fontana-Diablo-Altamont soil association, which occurs over most of the project site, have a high shrink-swell potential. The soils that make up the Carbona-Calla soil association have a moderate to very high shrink-swell potential. Some soils of the Fontana-Diablo-Altamont soil association are susceptible to water erosion. (Natural Resources Conservation Service 2016).

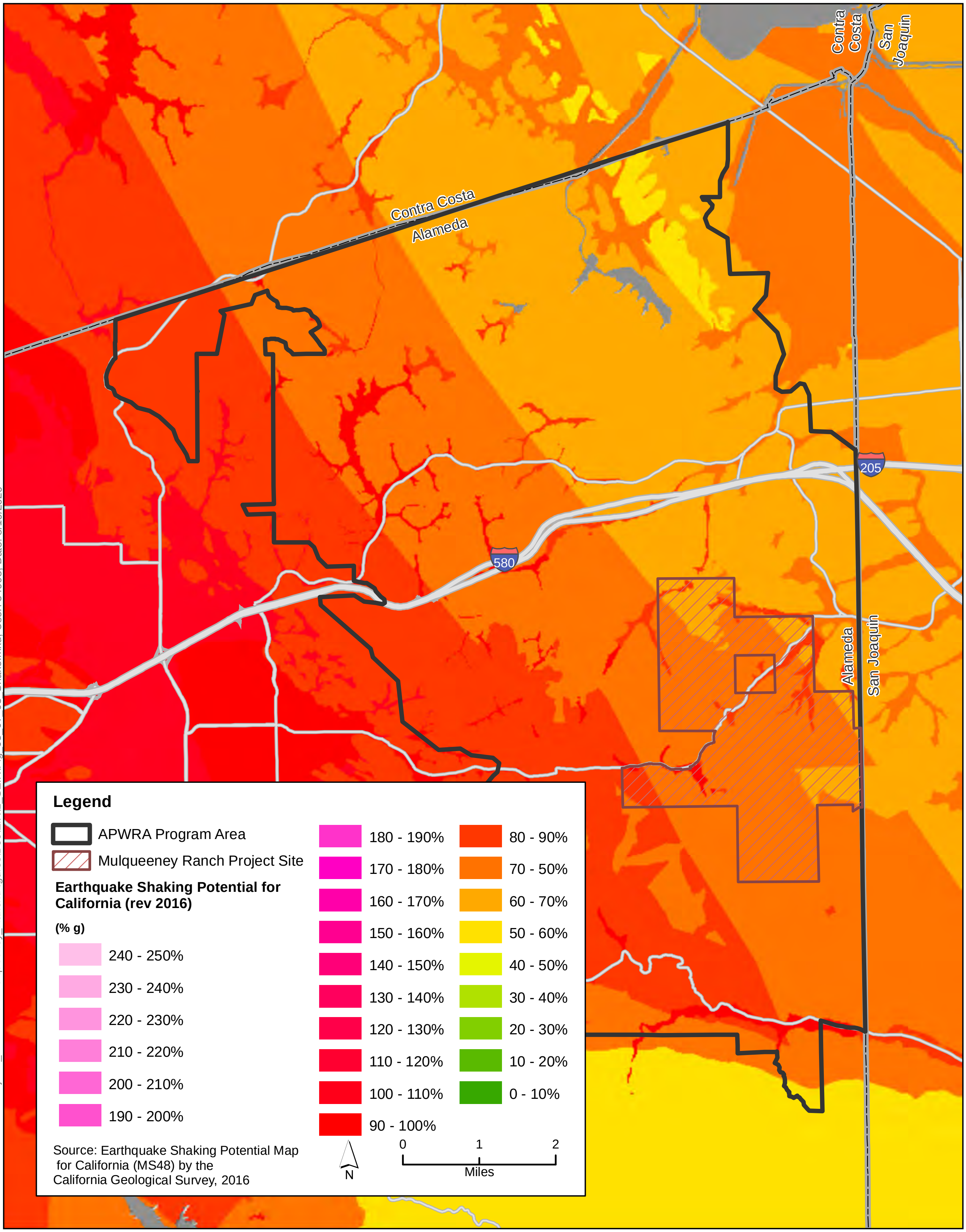

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Figure 3.7-3
Probabilistic Seismic Hazards Map (Seismic Shaking)

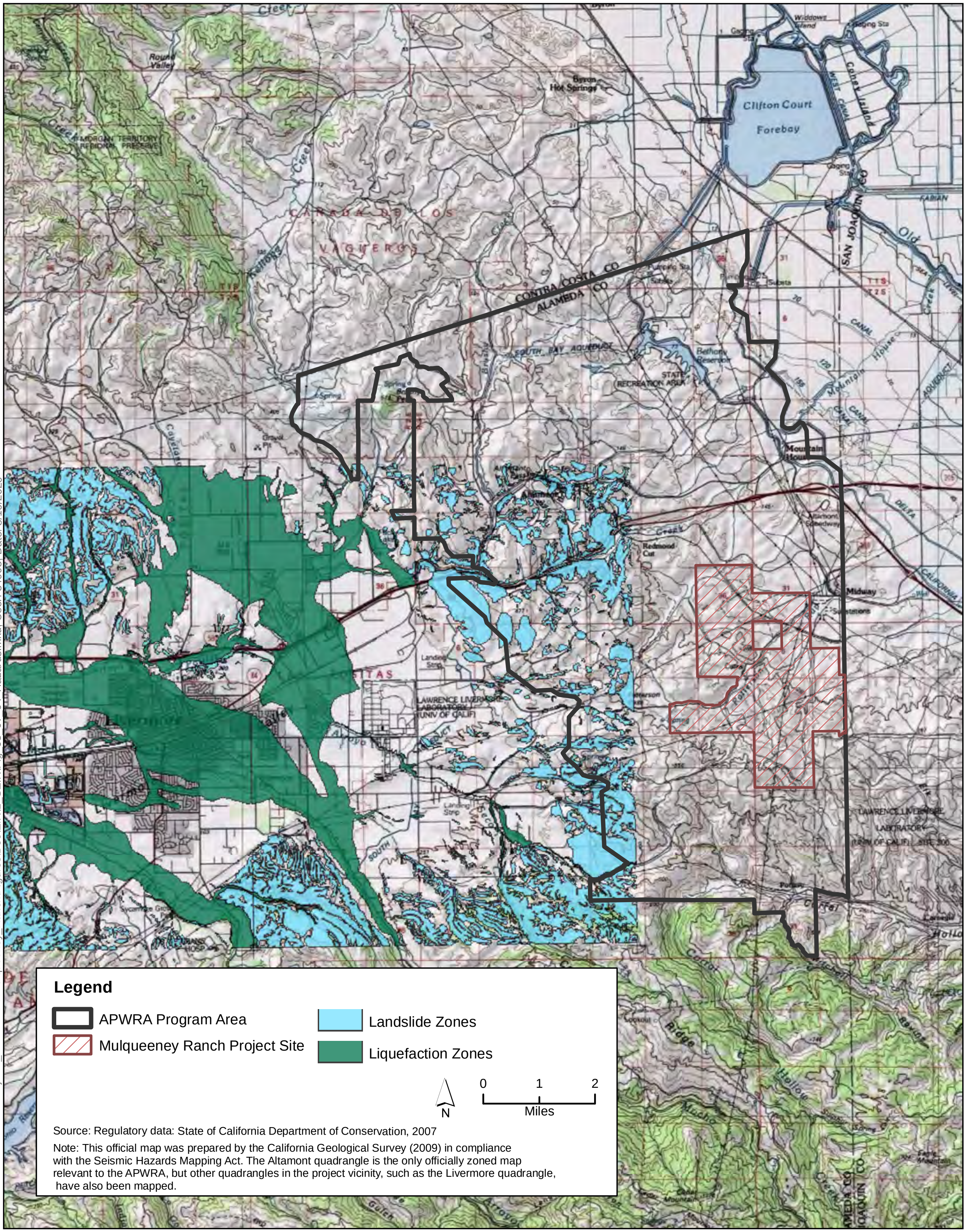

Figure 3.7-4
Seismic Hazard Zone Map

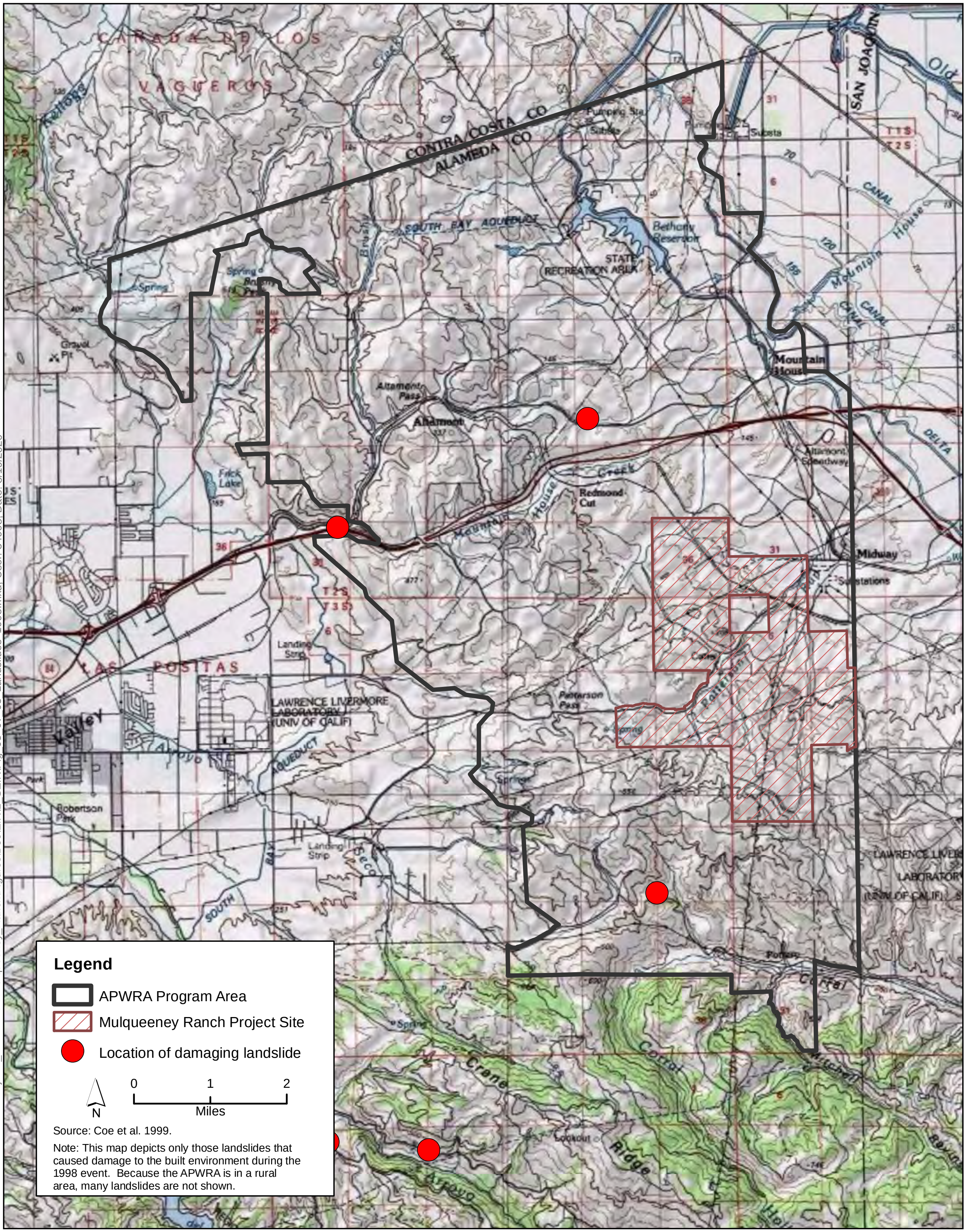

Figure 3.7-5
Landslides Causing Damage to the Built Environment during Heavy Rain Event in 1998

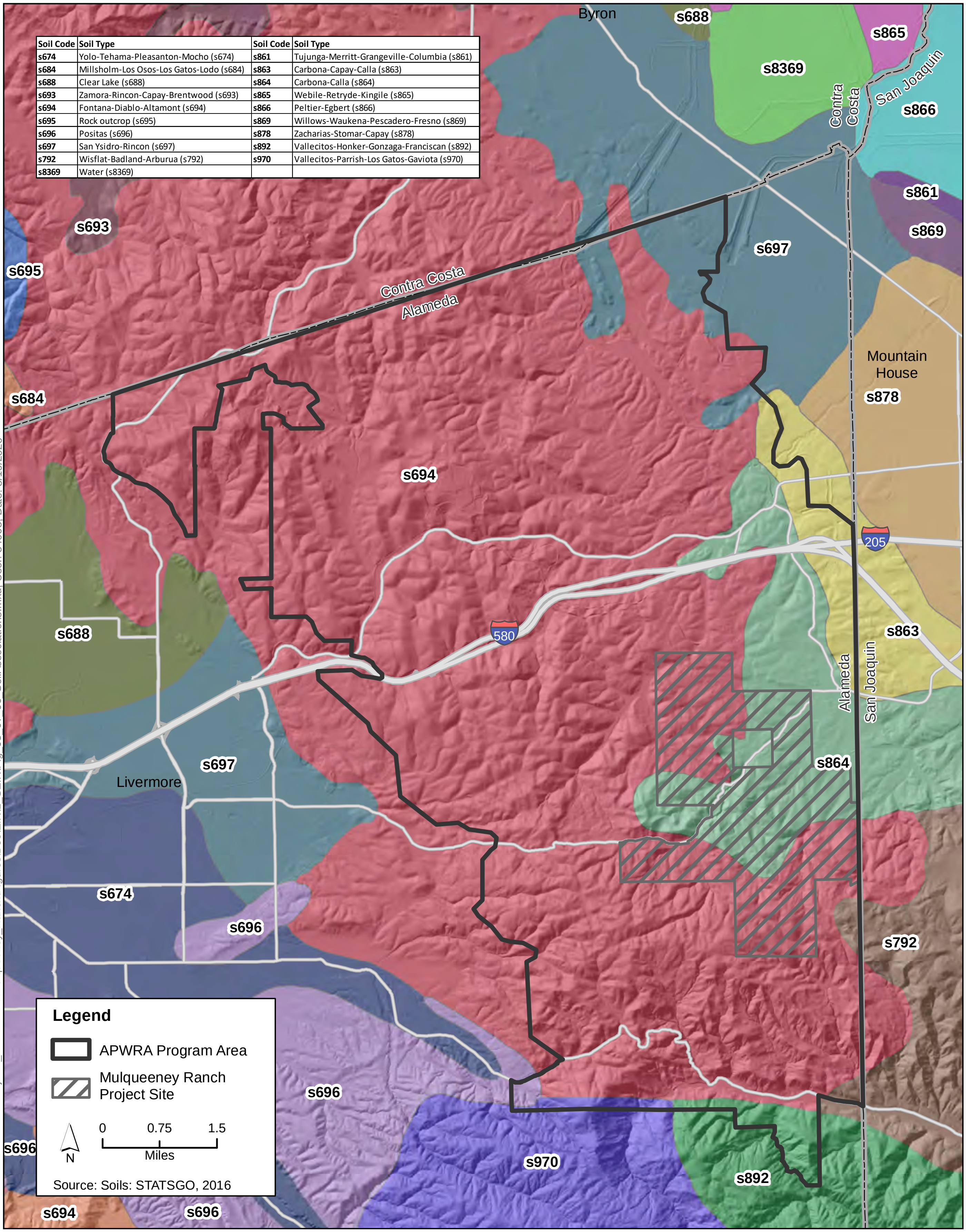

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Figure 3.7-6
Soil Associations Map

Table 3.7-1. General Characteristics of Soil Associations in the Program Area

Map Symbol	Soil Association	Location and Characteristics
s694	Fontana-Diablo-Altamont	Dominant soil association in the project site. Most soils in this association have a high shrink-swell potential. Some soils in this association have a higher susceptibility to water erosion.
s864	Carbona-Calla	Occurs in the east and center of the project site. Most soils in this association have a moderate to very high shrink-swell potential.

Source: Natural Resources Conservation Service 2016.

Mineral Resources

There are no known mineral resources in the project site. According to the California Division of Mines and Geology land classification map prepared for the South San Francisco Bay Production-Consumption (P-C) Region, which includes Alameda County, there no areas designated as MRZ-2 (Kohler-Antablin 1996: Plate 17). No mining is known to occur in the area (California Division of Mine Reclamation 2019). In addition, the general plan does not identify mineral resources in the project site.

Paleontological Resources

Paleontological sensitivity is a qualitative assessment based on the paleontological potential of the stratigraphic units present, the local geology and geomorphology, and other factors relevant to fossil preservation and potential yield. According to the Society of Vertebrate Paleontology (SVP) (2010), standard guidelines for sensitivity are (1) the potential for a geological unit to yield abundant or significant vertebrate fossils or to yield a few significant fossils, large or small, vertebrate, invertebrate, or paleobotanical remains and (2) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecological, or stratigraphic data (Table 3.7-2).

Table 3.7-2. Paleontological Sensitivity Ratings

Potential	Definition
High	Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources…Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data.
Undetermined	Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources.

Potential	Definition
Low	Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus, will only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule.
No	Some rock units, such as high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites), have no potential to contain significant paleontological resources. Rock units with no potential require neither protection nor impact mitigation measures relative to paleontological resources.

Source: Society of Vertebrate Paleontology 2010.

Most of the geologic units in the Project area are highly sensitive for paleontological resources, based primarily on rock type. The Great Valley Sequence contains units with a diverse assemblage of invertebrates, plus marine reptiles and numerous types of plants (Paleo Portal 2013). Great Valley Sequence members in the Project area include Unit D (sandstone), Upper Unit C (shale), and Middle Unit C (sandstone) (Kd, Kcu, and Kcm on Figure 3.7-1).

The Miocene Neroly Formation is also sensitive for paleontological resources based on the University of California Museum of Paleontology (UCMP) database, which contains four records of mammal fossils in this unit (University of California Museum of Paleontology 2020a). The UCMP database also shows that the Cierbo Formation contains invertebrate fossils (University of California Museum of Paleontology 2020b). The paleontological sensitivity of the Cierbo Formation should be considered high given its depositional environment and age.

The UCMP database contains 6,316 records of vertebrate fossils in Alameda County. However, most of these records are from geologic units not found in the Project area. (University of California Museum of Paleontology 2020c).

3.7.2 Environmental Impacts

This section presents the impact analysis of project effects related to geology, soils, and paleontological resources. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate significant impacts accompany each discussion of those impacts.

3.7.2.1 Methods for Analysis

Evaluation of the geology and soil impacts in this section is based on information from published maps, reports, and other documents that describe the geologic, seismic, soil, and mineral resource conditions of the project site, and on professional judgment. The analysis assumes that the project proponents will conform to the latest CBSC standards, county general plan seismic safety standards, county grading ordinance, and NPDES requirements.

The primary source of information used in developing the paleontological resources section is the paleontological database at UCMP. Effects on paleontological resources were analyzed qualitatively on a large-scale level, based on professional judgment and the SVP guidelines below.

SVP's *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* provides standard guidelines that are widely followed (Society of Vertebrate Paleontology 2010). These guidelines reflect the accepted standard of care for paleontological resources. The SVP guidelines identify two key phases in the process for protecting paleontological resources from Project impacts.

- Assess the likelihood that the area contains significant nonrenewable paleontological resources that could be directly or indirectly impacted, damaged, or destroyed as a result of the Project.
- Formulate and implement measures to mitigate potential adverse impacts.

An important strength of SVP's approach to assessing potential impacts on paleontological resources is that the SVP guidelines provide some standardization in evaluating paleontological sensitivity. Table 3.7-3 defines the SVP's sensitivity categories for paleontological resources and summarizes SVP's recommended treatments to avoid adverse effects in each sensitivity category.

No new field work, research, or engineering level design was conducted for the preparation of this EIR.

Table 3.7-3. Society of Vertebrate Paleontology's Recommended Treatment for Paleontological Resources

Sensitivity Category	Mitigation Treatment
High or Undetermined	• An intensive field survey and surface salvage prior to earthmoving, if applicable. • Monitoring by a qualified paleontological resource monitor of excavations. • Salvage of unearthed fossil remains and/or traces (e.g., tracks, trails, burrows). • Screen washing to recover small specimens, if applicable. • Preliminary survey and surface salvage before construction begins. • Preparation of salvaged fossils to a point of being ready for curation (i.e., removal of enclosing matrix, stabilization and repair of specimens, and construction of reinforced support cradles where appropriate). • Identification, cataloging, curation, and provision for repository storage of prepared fossil specimens. • A final report of the finds and their significance.
Low or no	Rock units with low or no potential typically will not require impact mitigation measures to protect fossils.

Source: Society of Vertebrate Paleontology 2010.

3.7.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving any of the following.
    - 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).

  - Strong seismic ground shaking.
  - Seismic-related ground failure, including liquefaction.
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Be located on expansive soil, creating substantial direct or indirect risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater.
- 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.
- 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.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

The project would not include groundwater or natural gas pumping and therefore would not cause subsidence (i.e., the lowering of the land surface as a result of groundwater or natural gas withdrawal). Therefore, this topic was dismissed from further discussion and there is no need to address impacts related to this CEQA checklist criterion.

The PEIR concluded that APRWA repowering projects would not include installation of septic systems or alternative wastewater disposal. The project is consistent with this analysis in the PEIR because it does not include septic systems or alternative wastewater disposal. Therefore there is no need to address impacts related to this CEQA checklist criterion.

In addition, the PEIR concluded that APRWA repowering projects would not affect mineral resources because there are no known mineral resources in the project site and no mining is known to occur in the area. Therefore, there is no need to address impacts related to this CEQA checklist criterion.

3.7.2.3 Impacts and Mitigation Measures

Project Impacts

Impact GEO-1: Potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides (less than significant with mitigation)

The project would replace approximately 518 old generation wind turbines with 36 new generation wind turbines on 29 privately-owned parcels within the Altamont Pass Wind Resource Area (APWRA). While no faults have been recorded within the project site, the site lies within a seismically active area with active faults in the immediate vicinity. The Corral Hollow Fault, the Marsh Creek Greenville Section of the Greenville Fault Zone, and the Las Positas Fault all lie west of the project site and are considered active and have experienced fault displacement within the last 15,000 years. The Midway fault is located directly northeast of the project site, and has been designated as a potentially active (rather than active) fault (i.e., active during the last 130,000 years) by the USGS Quaternary Fault Database (2017) and California Geological Survey (2010); however, work conducted by Unruh and Krug (2007:17) for USGS concluded "that the Midway fault is an active structure that primarily accommodates strike-slip displacement."

If a turbine were constructed on or near a fault, rupture of that fault could damage a turbine or cause harm to personnel on the site. The turbine could be damaged or collapse and possibly injure personnel or property in the immediate area. However, no identified faults are located within the project site, and as no structures would be built on an identified fault or fault zone, no impacts beyond those identified in the PEIR would result. Implementation of PEIR Mitigation Measure GEO-1, *Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact. Implementation of PEIR Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level.

As disclosed in the PEIR, construction of turbines or power collection systems in areas with the potential to experience strong ground shaking could expose people or structures to potential substantial adverse effects. Strong ground shaking could also result in earthquake-induced ground failure liquefaction, landsliding, lateral spread, or differential settlement. The turbine could be damaged or collapse and possibly injure personnel or damage property in the immediate area. Implementation of PEIR Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level. The site-specific geotechnical report would assess the potential for geologically related impacts and recommend locations for siting project features (e.g., turbines). This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

In addition to seismic-related ground failure discussed in preceding impacts, construction of turbines or power collection systems in areas with potential to experience non-seismic-related landsliding caused by heavy precipitation could also expose people or structures to potential substantial adverse effects. Damage or collapse resulting from landsliding could cause harm to personnel or property in the immediate area, as disclosed in the PEIR.

Although the project must comply with existing building safety requirements, these requirements may not address all ground failure issues. Implementation of PEIR Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure GEO-1: Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report

Prior to construction activities at any site, the project proponent will retain a geotechnical firm with local expertise in geotechnical investigation to prepare a site-specific geotechnical report. This report will be prepared by a licensed geotechnical engineer or engineering geologist and will be submitted to the County building department as part of the approval process. This report will be based on data collected from subsurface exploration, laboratory testing of samples, and surface mapping and will address the following issues.

- Potential for surface fault rupture and turbine site location: The geotechnical report will investigate the Greenville, Corral Hollow-Carnegie, and the Midway faults (as appropriate to the location) and determine whether they pose a risk of surface rupture. Turbine foundations and power collection systems will be sited according to recommendations in this report.
- Strong ground shaking: The geotechnical report will analyze the potential for strong ground shaking at the project site and provide turbine foundation design recommendations, as well as recommendations for power collection systems.
- Slope failure: The geotechnical report will investigate the potential for slope failure (both seismically and nonseismically induced) and develop site-specific turbine foundation and power collection system plans engineered for the terrain, rock and soil types, and other conditions present at the project site in order to provide long-term stability.
- Expansive soils: The geotechnical report will assess the soil types at the project site and determine the best engineering designs to accommodate the soil conditions.
- Unstable cut or fill slopes: The geotechnical report will address geologic hazards related to the potential for grading to create unstable cut or fill slopes and make site-specific recommendations related to design and engineering.

Impact GEO-2: Potential to result in substantial soil erosion or the loss of topsoil (less than significant)

As disclosed in the PEIR, decommissioning and project construction could cause surface disturbance and vegetation removal resulting in soil erosion. As discussed in Chapter 2, *Project Description*, under Temporary and Permanently Disturbed Land, the project would result in 38.7 acres of permanently disturbed land and 235.8 acres of temporary disturbed land. Some soils within the project site included in the Fontana-Diablo-Altamont soil association are susceptible to water erosion. Therefore, the project has the potential to result in soil erosion or loss of topsoil.

However, because the project would disturb more the 1 acre, it would require coverage under the state's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities which would require the preparation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would include erosion-prevention measures such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover. In addition, a Reclamation/Restoration Plan would be developed prior to construction as part of the construction planning and permitting process which would include specific measures to ensure that the project site is regraded and seeded to pre-project conditions. These requirements would ensure that potential impacts of soil erosion would be less than significant, and no mitigation is required.

Impact GEO-3: Placement of Project-related facilities on a geologic unit or soil that is unstable or that would become unstable as a result of the Project and potentially result in an onsite or

offsite landslide, lateral spreading, subsidence, liquefaction, or collapse (less than significant with mitigation)

In addition to seismic-related ground failure discussed in Impact Geo-1 (e.g., lateral spreading and liquefaction), construction of turbines or power collection systems in areas with potential to experience non-seismic-related landsliding caused by heavy precipitation could also expose people or structures to potential substantial adverse effects. Damage or collapse resulting from landsliding could cause harm to personnel or property in the immediate area, as disclosed in the PEIR.

While the project site is not located in an earthquake-induced landslide hazard zone, the hilly topography, the site's proximity to active faults and designated landslide hazard zones, and the presence of the Neroly Sandstone, make slope instability a concern at the project site.

Although the project must comply with existing building safety requirements, these requirements may not address all ground failure issues. Implementation of PEIR Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level by requiring a site-specific geotechnical report and implementation of its recommendations. This report would assess the potential for geologically related impacts and recommend locations for siting project features (e.g., turbines). Adherence to recommendations included in the geotechnical report would ensure that potential impacts of related to the placement of turbine or power collection systems on a potentially unstable geologic unit or soil would be less than significant.

PEIR Mitigation Measure GEO-1: Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report

Impact GEO-4: Placement of Project-related facilities on expansive soil, creating substantial direct or indirect risks to life or property (less than significant with mitigation)

The PEIR disclosed that expansive soils occur in much of the APWRA. The project site is underlain by the Fontana-Diablo-Altamont association, which has a high shrink-swell potential, and Carbona-Calla soil, which as a moderate to very high shrink-swell potential. Turbine foundations built on expansive soils would be subject to the shrink and swell of these soils, which could damage structures if the subsoil, drainage, and foundation are not properly engineered. However, soil sampling and treatment procedures are addressed by state and local building codes. Treatment of expansive soil may include removing the expansive soil and replacing it with non-expansive soil, incorporating additives, and installing specially designed foundations. Compliance with these codes and implementation of PEIR Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level by removing or treating the expansive soil or designing foundations to counteract the expansion.

PEIR Mitigation Measure GEO-1: Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report

Impact GEO-5: Direct or indirect destruction of a unique paleontological resource or site or unique geologic feature (less than significant with mitigation)

If fossils are present in the Project area, they could be damaged by during earth-disturbing activities during construction, such as excavation for foundations, placement of fills, trenching for power collection systems, and grading for roads and staging areas. The more extensive and deeper the earth-disturbing activity, the greater the potential for damage to paleontological resources.

The Neroly Formation and some units of the Great Valley Sequence are known to contain vertebrate fossils. Substantial damage to or destruction of significant paleontological resources as defined by the Society of Vertebrate Paleontology (2010) would be a significant impact.

Because most geologic units in the project area are likely to be sensitive for paleontological resources, excavation in these units could damage paleontological resources.

This impact would be significant, but implementation of PEIR Mitigation Measures GEO-7a, *Retain a qualified professional paleontologist to monitor significant ground-disturbing activities*; GEO-7b, *Educate construction personnel in recognizing fossil material*; and GEO-7c, *Stop work if substantial fossil remains are encountered during construction*, would reduce this impact to a less-than-significant level by requiring an onsite qualified paleontologist to monitor, protect, and recover fossils during construction activities and training construction personnel to recognize fossils and take appropriate steps to protect them if a paleontologist is not present.

PEIR Mitigation Measure GEO-7a: Retain a qualified professional paleontologist to monitor significant ground-disturbing activities

The applicant will retain a qualified professional paleontologist as defined by the SVP's *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (2010) to monitor activities with the potential to disturb sensitive paleontological resources. Data gathered during detailed Project design will be used to determine the activities that will require the presence of a monitor. In general, these activities include any ground-disturbing activities involving excavation deeper than 3 feet in areas with high potential to contain sensitive paleontological resources. Recovered fossils will be prepared so that they can be properly documented. Recovered fossils will then be curated at a facility that will properly house and label them, maintain the association between the fossils and field data about the fossils' provenance, and make the information available to the scientific community.

PEIR Mitigation Measure GEO-7b: Educate construction personnel in recognizing fossil material

The applicant will ensure that all construction personnel receive training provided by a qualified professional paleontologist experienced in teaching non-specialists to ensure that they can recognize fossil materials in the event any are discovered during construction.

PEIR Mitigation Measure GEO-7c: Stop work if substantial fossil remains are encountered during construction

If substantial fossil remains (particularly vertebrate remains) are discovered during earth disturbing activities, activities within 100 feet of the find will stop immediately until a state-registered professional geologist or qualified professional paleontologist can assess the nature and importance of the find and a qualified professional paleontologist can recommend appropriate treatment. Treatment may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection and may also include preparation of a report for publication describing the finds. The applicant will be responsible for ensuring that recommendations regarding treatment and reporting are implemented.

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3.8 Greenhouse Gas Emissions

This section provides an overview of the regulatory framework applicable to greenhouse gas (GHG) emissions at the statewide, regional, and local scales, evaluates the potential environmental impacts associated with implementation of the project, and provides mitigation measures that would serve to reduce or avoid significant impacts where feasible. GHG emissions refer to airborne pollutants that affect global climate conditions. These gaseous pollutants have the effect of trapping heat in the atmosphere, and consequently altering weather patterns and climactic conditions over long time-scales. Consequently, unlike other resource areas that are primarily concerned with localized project impacts (e.g., within 1,000 feet of the project site), the global nature of climate change requires a broader analytic approach. Accordingly, while the GHG analysis focuses on emissions generated at the project site, the climate change study area includes the global context.

3.8.1 Existing Conditions

3.8.1.1 Regulatory Setting

This section summarizes the federal, state, and local regulations related to GHG emissions that are applicable to the project.

Federal Regulations

The United States Environmental Protection Agency (EPA) has issued an endangerment finding and cause or contribute finding for six key well-mixed GHGs—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). The EPA has also issued the Greenhouse Gas Reporting Rule, which sets CO_2-based permitting criteria for certain industrial facilities. The Obama administration developed the Clean Power Plan in August 2015 to reduce CO_2 emission from electric power generation by 32 percent within 25 years, relative to 2005 levels. However, on February 9, 2016, the Supreme Court stayed implementation of the Clean Power Plan pending judicial review, which is still ongoing as of this analysis. As discussed in Section 3.3, *Air Quality*, the National Highway Traffic Safety Administration (NHSTA) and EPA have also proposed limits on future light-duty vehicle emission standards via the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule.

State Regulations

California has established various regulations to address GHG emissions. The most relevant of these regulations are described below.

Legislative Reduction Targets

Assembly Bill (AB) 32 (Chapter 488, Statutes of 2006), known as the Global Warming Solutions Act of 2006, requires the state to reduce GHG emissions to 1990 levels by 2020. Senate Bill (SB) 32 (passed in 2016) requires the state to reduce emissions to 40 percent below the 1990 level by 2030. The State's plan to reach these targets are presented in periodic scoping plans. The California Air Resources Board (CARB) adopted the *2017 Climate Change Scoping Plan* (2017 Scoping Plan) in November 2017 to meet the GHG reduction requirement set forth in SB 32 (California Air Resources

Board 2017a). It proposes continuing the major programs of the previous AB 32 Scoping Plan, including cap-and-trade regulation; low carbon fuel standards; more efficient cars, trucks, and freight movement; Renewables Portfolio Standard (RPS); and reducing methane emissions from agricultural and other wastes. The 2017 Scoping Plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state.

Executive Orders

In 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, which established goals to reduce California's GHG emissions to (1) 2000 levels by 2010 (achieved); (2) 1990 levels by 2020; and (3) 80 percent below the 1990 levels by 2050. Signed in 2017, EO S-01-07 mandates: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020; and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California. In 2018, Governor Jerry Brown signed EO B-55-18, which established a state goal to achieve carbon neutrality as soon as possible, and no later than 2045, and to achieve and maintain net negative emissions thereafter. Executive orders are legally binding only on state agencies. Accordingly, the orders guide state agencies' efforts to control and regulate GHG emissions but has no direct, binding effect on local government or private actions

Renewables Portfolio Standard

SBs 1078 (2002), 107 (2006) 2 (2011) and 100 (2015) govern California's RPS under which investor-owned utilities, energy service providers, and Community Choice Aggregators must procure additional retail sales per year from eligible renewable sources. The current goals for renewable sources (as outlined under SB 100 in 2015) are 33 percent by 2020, 40 percent by 2024, 50 percent by 2026, and 60 percent by 2030. SB 100 further requires all electricity come from zero-carbon sources by 2045.

Vehicle Efficiency Standards and Rules

Additional strengthening of the Pavley I standards (referred to as the *Advanced Clean Cars* measure) was adopted for vehicle model years 2017–2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon in 2025. However, as noted above and discussed in Section 3.3, *Air Quality*, the federal SAFE Vehicles Rule proposes to freeze national fuel economy standards and revoke California's ability to set statewide standards.

As discussed in Section 3.3, *Air Quality*, CARB adopted the Advanced Clean Truck Regulation in June 2020 to accelerate a large-scale transition of zero-emission medium-and-heavy-duty vehicles. The regulation requires the sale of zero-emission medium-and-heavy-duty vehicles as an increasing percentage of total annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. By 2045, every new medium-and-heavy-duty truck sold in California will be zero-emission.

Short-Lived Climate Pollutants Reduction Strategy

SB 605 directed CARB, in coordination with other State agencies and local air districts, to develop a comprehensive Short-Lived Climate Pollutants (SLCP) Reduction Strategy. SB 1383 directed CARB to approve and implement the SLCP Reduction Strategy to achieve reductions in CH_4, HFC gases, and anthropogenic black carbon. SB 1383 also establishes targets for reducing organic waste in landfills and methane emissions from dairy and livestock operations. CARB adopted the SLCP Reduction Strategy in March 2017 as a framework for achieving the CH_4, HFC, and anthropogenic black carbon reduction targets set by SB 1383 (California Air Resources Board 2017b). The SLCP Reduction Strategy includes 10 measures to reduce SLCPs, which fit within a wide range of ongoing planning efforts throughout the state.

Regional and Local Regulations

The 2017 Scoping Plan does not provide an explicit role for local air districts in implementing AB 32 and SB 32, but it does state that CARB will work actively with air districts in coordinating emissions reporting, encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting as well as through their role as CEQA lead or commenting agency, the establishment of CEQA thresholds, and the development of analytical requirements for CEQA documents.

The project site falls under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), but some emissions would occur in areas under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Applicable plans and regulations from the air districts, as well as local GHG reduction plans, are presented below.

Bay Area Air Quality Air Quality Management District

In May 2017, the BAAQMD (2017) adopted an update to its *CEQA Air Quality Guidelines*, which includes operational significance thresholds for GHG emissions (which were previously included in the 2010/2011 and 2012 guidelines). BAAQMD recommends that the following measures be incorporated into all projects to reduce construction generated emissions.

- Use alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment for at least 15% of the fleet.
- Use at least 10% local building materials.
- Recycle or reuse at least 50% of construction waste or demolition materials.

San Joaquin Air Pollution Control District

SJVAPCD's (2015) *Guidance for Assessing and Mitigating Air Quality Impacts* includes guidance to assist lead agencies in determining the level of significance of operation related GHG emissions pursuant to CEQA. SVJAPCD's GHG guidance is intended to streamline CEQA review by pre-quantifying emissions reductions that would be achieved through the implementation of best performance standards (BPS). Projects are considered to have a less-than-significant cumulative impact on climate change if any of the following conditions are met.

- Comply with an approved GHG reduction plan.
- Achieve a score of at least 29 using any combination of approved operational BPS[1].

[1] A score of 29 represents a 29% reduction in GHG emissions relative to unmitigated conditions (1 point = 1%). This goal is consistent with the reduction targets established by AB 32.

- Reduce operational GHG emissions by at least 29% over business-as-usual conditions (demonstrated quantitatively).

SJVAPCD guidance recommends quantification of GHG emissions for all projects in which an EIR is required, regardless of whether BPS implementation would achieve a score of 29. Although the thresholds adopted by SJVAPCD were developed for internal use for projects in which the SJVAPCD is the lead agency, the thresholds provide guidance to other agencies establishing their own processes for determining significance related to climate change (San Joaquin Valley Air Pollution Control District 2009).

Alameda County

In February 2014, the Alameda County Board of Supervisors approved a *Community Climate Action Plan* (CCAP) for the unincorporated areas of Alameda County. The goal of the CCAP is to reduce Countywide GHG emissions by 15% by 2020. The CCAP includes measures to reduce GHG emissions from the following activities.

- Transportation (e.g., reduce vehicle trips and improve transit service).
- Land use (e.g., facilitate pedestrian and mixed-use development).
- Building energy (e.g., emphasize energy retrofits).
- Water (e.g., encourage water-efficient appliances and rainwater use).
- Waste (e.g., improve services for recycling and composting)
- Green infrastructure (e.g., expand urban forests).

An environmental review was completed under CEQA for the CCAP to identify any significant impacts on the environment, and, how those impacts may be mitigated. The Negative Declaration and Initial Study prepared by County planning staff indicates that the General Plan Amendment and adoption of the CCAP would have no significant environmental impacts in any category of environmental issue reviewed. The CCAP, General Plan Amendment, and Negative Declaration were adopted by the Board of Supervisors on February 4, 2014, and the CCAP is now in effect and part of the *Alameda County General Plan* (Alameda County 2014).

City of Tracy

The City of Tracy's *Sustainability Action Plan* provides Tracy with a guide to reduce GHG emissions, reduce consumption of nonrenewable resources, and improve public health. The goal of this plan is to reduce citywide GHG emissions by 15% per capita from the 2006 baseline, which includes targets for renewable energy. Applicable targets are described below (City of Tracy 2011).

- 25% of all community energy needs provided by renewable sources.
- 25% of all municipal energy needs provided by renewable sources.

City of Stockton

The City of Stockton's *Climate Action Plan* provides Stockton with numerous measures for both existing and new development. The goal of this plan is to reduce citywide GHG emissions by 20% per capita from 2005 to 2020. The largest GHG reductions are identified in the areas of building energy (both energy efficiency and renewable energy), transportation, and waste (City of Stockton 2014).

3.8.1.2 Environmental Setting

Global Climate Change

The process known as the *greenhouse effect* keeps the atmosphere near Earth's surface warm enough for the successful habitation of humans and other life forms. The greenhouse effect is created by sunlight that passes through the atmosphere. Some of the sunlight striking Earth is absorbed and converted to heat, which warms the surface. The surface emits a portion of this heat as infrared radiation, some of which is re-emitted toward the surface by GHGs. Human activities that generate GHGs increase the amount of infrared radiation absorbed by the atmosphere, thus enhancing the greenhouse effect and amplifying the warming of Earth.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution (Intergovernmental Panel on Climate Change 2018). Rising atmospheric concentrations of GHGs more than natural levels result in increasing global surface temperatures—a process commonly referred to as *global warming*. Higher global surface temperatures, in turn, result in changes to Earth's climate system, including increased ocean temperature and acidity, reduced sea ice, variable precipitation, and increased frequency and intensity of extreme weather events (Intergovernmental Panel on Climate Change 2018). Large-scale changes to Earth's system are collectively referred to as *climate change.*

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that human-induced warming reached approximately 1 degree Celsius (°C) above pre-industrial levels in 2017, increasing at 0.2°C per decade. Under the current nationally determined contributions of mitigation from each country until 2030, global warming is expected to rise to 3°C by 2100, with warming to continue afterward (Intergovernmental Panel on Climate Change 2018). Large increases in global temperatures could have substantial adverse effects on the natural and human environments worldwide and in California.

Principal Greenhouse Gases

The principal anthropogenic (i.e., human-made) GHGs contributing to global warming are CO_2, CH_4, N_2O, and fluorinated compounds, including SF_6, HFCs, and PFCs. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic sources. The primary GHGs of concern associated with the project are CO_2, CH_4, N_2O, and SF_6. Principal characteristics of these pollutants are discussed in the following sections. Note that HFCs and PFCs are not discussed because these gases are primarily generated by industrial and manufacturing processes, which are not anticipated as part of the project.

Methods have been set forth to describe GHGs emissions in terms of a single gas to simplify reporting and analysis. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in IPCC reference documents. The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e, which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition). Table 3.8-1 lists the GWP of CO_2, CH_4, N_2O, and SF_6.

Table 3.8-1. Global Warming Potentials of Key Greenhouse Gases for the Sacramento Campus

Greenhouse Gas	Global Warming Potential (GWP) (100 years)
CO_2	1
CH_4	25
N_2O	298
SF_6	22,800

Sources: California Air Resources Board 2020a.
CH_4 = methane; CO_2 = carbon dioxide; N_2O = nitrous oxide; SF_6 = sulfur hexafluoride.

All GWPs used for CARB's GHG reporting and to assess attainment of the state's 2020 and 2030 reduction targets are considered over a 100-year timeframe (as shown in Table 3.8-1). However, CARB recognizes the importance of SLCP and reducing these emissions to achieve the state's overall climate change goals. SLCP have atmospheric lifetimes on the order of a few days to a few decades, and their relative climate forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2 (California Air Resources Board 2017b). Recognizing their short-term lifespan and warming impact, SLCP are measured in terms of CO_2e using a 20-year period. The use of GWPs with a time horizon of 20 years or better captures the importance of SLCP and gives a better perspective on the speed at which emission controls will impact the atmosphere relative to CO_2 emission controls. The SLCP Reduction Strategy, which is discussed above, addresses CH_4, HFC, and anthropogenic black carbon. CH_4 has a lifetime of 12 years and a 20-year GWP of 72. HFC gases have lifetimes of 1.4 to 52 years and a 20-year GWP of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200 (California Air Resources Board 2017b).

Carbon Dioxide

CO_2 is the most important anthropogenic GHG and accounts for more than 80 percent of all GHG emissions emitted in California (California Air Resources Board 2020b). Its atmospheric lifetime ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated. CO_2 enters the atmosphere through fossil fuels (i.e., oil, natural gas, and coal) combustion, solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or *sequestered*) when it is absorbed by plants as part of the biological carbon cycle.

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 25 (California Air Resources Board 2020a). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal. Certain land uses also function as a both a source and sink for CH_4 (i.e., they remove CH_4 from the atmosphere). For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink.

Nitrous Oxide

Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion.

Sulfur Hexafluoride

SF_6, a human-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes. SF_6 is a powerful GHGs with a GWP of 22,800 (California Air Resources Board 2020a). Because SF_6 is a manmade chemical, it did not exist in the atmosphere before the twentieth century.

Emissions Inventories

A GHG inventory is a quantification of all GHG emissions and sinks[2] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a building or person). Table 3.8-2 outlines the most recent global, national, statewide, and local GHG inventories.

Table 3.8-2. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory	CO_2e (metric tons)
2010 Global GHG Emissions Inventory	52,000,000,000
2018 National GHG Emissions Inventory	6,677,800,000
2017 State GHG Emissions Inventory	424,100,000
2005 Alameda County	930,000
2005 City of Stockton	2,360,932
2006 City of Tracy	11,449

Sources: Intergovernmental Panel on Climate Change 2014; U.S. Environmental Protection Agency 2020; California Air Resources Board 2020c; Alameda County 2014; City of Tracy 2011; City of Stockton 2014.
CO_2e = carbon dioxide equivalent.

As shown in Table 3.8-2, California produces about 1 percent of the entire world's GHG emissions and 6 percent of the nation's GHG emissions, with major emitting sources including fossil fuel consumption from transportation (41 percent), industry (24 percent), electricity production (15 percent), agricultural and forestry (8 percent), residential (7 percent), and commercial (5 percent) (California Air Resources Board 2020c). As discussed above, the California government has put in place programs and legislation to reduce GHG emissions across all sectors of the economy.

Potential Climate Change Effects

Climate change is a complex process that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result in sea level rise (both globally and regionally) as well as changes in climate and rainfall, among other effects, there remains uncertainty about characterizing precise *local* climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent will take further research to

[2] A GHG sink is a process, activity, or mechanism that removes a GHG from the atmosphere.

define. Significant impacts from global climate change worldwide and in California include the following:

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor, due to the atmosphere's ability to hold more water vapor at higher temperatures (California Natural Resources Agency 2018).
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets (Intergovernmental Panel on Climate Change 2018).
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (Intergovernmental Panel on Climate Change 2018).
- Declining Sierra Nevada Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70% over the next 100 years (Governor's Office of Planning and Research et al. 2018).
- Increasing the number of days conducive to ozone formation (e.g., clear days with intense sun light) by 25% to 85% (depending on the future temperature scenario) by the end of the twenty-first century in high ozone areas, including Southern California (California Natural Resources Agency 2018).
- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level (California Natural Resources Agency 2018).
- Exacerbating the severity of drought conditions in California such that durations and intensities are amplified, ultimately increasing the risk of wildfires and consequential damage incurred (California Natural Resources Agency 2018).

3.8.2 Environmental Impacts

This section describes the environmental impacts of the project in the context of GHGs and climate change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The section also identifies mitigation measures to reduce the level of significant impacts.

3.8.2.1 Methods for Analysis

Project-level GHG emissions and associated impacts were assessed using the same methods as described in Section 3.3, *Air Quality*. The GHG analysis also considers emissions from minor electricity consumption and SF_6 circuit breaker leakage, as well as emission reductions that would occur from offsetting grid electricity, which includes fossil fuel-based resources, with wind generated electricity, which is a renewable resource that does not generate any emissions. Refer to Appendix B for additional modeling detail, including equipment and vehicle assumptions.

3.8.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors, which are primarily pollutants of regional and local concern). Given their long atmospheric lifetimes (see Table 3.8-1), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative. Consequently, the BAAQMD, SJVAPCD, and other jurisdictions and agencies consider climate change to be a cumulative issue. Specifically, the BAAQMD indicates in its CEQA Guidelines:

> If annual emissions of operational-related GHGs exceed these threshold levels, the proposed project would result in a cumulatively considerable contribution of GHG emissions and a cumulatively significant impact to global climate change. (Bay Area Air Quality Management District 2017)

Consequently, the evaluation of climate change impacts in this analysis represents a cumulative analysis.

Currently, BAAQMD and SJVAPCD do not identify a numeric threshold for assessing the significance of construction related GHG emissions. However, cumulative GHG emissions typically associated with construction may be orders of magnitude lower than the operational emissions from the project, simply because construction emissions are generally short term in duration compared to the project's overall lifetime (Governor's Office of Planning and Research 2018). BAAQMD and SJVAPCD have operational GHG thresholds, but they are not applicable to the project.

3.8.2.3 Impacts and Mitigation Measures

Impact GHG-1: Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (less than significant)

The PEIR concluded that while repowering the Altamont Pass Wind Resource Area (an aggregate of all the anticipated repowering projects proposed within the program area) would result in short-term emissions of GHGs, primarily associated with construction activities, and the potential operational emission of SF_6, the repowering projects collectively would result in an annual net reduction of more than 100,000 tons of CO_2e. This beneficial impact would be less than significant.

Table 3.8-3 summarizes estimated construction and operational GHG emissions associated with the project. Unlike most regional and local criteria pollutants, GHG emissions are inherently cumulative and do not ascribe to air district boundaries. Accordingly, GHG emissions generated in BAAQMD and SJVAPCD during construction are summed together in Table 3.8-3.

The net effect on operational emissions during the first year of operation is also presented. Electricity produced by the statewide grid is generated in part by fossil-fueled sources (e.g., natural gas facilities). Because additional renewable resources will be integrated into the statewide electrical grid as a result of the RPS, the annual displaced emissions achieved by the project will decline as a function of time (up to 100% renewable resources by 2045 pursuant to SB 100).

Table 3.8-3. GHG Emissions from Project Construction and Operation (metric tons)

Source	CO_2	CH_4	N_2O	SF_6	CO_2e
Construction					
Laydown, substations, and switch yards	102	<1	<1	0	104
Road construction	312	<1	<1	0	315
Turbine foundations	438	<1	<1	0	444
Turbine delivery and installation	213	<1	<1	0	216
Utility collector line installation	103	<1	<1	0	104
Restoration and cleanup	155	<1	<1	0	157
Offsite truck trips	835	<1	<1	0	874
Offsite worker trips	85	<1	<1	0	86
Electricity use	1	<1	<1	0	1
Total	**2,245**	**<1**	**<1**	**0**	**2,300**
Amortized (per year for 30 years)					77
Operation					
Offsite worker trips	148	<1	<1	<1	149
Maintenance/operation	63	<1	<1	<1	63
Circuit breaker leakage	0	0	0	<1	13
Total	**210**	**<1**	**<1**	**<1**	**225**
Total annual construction and operation emissions					301
Annual GHG reductions from offsetting grid electricity (Year 1)[a]					-26,308
Annual net GHG emissions (Year 1)[a]					-26,006

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; SF_6 = sulfur hexafluoride; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas.

[a] Reductions and emissions presented represent Year 1 of project operation. Annual displaced emissions achieved by the project will decline as a function of time as the statewide grid incorporates additional renewable sources over time.

As shown in Table 3.8-3, wind energy generated by the project would reduce GHG emissions by approximately 26,006 metric tons CO_2e during its first year of operation. This would more than offset emissions generated by project construction and operation. The project would continue to generate emissions reductions until 2045, which is when state law requires the statewide grid to be 100% renewable. This impact would be less than significant, and no mitigation is required.

Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (less than significant with mitigation)

The PEIR evaluated the repowering of the program area for consistency with the following measures relevant to GHG emissions.

- AB 32 Scoping Plan Measure T-7: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)—Discrete Early Action.

- AB 32 Scoping Plan Measure E-3: Renewables Portfolio Standard.
- AB 32 Scoping Plan Measure H-6: High Global Warming Potential Gas Reductions from Stationary Sources – SF_6 Leak Reduction and Recycling in Electrical Applications.
- Alameda County CCAP Measure E-10**:** Require new construction to use building materials containing recycled content.
- Alameda County CCAP Measure WS-2: Strengthen the Construction and Demolition Debris Management Ordinance.

In concept, the proposed project is being pursued to promote sustainability and further alternative energy. Although the measures included in the AB 32 Scoping Plan, 2017 Scoping Plan, and Alameda County CCAP are necessarily broad, the project is generally consistent with the goals and desired outcomes of the plans. The additional wind energy generated by the project would directly support the decarbonization of the electric power sector, helping California to meet the GHG goals contained in SB 32, SB 100, and EO B-55-18. Nevertheless, emissions generated by the project could potentially conflict with applicable measures in the AB 32 Scoping Plan, 2017 Scoping Plan, and Alameda County CCAP.

Except for Scoping Plan Measure E-3, the PEIR concluded that the repowering projects could potentially conflict with all measures. However, implementation of PEIR Mitigation Measure GHG-2a, *Implement best available control technology for heavy-duty vehicles*[3]; and PEIR Mitigation Measures GHG-2b, *Install low SF_6 leak rate circuit breakers and monitoring*; GHG-2c, *Require new construction to use building materials containing recycled content*; and GHG-2d, *Comply with construction and demolition debris management ordinance*, would reduce this potential impact to a less-than-significant level. More specifically, the implementation of best available control technology for heavy-duty vehicles would limit GHG emissions, while the installation of low leak rate circuit breakers and monitoring would increase operational efficiencies and reduce GHG emissions. The use of recycled building materials and compliance with the construction and demolition debris management ordinance would also reduce GHG emissions associated with material production and landfill waste, respectively.

PEIR Mitigation Measure GHG-2a: Implement best available control technology for heavy-duty vehicles

The applicant will require existing trucks/trailers to be retrofitted with the best available technology and/or CARB-approved technology consistent with the CARB Truck and Bus Regulation (California Air Resources Board 2019). The CARB Truck and Bus Regulation applies to all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds.

Starting January 1, 2015, the applicant must replace lighter trucks (GVWR of 14,001 to 26,000 pounds) with engines that are 20 years or older with newer trucks. The Applicant has the option to install a PM filter retrofit on a lighter truck by 2014 to make the truck exempt from replacement until January 1, 2020, and any lighter truck equipped with a PM filter retrofit prior to July 2011 would receive credit toward the compliance requirements for a heavier truck or bus in the same fleet.

[3] PEIR Mitigation Measure GHG-2a requires the project applicant to comply with CARB's Truck and Bus Regulation. Several of the initial compliance dates for the regulation have passed and are therefore not applicable to the project.

Starting January 1, 2012, the applicant is required to meet the engine model year schedule shown below for heavier trucks (GVWR greater than 26,000 pounds). To comply with the schedule, the applicant will install the best available PM filter on 1996 model year and newer engines and would replace the vehicle 8 years later. The Applicant will replace trucks with 1995 model year and older engines starting in 2015. Replacements with 2010 model year or newer engines meets the final requirements, but the applicant could also replace trucks with used trucks that would have a future compliance date on the schedule. For example, a replacement with a 2007 model year engine complies until 2023. By 2023 all trucks and buses must have 2010 model year engines with few exceptions.

Engine Model Year Schedule for Heavier Trucks	
Engine Model	Requirement from January 1
Pre-1994	No requirements until 2015, then 2010 engine
1994–1995	No requirements until 2016, then 2010 engine
1996–1999	PM filter from 2012 to 2020, then 2010 engine
2000–2004	PM filter from 2013 to 2021, then 2010 engine
2005–2006	PM filter from 2014 to 2022, then 2010 engine
2007–2009	No requirements until 2023, then 2010 engine
2010	Meets final requirements

In addition, the applicant could comply with a phase-in option that would allow the applicant to decide which vehicles to retrofit or replace, regardless of engine model year. The applicant must report information about all heavier trucks starting January 31, 2012, to use this option.

The Applicant could comply by demonstrating that trucks have met the percentage requirement each year as shown in the table below. For example, by 2012 the applicant's fleet would need to have PM filters on 30% of the heavier trucks in the fleet. This option counts 2007 model year and newer engines originally equipped with PM filters toward compliance and would reduce the overall number of retrofit PM filters needed. Any engine with a PM filter regardless of model year would be compliant until at least 2020. Beginning January 1, 2020, all heavier trucks would need to meet the requirements specified in the Compliance Schedule for Heavier Trucks.

Phase-In Option for Heavier Trucks	
Compliance Date	Vehicles with PM Filters
1-Jan-12	30%
1-Jan-13	60%
1-Jan-14	90%
1-Jan-15	90%
1-Jan-16	100%

PEIR Mitigation Measure GHG-2b: Install low SF6 leak rate circuit breakers and monitoring

The applicant will ensure that any new circuit breaker installed at a substation has a guaranteed SF_6 leak rate of 0.5% by volume or less. The applicant will provide Alameda County with documentation of compliance, such as specification sheets, prior to installation of the circuit breaker. In addition, the applicant will monitor the SF_6-containing circuit breakers at the substation consistent with Scoping Plan Measure H-6 for the detection and repair of leaks.

PEIR Mitigation Measure GHG-2c: Require new construction to use building materials containing recycled content

The applicant will require the construction of all new substation and other permanent buildings to incorporate materials for which the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10% of the total value of the materials in the project.

PEIR Mitigation Measure GHG-2d: Comply with construction and demolition debris management ordinance

The applicant will comply with the County's revised Green Building Ordinance regarding construction and demolition debris as follows: (1) 100% of inert waste and 50% wood/vegetative/scrap metal not including Alternative Daily Cover (ADC) and unsalvageable material will be put to other beneficial uses at landfills, and (2) 100% of inert materials (concrete and asphalt) will be recycled or put to beneficial reuse.

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3.9 Hazards and Hazardous Materials

This section describes the regulatory and environmental setting for hazards and hazardous materials. It also describes impacts from hazards and hazardous materials that would or could be expected to result from implementation of the project. Mitigation measures are prescribed where feasible and appropriate to reduce or avoid hazards and exposure to hazardous materials.

3.9.1 Existing Conditions

3.9.1.1 Regulatory Setting

Federal

Hazardous Materials and Waste Handling

The federal Resource Conservation and Recovery Act of 1976 (RCRA) established a “cradle-to-grave” regulatory program governing the generation, transportation, treatment, storage, and disposal of hazardous waste. Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA insofar as the state program is at least as stringent as federal RCRA requirements. In California, the Department of Toxic Substances Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous material waste. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; dictate the management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills. These regulations also require hazardous materials users to prepare written plans, such as a Hazardous Materials Business Plan, that describe hazardous materials inventory information, storage and secondary containment facilities, emergency response and evacuation procedures, and employee hazardous materials training programs. Several agencies participate in enforcing hazardous materials management requirements, including DTSC, the Regional Water Quality Control Boards, and the Alameda County Department of Environmental Health’s Hazardous Materials/Waste Program.

Transportation of Hazardous Materials and Oversized Loads

The U.S. Department of Transportation regulates hazardous materials transportation on all interstate roads. Within California, the state agencies with primary responsibility for enforcing federal and state regulations and for responding to transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). Together, federal and state agencies determine driver-training requirements, load-labeling procedures, and container specifications. Although special requirements apply to transporting hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.

Caltrans has the discretionary authority to issue special permits for the movement of vehicles/loads exceeding statutory limitations on the size, weight, and loading of vehicles contained in Division 15 of the California Vehicle Code. Requests for such special permits require the completion and application for a Transportation Permit.

Aviation Hazards

Federal Aviation Administration (FAA) Regulations (14 Code of Federal Regulations [CFR] 77) establish standards for what constitutes an obstruction to navigable airspace. Obstructions include any object if it is: (1) 500 feet above ground level; (2) 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of an airport; and (3) above a height within a terminal obstacle clearance area or en route obstacle clearance area. In addition, California Public Utilities Code section 21659 prohibits hazards near airports (as defined by 14 CFR 77) unless a permit allowing the construction is issued by the Caltrans Division of Aeronautics. FAA requires a developer to file a Notice of Proposed Construction (Form 7460) for any structure greater than 200 feet above ground level. The form requires a proposal for marking and lighting of wind turbines and towers. FAA determines if the project would create a hazard to navigable airspace and issues either a Determination of No Hazard or a Notice of Presumed Hazard.

State of California

California hazardous materials and wastes regulations are equal to or more stringent than federal regulations. The U.S. Environmental Protection Agency (EPA) has granted the state primary oversight responsibility to administer and enforce hazardous waste management programs. State regulations require planning and management to ensure that hazardous materials are handled, stored, and disposed of properly to reduce risks to human health and the environment. Several key state laws pertaining to hazardous materials and wastes are discussed below.

Worker Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal/OSHA) and the federal Occupational Safety and Health Administration are the agencies responsible for assuring worker safety in the workplace.

Cal/OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices within the state. At sites known to be contaminated, a site safety plan must be prepared to protect workers. The site safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

Fire Protection

The California Public Resources Code (Section 4101 et seq.) includes fire safety requirements for which the Department of Forestry and Fire Protection (CalFire) has adopted regulations (for example, Chapters 6 and 7 of Chapter 1.5 of Title 14 of the California Code of Regulations [CCR]) that apply to state responsibility areas (SRAs). As the name implies, SRAs are areas where CalFire has primary responsibility for fire protection. During the fire hazard season, these regulations: (a) restrict the use of equipment that may produce a spark, flame, or fire; (b) require the use of spark arrestors[1] on equipment that has an internal combustion engine; (c) specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and (d) specify fire-suppression equipment that must be provided onsite for various types of work in fire-prone areas.

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[1] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap commonly is used to retain carbon particles from the exhaust.

SRAs include much of the wildlands in unincorporated Alameda County. According to CalFire's hazards area mapping, the program area is located in a zone that has a moderate to high risk for wildland fire hazards within the SRA (California Department of Forestry and Fire Protection 2007).

Local

Alameda County General Plan

The Safety Element of the *Alameda County General Plan* (Alameda County 2014) contains goals, policies, and actions the County might take related to nonnatural hazards and fire hazards. Many of the principles and actions refer to new development. Those relating to the project as an existing facility are excerpted below.

Goal 2. To reduce the risk of urban and wildland fire hazards.

P3. Development should generally be discouraged in areas of high wildland fire hazard where vegetation management programs, including the creation and maintenance of fuel breaks to separate urban uses would result in unacceptable impacts on open space, scenic and ecological conditions.

Goal 4. Minimize residents' exposure to the harmful effects of hazardous materials and waste.

P1. Uses involving the manufacture, use or storage of highly flammable (or toxic) materials and highly water reactive materials should be located at an adequate distance from other uses and should be regulated to minimize the risk of on-site and off-site personal injury and property damage. The transport of highly flammable materials by rail, truck, or pipeline should be regulated and monitored to minimize risk to adjoining uses.

East County Area Plan

The Hazard Zones and Environmental Health and Safety Elements of the *East County Area Plan* contain goals, policies, and programs related to hazards (Alameda County 2000).

Hazard Zones

Goal: To minimize the risks to lives and property due to environmental hazards.

Policy 134: The County shall not approve new development in areas with potential natural hazards (flooding, geologic, wildland fire, or other environmental hazards) unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis.

Environmental Health and Safety

Program 117: The County shall work with the California Department of Forestry and Fire Protection to designate "very high fire hazard severity zones" in conformance with AB 337 (1992). The County shall ensure that all zones designated as such meet the standards and requirements contained in this legislation.

Program 118: The County shall prepare a comprehensive wildland fire prevention program including fuelbreaks, brush management, controlled burning, and access for fire suppression equipment.

Alameda County Department of Environmental Health

The Alameda County Department of Environmental Health (ACDEH) is the Certified Unified Program Agency (CUPA) for Alameda County. This certification by the California Secretary of Environmental

Protection authorizes the ACDEH to implement the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program specified in Health and Safety Code Chapter 6.11 of Division 20 (beginning with Section 25404). As the CUPA, ACDEH oversees the regulatory programs for Hazardous Materials Business Plans, underground and aboveground storage tanks, onsite treatment of hazardous waste, hazardous waste generators, and California Accidental Release Prevention.

San Joaquin County's Aviation System Airport Land Use Compatibility Plan

This San Joaquin County Airport Land Use Compatibility Plan (ALUCP) represents the updated ALUCP for San Joaquin County, coordinated through the San Joaquin Council of Governments, which serves as the Airport Land Use Commission (ALUC) for San Joaquin County. The San Joaquin ALUCP provides for the orderly growth of an air- port including the area surrounding the airport referred to as the respective air- port's "Area of Influence." Its primary function is to safeguard the general welfare of people residing within the vicinity of the airport and the public in general. Specifically, the plan seeks to protect the public from the adverse effects of airport noise, to ensure that people and facilities are not concentrated in areas susceptible to air- craft accidents, and to ensure that no structures or activities encroach upon or adversely affect the use of navigable air- space.

Policies applicable to the program are excerpted below (San Joaquin County Aviation System 2009).

3.0 Land Use Action Compatibility Criteria

3.1.1. *Safety and Compatibility Zones* – There are six safety zones defined for each airport which include:

(a) Zone 1, Runway Protection Zone…

(b) Zone 2, Inner Approach/Departure Zone…

(c) Zone 3, Inner Turning Zone…

(d) Zone 4, Outer Approach/Departure Zone…

(e) Zone 5, Sideline Safety Zone…

(f) Zone 6, Airport Property Zone…

(g) Zone 7, Traffic Pattern Zone. Zone 7 includes all other portions of regular aircraft traffic patterns and pattern entry routes. Outdoor stadiums and similar uses with very high intensities should be prohibited. In addition, hazards to flight (physical [e.g., tall objects], visual, and electronic forms of interference with the safety of aircraft operations) are also prohibited. Table 3A provides a complete list of prohibited uses and conditions for Zone 7.

(h) Zone 8, Airport Influence Area (AIA). Properties within the AIA are routinely subject to overflights by aircraft using public-use airports. Hazards to flight (physical [e.g., tall objects], visual, and electronic forms of interference with the safety of aircraft operations) are prohibited within the AIA. Table 3A provides a list of prohibited uses and conditions for the AI

3.4.3*. Height Restriction Criteria* – The height of objects within the influence area of each airport shall be reviewed, and restricted if necessary, according to the following criteria. The locations of these zones are depicted on the respective Compatibility Map for each airport.

(d) Within Zone 7 and AIA, generally, there is no concern with regard to any object up to 100 feet AGL tall unless it is located on high ground or it is a solitary object (e.g., an antenna) more than 35 feet AGL above the ground.

Best Management Practices

As discussed under Chapter 3.7, *Geology, Soils, Mineral Resources, and Paleontological Resources*, any future project that would disturb 1 or more acres of soil, or would disturb less than 1 acre but is part of a larger common plan of development must obtain coverage under General Permit Order 2010-0014-DWQ. Coverage under the General Permit requires development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must include plans for erosion and sediment control and would adhere to the County's grading ordinance and BMPs. Typical construction erosion control BMPs are listed below.

- Perform clearing and earth moving activities only during dry weather.
- Limit construction access routes and stabilize designated access points.
- Prohibit cleaning, fueling, and maintaining vehicles onsite, except in a designated area where washwater is contained and treated.
- Properly store, handle, and dispose of construction materials/wastes to prevent contact with stormwater.
- Train and provide instruction to all employees/subcontractors on construction BMPs.
- Control and prevent discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.

Alameda County Wind Farm Standard Conditions

As discussed in Chapter 2, *Program-Level Updated Information Description*, there is no ordinance dictating setback conditions in Alameda County. Setback requirements originally developed for Alameda County windfarms in the 1980s and 1990s were typically applied to wind projects using older generation turbines; however, these requirements were deemed inappropriate for the fourth-generation turbines proposed for repowering. Accordingly, the County updated the existing standards to be used for proposed repowering projects as presented in Table 2-8.

Professional Standards for Environmental Site Assessments

The American Society of Testing and Materials (ASTM) established ASTM E 1527-03 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Phase I ESA). The purpose of the ASTM standards is to identify, to the extent feasible, recognized environmental conditions in connection with a subject property. ASTM defines *recognized environmental condition* as the presence or likely presence of hazardous substances as defined by the federal Comprehensive Environmental Response, Compensation, and Liability Act, as well as conditions that indicate an existing release, a past release, or a material threat of a release of petroleum products into the ground, groundwater, or surface water.

According to ASTM, the Phase I ESA is a comprehensive assessment and is to be performed by an environmental professional. The duties of the environmental professional include three tasks: interviews and site reconnaissance, review and interpretation of information, and oversight of writing the report.

An environmental professional is defined as someone with at least one of the qualifications listed below.

- A current Professional Engineer's or Professional Geologist's license or registration from a state or U.S. territory with 3 years equivalent full-time experience.
- A Baccalaureate or higher degree from an accredited institution of higher education in a discipline of engineering or science and 5 years equivalent full-time experience.
- The equivalent of 10 years full-time experience.

3.9.1.2 Environmental Setting

The project site is located north and south of Patterson Pass Road between 1 and 2 miles north of Tesla Road, and approximately 1 mile south of Interstate 580. The conditions described in the PEIR also pertain to the project site, including the characteristics of wind turbines in the program area and fire hazards.

There are no public or private K–12 schools within 0.25 mile of the project site. The nearest school, Mountain House High School, is approximately 3.6 miles northeast of the nearest project border. The closest public airport to the project site is the Tracy Municipal Airport is approximately 5.7 miles east of the project site. Byron Airport is approximately 7 miles north of the project area and Livermore Municipal Airport is approximately 10.5 miles west of the project site. The nearest private airstrip is Meadowlark Field, located 4.3 miles west of the project site.

3.9.2 Environmental Impacts

This section describes the impact analysis relating to hazards and hazardous materials for the project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. If applicable, measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

3.9.2.1 Methods for Analysis

Identifying impacts relating to hazards and hazardous materials for the project involved a review of information from published maps, reports, Alameda County general plan documents, the County's updated setback requirements, the project-specific Phase I ESA (Appendix E), telephone interviews with fire protection agencies conducted as part of the PEIR, and other documents that describe the potential for hazards and hazardous materials occurrence in the APWRA.

3.9.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Creation of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Creation of 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.

- Emission of hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Placement of project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and resulting creation of a significant hazard to the public or the environment.
- Placement of project-related facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project size.
- Impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan.
- Exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

3.9.2.3 Impacts and Mitigation Measures

Impact HAZ-1: Creation of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (less than significant)

Construction of the project would involve small quantities of commonly used materials, such as fuels and oils, to operate construction equipment. However, because standard construction BMPs would be implemented to reduce pollutant emissions during construction, this impact is considered less than significant.

The majority of hazardous materials to be used during operations—fuels, oils, and lubricants—are of low toxicity. As these materials are required for operation of construction vehicles and equipment, BMPs would be implemented to reduce the potential for or exposure to accidental spills involving the use of hazardous materials. In addition, a Hazardous Materials Business Plan (HMBP) would be developed for the project. The HMBP would contain specific information regarding the types and quantities of hazardous materials, as well as their production, use, storage, spill response, transport, and disposal. Adherence to BMPs and HMBP designed to limit worker exposure to hazardous materials would be required and would reduce the potential for construction worker's exposure to hazards and hazardous materials.

Lubricants used in the turbine gearbox are potentially hazardous. The gearbox would be sealed to prevent lubricant leakage and would be periodically tested. When the lubricants have degraded to the point where they are no longer adequate, the gearbox would be drained, new lubricant added, and the used lubricants disposed of at an appropriate facility in accordance with all applicable laws and regulations.

Dielectric fluid to be used in transformers is biodegradable, contains no PCBs, and is not considered a hazardous material. Accordingly, the potential for hazardous materials to endanger the public or the environment is less than significant, and no mitigation is required.

Impact HAZ-2: Creation of 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 (less than significant)

Potential Release of Toxic Substances

Site workers, the public, and the environment could be inadvertently exposed to preexisting onsite contaminants during project construction. Small quantities of potentially toxic substances (such as petroleum and other chemicals used to operate and maintain construction equipment) would be used on the project site and transported to and from the area during construction. During operation, larger quantities[2] of fuel could be stored on the project site. In addition, fuel and other petroleum products could be stored onsite. Release of these hazardous materials into the environment would be a significant impact.

However, as previously discussed, an HMBP would be developed for the project. The HMBP would contain specific information regarding the types and quantities of hazardous materials, as well as production, use, storage, spill response, transport, and disposal of such materials. The handling and disposal of these materials would be governed according to regulations enforced by CUPA, Cal/OSHA, and DTSC, as previously discussed. In addition, regulations under the federal Clean Water Act require contractors to avoid allowing the release of materials into surface waters as part of their SWPPP and National Pollutant Discharge Elimination System permit requirements (see Section 3.10, *Hydrology and Water Quality*, for a discussion of the Clean Water Act and SWPPPs). This regulatory scheme would ensure that safety measures and precautions are taken, thereby reducing any potential impacts associated with the accidental upset or release of hazardous materials. This impact would be less than significant, and no mitigation is required.

Potential Blade Throw Hazard

There is no ordinance dictating setback conditions in Alameda County; rather, setbacks are determined on a project-by-project basis in accordance with the standard conditions of approval for a CUP. Setback requirements are described in Table 2-7 *Alameda County Turbine Setback Requirements* in Chapter 2, *Project Description.* These requirements have two setback options (standard minimum setback and reduced optional setback with conditions) for turbine siting relative to certain land uses. Table 3.9-1 shows the minimum setback distances for both setback options and the approximate distances between land uses and proposed turbines.

[2] Larger quantities are defined as more than 55 gallons of liquid, 500 pounds of solids, or 200 cubic feet of compressed gases

Table 3.9-1. Distances between Proposed Turbines and Land Uses

	Standard Minimum Setback	Reduced Optional Setback with Conditions	Distance from Closest Proposed Turbine
Residence	3 times TTH (456 m)	1.5 times TTH (228 m)	~ 900 m
Recreation Area – Carnegie State Vehicular Recreation	1.25 times TTH (190 m)	1.0 times TTH (152 m)	~2,200 m
Public Road – Patterson Pass Road	2.5 times TTH (380 m)	1.25 times TTH (190 m)	~390 m

TTH = total turbine height: the height to the top of the rotor at 12:00 position. Setback distance to be measured horizontally from center of tower at ground level without adjustment for slope; ft = feet; CUP = Conditional Use Permit. TTH for the project would not exceed approximately 152 meters or 500 feet.
m = meters

Persons, structures, and facilities within the blade throw hazard zone could be at risk of damage, injury, or death if struck by a falling blade. People potentially within the hazard zone include motorists travelling along Patterson Pass Road and county roads and those occupying residences. The important infrastructure in and adjacent to the project site potentially susceptible to damage from blade throw includes PG&E transmission lines and windfarm substations. Overall, the strict control of public access would reduce the risk of potential blade strike in the project site.

Turbines considered under the project would have a maximum total turbine height (TTH) of 152 meters. The project site consists largely of cattle-grazed land supporting off-site operating wind turbines and ancillary facilities. There is one residence within the project site (Mulqueeney Ranch), located south of the PG&E Tesla substation, approximately 865 feet from the proposed construction staging/laydown area. This residence is also located approximately 940 meters (3,110 feet) from the closest proposed turbine (turbine 9). This distance exceeds the standard minimum setback. Outside the project site, there are a few scattered residences along Midway Road and Patterson Pass Road, all of which are located more than 2,000 feet from the project site boundary.

The closest recreational area (Carnegie State Vehicular Recreation) to a proposed turbine is approximately 2,200 meters in distance. This distance is considered an adequate setback distance under both setback options and potential blade throw impacts would be less than significant.

For public roads, the minimum distance to ensure safety from blade throw hazard would be approximately 190 meters. The closest proposed turbine is approximately 390 meters from Patterson Pass Road. This distance exceeds the standard minimum setback, therefore project impacts related to hazards from blade failure would be less than significant, and no mitigation is required.

Impact HAZ-3: Emission of hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school (no impact)

There are no public or private K–12 schools within 0.25 mile of the project site. The nearest school is approximately 3.6 miles east of proposed wind facilities. Thus, hazardous materials would not be emitted or released within 0.25 mile of any schools as a result of the project. In addition, implementation of the SWPPP by contractors would reduce the potential of a hazardous spill incident. There would be no impact. No mitigation is required.

Impact HAZ-4: Placement of project-related facilities on a site that is included on a list of hazardous materials sites, and resulting creation of a significant hazard to the public or the environment (less than significant with mitigation)

The project would involve soil disturbance. As outlined in the PEIR, a Phase I ESA (and remediation, if necessary) is required for all projects requiring a Conditional Use Permit (CUP) prior to construction activities as a standard condition of approval for the CUP. Accordingly, a Phase I ESA was prepared for the project by Jacobson James & Associates, Inc. on August 25, 2020 consistent with the requirements outlined in the APWRA Mitigation Measure HAZ-4, and as outlined in Section 1.2 and 1.3 of the Phase I ESA. In order to consider the historical operations and potential environmental concerns at and surrounding the project site the Phase I ESA considered the following in its report preparation:

- A property reconnaissance visit July 30, 2020;
- Interviews with property owners and representatives for the project site,
- Reviews of two previous Phase I ESAs conducted for the site (2005 and 2006);
- An Environmental Data Resources, Inc. (EDR) record review that included: historical aerial photographs; topographic maps; Sanborn maps; area/corridor reports and well search reports.[3]
- File reviews, including a review of the online public records portal of the Alameda County Clerk-Recorder's Office; review of the State Water Resources Control Board's (SWRCB) GeoTracker website on August 4, 2020; a review of the Department of Toxic Substances Control (DTSC) Envirostor website on August 4, 2020; and a review of the California Department of Well Resources (DWR) - Well Completion Report Map Application on August 18, 2020;

[3] The area/corridor report and well search report summarize the information and listings of several federal, state and local environmental databases including (but not limited to): Federal National Priorities List (NPL); Federal Delisted NPL; Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list; Federal CERCLIS No Further Remedial Action Planned list; Federal Resource Conservation and Recovery Act (RCRA) Corrective Action Report (CORRACTS) facilities list; Federal RCRA non-CORRACTS Hazardous Waste Treatment, Storage, and Disposal facilities list; Federal RCRA generators list; Federal institutional controls/engineering controls registries; Federal Emergency Response Notification System list; State and tribal equivalent NPL and CERCLIS lists; State and tribal landfill and/or solid waste disposal site lists; State and tribal leaking storage tank lists; State and tribal registered storage tank lists; State and tribal institutional control/engineering control registries; State and tribal voluntary cleanup sites; and State and tribal Brownfield sites.

Based on their data collection the Phase I ESA identified the following recognized environmental conditions (RECs),[4] controlled recognized environmental conditions (CREC),[5] historical recognized environmental conditions (HREC's),[6] and de minimis conditions at the project site.[7]

Table 3.9-2. Recognized Environmental Conditions

Type of environmental conditions identified	Description and location
REC	A Union Pacific Railroad railway transects the project site in the northern portion of the site; A burn pit is located adjacent to the access road, and north of the barn, on APN # 99B-7925-2-4 and remnants of wood and metal were observed within the burn pit; Multiple chemical storage containers (i.e., tanks, drums) were observed near the main residence on APN# 99B-7925-2-1, though no identifying markers were present on the containers, and no secondary containment was observed under the containers; Residual staining was observed in the immediate vicinity of the hazardous material storage tanks and treated poles located south of the main residence (approximately 500 feet south of the railroad) on APN# 99B-7925-2-4; Historical wind turbine pads, associated access roads, and associated underground buried electrical wiring is present throughout the project site; and, Electrical transmission lines and towers are located along multiple transects of the project site.
CREC	Site 300, located southeast of the project site is a documented DTSC cleanup site; assessment, cleanup, and remediation activities are ongoing at the site.
HREC	A reported release of oil occurred on APN# 99B-7890-2-6 during historical operations of a wind generation farm by USA Windpower circa 1990. The cleanup case was closed by the Alameda County Department of Environmental Health [ACDEH, (local oversight program)] in July 1994.

[4] A recognized environmental condition (REC) are those conditions where the presence or likely presence of any hazardous substances or petroleum products in, on, or at a site: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a materials threat of a future release to the environment.

[5] A controlled recognized environmental condition is a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

[6] A historical recognized environmental condition (HREC's) are those conditions where a past release of any hazardous substances or petroleum products that has occurred in connection with the Property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by the regulatory authority, without subjecting the property to any required controls.

[7] A de minimis condition are those conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

Type of environmental conditions identified	Description and location
De Minimis Conditions	PG&E Tesla Substation is located immediately adjacent to APN# 99B-7890-2-6; however, the site is regulated by various agencies, and no environmental impacts were discovered in the assessment; Distribution lines and associated transformers (pole mounted) are present at both residences and the barn; no staining was observed on the ground surface below the transformers. Septic systems (e.g., tank and leach field) associated with the main residence, trailer residence, and barn restroom; and, Gray water discharged at trailer residence.

The Phase I ESA concluded that while the identified conditions could potentially represent environmental hazards at the project site, a Phase II investigation would not be warranted. Overall, the identified environmental conditions are classified as either typical conditions that would be addressed through standard construction BMPs and compliance with regulations~~. Therefore~~ , or as potential soil contamination for which application of PEIR Mitigation Measure-HAZ-4 would ensure proper notification, handling and disposal. Therefore, with application of PEIR Mitigation Measure HAZ-4, construction BMPs, and compliance with regulations, construction and operation of the project would result in a less-than-significant impact related to the creation of a significant hazard to the public or the environment.

PEIR Mitigation Measure HAZ-4: Perform a Phase I Environmental Site Assessment prior to construction activities and remediate if necessary (only including the portion of the mitigation measure relevant to the proposed project)

If contamination is uncovered as part of Phase I or II environmental site assessments, remediation will be required. If materials such as asbestos‐containing materials, lead‐based paint, or PCB‐containing equipment are identified, these materials will be properly managed and disposed of prior to or during the demolition process.

Any contaminated soil identified on a project site must be properly disposed of in accordance with DTSC regulations in effect at the time. Hazardous wastes generated by the proposed project will be managed in accordance with the California Hazardous Waste Control Law (HSC, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulation (Title 22, CCR, Division 4.5).

If, during construction/demolition of structures, soil or groundwater contamination is suspected, the construction/demolition activities will cease and appropriate health and safety procedures will be implemented, including the use of appropriate personal protective equipment (e.g., respiratory protection, protective clothing, helmets, goggles).

Impact HAZ-5: Placement of project-related facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area (less than significant)

The project site is not within 2 miles of a public airport. The closest public airport to the project site is the Tracy Municipal Airport is approximately 6.2 miles east of the project site. The PEIR considered potential impacts related to private airstrips (see PEIR Impacts HAZ-6); the project site is also not located within 2 miles of a private airstrip. The nearest private airstrip is the Meadowlark Airstrip located approximately 4.3 miles southeast of the project site. Therefore, implementation of the project would not normally result in a safety hazard for people residing or working in the project site. However, according to the PEIR, projects with facilities in the influence area zones of local airports are required to submit a Notice of Proposed Construction or Alteration form to the FAA for review and to implement all FAA requirements to reduce potential aviation impacts.

A review of the Tracy Municipal Airport compatibility zones indicates that the project site is outside all compatibility and influence area zones (San Joaquin County Aviation System 2009). Also, wind turbines would require FAA lighting as most would be more than 200 feet tall and must be individually lit with obstruction lighting. Through its Notice of Proposed Construction or Alteration (Form 7460.1), the FAA would review the project prior to construction (14 CFR Part 77). The FAA analysis would include a review of proposed marking (paint scheme) and nighttime lighting to ensure that aircraft could readily identify and avoid the wind turbines. Compliance with FAA requirements would reduce the project's potential aviation safety impacts to an acceptable level of risk and therefore to a less-than-significant level.

Impact HAZ-6: Impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan (less than significant with mitigation)

During construction, there would be an increase in vehicular traffic transporting work crews, equipment, and materials. Construction traffic routing would be established in a Construction Traffic Control Plan as described in Section 3.16, *Transportation,* and would include a traffic safety and signing plan prepared by the project engineers in coordination with Alameda County and other related agencies. The plan would define hours, routes, and safety and management requirements. The project would therefore not conflict with any adopted emergency response plan or emergency evacuation plan. Implementation of PEIR Mitigation Measure TRA-1 would reduce potential impacts to a less-than-significant level by ensuring traffic is routed to reduce potential impacts.

Vehicular traffic associated with project operation and maintenance (O&M) would be limited to six to eight O&M staff (turbine technicians, operations personnel, administrative personnel, and management staff). O&M staff would monitor turbine and system operation, perform routine maintenance, shut down and restart turbines when necessary, and provide security. Accordingly, operation of the project would have minimal vehicular traffic and generate a less than significant impact on an adopted emergency response plan or emergency evacuation plan.

PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan

Impact HAZ-7: Exposure of people or structures, either directly or indirectly, to a significant risk involving wildland fires (less than significant)

The potential of the project to exacerbate wildfire risks is addressed under Section 3.19, *Wildfire.* As addressed in this section, the project is in a moderate to high fire hazard severity zone. The project site consists primarily of grassland and grazing land. Dry climate conditions create circumstances rich with fuels, although active grazing, agricultural irrigation, and landscape irrigation provide some fuel reduction. Human activities are the primary reason wildfires start, although lightning strikes do occasionally occur. As discussed in Section 3.19 *Wildfire*, the most likely source of an ignition from the project would be hardware or conductor failures of power collection lines, dropping of collection lines, turbine malfunction or mechanical failure, and avian-related incidents. In addition, during construction, additional work crews would be required, temporarily increasing the number of vehicles in the project site. Climate conditions together with the potential for vehicle-related ignitions increase the potential for ignition, especially during the summer months.

Construction on project site would be a temporary activity, and onsite water tanks would be made available for fire suppression needs during construction. OSHA requirements would be followed regarding the safe control and storage of combustible materials. Therefore, construction of the project would not result in significant impacts to exposure of people or structures directly or indirectly of wildland fires.

The project would install 36 new wind turbines on the project site, an area identified as a moderate to high fire hazard severity zone. Thereby potentially increasing the risk of wildfires ignited by wind generators. However, the site is currently served by CalFire and the Alameda County Fire Department and wind turbines were formerly located on the site, thus the fire protection facilities and infrastructure required to protect the existing facilities are in place. In addition, as discussed in Chapter 2, *Project Description*, the project would install fourth-generation turbines, which have improved upon older models in terms of fire ignition risk and are anticipated to result in a reduction of potential fire ignitions. Under Operational Safety and Environmental Compliance Programs, the proposed turbines would be equipped with internal protective control mechanisms which would safely shut them down during a high-voltage grid outage or fire-related turbine failure. Collector substations would also be fenced and locked and would include visible safety signage. In addition, the project would be subject to County requirements for fire prevention as outlined in the County's *Altamont Pass Wind Farm Fire Requirements*. The project would be required to maintain firebreaks and clearances around electrical lines, as well as year-round water supplies to be provided for firefighting. Therefore, operation of the project would not result in significant impacts to exposure of people or structures directly or indirectly of wildland fires.

The PEIR concluded that the fire-related impact of individual repowering projects would be less than significant, and no mitigation is required. The project would also comply with the Altamont Pass Wind Farms Fire Requirements as described in Exhibit C of the 2005 CUPs. Therefore, the potential for exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires is less than significant, and no mitigation is required.

3.9.3 References Cited

Alameda County. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.

Alameda County Community Development Agency. 2014. *Alameda County General Plan, Safety Element*. Adopted January 8, 2013 Amended February 4, 2014

California Department of Forestry and Fire Protection. 2007. *Fire Hazard Severity Zones Maps, State Responsibility Areas*. Adopted November. Available: https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed on July 20, 2020.

San Joaquin County Aviation System. 2009. *Airport Land Use Compatibility Plan.* Adopted July. Amended January 2018 Prepared by Coffman Associates, Inc.

3.10 Hydrology and Water Quality

This section describes the environmental and regulatory setting for hydrology and water quality. It also describes impacts on hydrology and water quality that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

3.10.1 Existing Conditions

3.10.1.1 Regulatory Setting

Clean Water Act

The following are potentially applicable sections of the Clean Water Act (CWA) (33 United States Code 1251–13176).

Section 303 and 305—Total Maximum Daily Load Program

The State of California adopts water quality standards to protect beneficial uses of state waters as required by CWA 303 Total Maximum Daily Load Program and the State's Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act). CWA 303(d) established the total maximum daily load (TMDL) process to guide the application of state water quality standards (see the discussion of state water quality standards below). To identify candidate water bodies for TMDL analysis, a list of water-quality–limited streams is generated. Such streams are considered to be impaired by the presence of pollutants, including sediments, and to have no additional capacity for these pollutants.

In addition to the impaired water body list required by CWA Section 303(d), CWA Section 305(b) requires states to develop a report that assesses statewide surface water quality. Both CWA requirements are addressed through the development of a 303(d)/305(b) Integrated Report, which provides both an update to the 303(d) list and a 305(b) assessment of statewide water quality. The State Water Resources Control Board's (State Water Board's) statewide 2014/2016 California Integrated Report was based on Integrated Reports from each of the nine Regional Water Quality Control Boards (Regional Water Boards). After approval of the Section 303(d) list portion of the California Integrated Report by the State Water Board, the complete 2014 and 2016 California Integrated Report was approved by the U.S. Environmental Protection Agency (EPA) on April 6, 2018.

Section 401—Water Quality Certification

CWA Section 401 requires that an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant obtain a water quality certification (or waiver). Water quality certifications are issued by the Regional Water Boards in California. The San Francisco Bay Regional Water Board is responsible for the Bay Area and the Central Valley Water Board is responsible for the Central Valley. Because the project site is located in both the San Joaquin and San Francisco major watersheds and drains to the Central Valley and to San Francisco Bay, it is under the jurisdiction of both the Central Valley Water Board and the San Francisco Bay Regional Water Board (ESRI 2020). Under the CWA, the state (as implemented by the relevant Regional Water Board) must issue or waive CWA Section 401 water quality certification for a project to be permitted under CWA Section 404. Water quality certification requires the evaluation of water quality considerations associated with dredging or the placement of fill materials into waters of the United States. Construction of the proposed project would require CWA 401 certification for the project if CWA Section 404 requirements are triggered.

Section 402—National Pollutant Discharge Elimination System Program

The 1972 amendments to the federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources (CWA Section 402). The 1987 amendments to the CWA created a new section of CWA devoted to stormwater permitting (CWA 402[p]). EPA has granted the State of California primacy in administering and enforcing the provisions of CWA and the NPDES permit program. The NPDES permit program is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States.

The State Water Board issues both general and individual permits for certain activities. Although implemented at the state and local level, relevant general and individual NPDES permits are discussed below.

Construction Activities

Dischargers whose projects disturb 1 or more acres of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres are required to file a notice of intent to obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit). Construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation, but do not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP), which must be completed before construction begins. The SWPPP should contain a site map that shows the construction site perimeter; existing and proposed buildings, lots, roadways, and stormwater collection and discharge points; general topography both before and after construction; and drainage patterns across the project site. The SWPPP must list best management practices (BMPs) the discharger will use to manage stormwater runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a monitoring program for pollutants that are not visible to be implemented if there is a failure of BMPs; and a pH and turbidity monitoring program if the site discharges to a water body listed on the 303(d) list for sediment. The Construction General Permit describes the elements that must be contained in a SWPPP.

Post-Construction Stormwater Management

The individual NPDES permit requires that permanent water quality control devices treat all stormwater to the maximum extent practicable and result in no additional runoff. Runoff from new impervious surfaces of 10,000 square feet or more must be sized according to the volume or rate criteria identified in the permit. After treatment devices are installed, owners must enter into a maintenance agreement with the County to ensure the treatment devices are maintained, inspected, and reported on annually. Low impact development (LID) facilities are required for a project unless the project is eligible for LID reduction credit. LID includes rainwater harvesting, infiltration, and bio treatment.

Section 404—Permits for Fill Placement in Waters and Wetlands

CWA Section 404 regulates the discharge of dredged and fill materials into *waters of the United States*, which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from the U.S. Army Corps of Engineers (USACE) for all discharges of dredged or fill material into waters of the United States before proceeding with a proposed activity. Before any actions that may affect surface waters are implemented, a delineation of jurisdictional waters of the United States must be completed, following USACE protocols, to determine whether the study area contains wetlands or other waters of the United States that qualify for CWA protection. These areas include the following.

- Sections within the ordinary high water mark of a stream, including non-perennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

Section 404 permits may be issued for only the least environmentally damaging practical alternative (i.e., authorization of a proposed discharge is prohibited if there is a practical alternative that would have fewer significant effects and lacks other significant consequences). Section 404 might apply if construction were proposed within waters of the United States.

State

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) established the State Water Board and divided the state into nine regional basins, each with a Regional Water Board. The State Water Board is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, while the regional boards are responsible for developing and enforcing water quality objectives and implementation plans.

The Porter-Cologne Act authorizes the State Water Board to enact state policies regarding water quality in accordance with CWA 303. In addition, the act authorizes the State Water Board to issue waste discharge requirements (WDRs) for projects that would discharge to state waters. The Porter-Cologne Act requires that the State Water Board or the Regional Water Board adopt water quality control plans (basin plans) for the protection of water quality. A basin plan must perform the following functions.

- Identify beneficial uses of water to be protected.
- Establish water quality objectives for the reasonable protection of the beneficial uses.
- Establish a program of implementation for achieving the water quality objectives.

Basin plans also provide the technical basis for determining WDRs, taking enforcement actions, and evaluating clean water grant proposals. Basin plans are updated and reviewed every 3 years in accordance with Article 3 of Porter-Cologne Act and CWA 303(c) (Central Valley Regional Water Quality Control Board 2018).

California Regional Water Quality Control Board and Central Valley Water Board Basin Plan

Water quality in streams and aquifers of the region is guided and regulated by the respective Regional Water Board basin plans. State policy for water quality control is directed at achieving the highest water quality consistent with the maximum benefit to the people of the state. The project is under the jurisdiction of the Central Valley Water Board, which established regulatory standards and objectives for water quality in its Water Quality Control Plan for the Sacramento and San Joaquin River Basins, commonly referred to as the Basin Plan. To develop water quality standards consistent with the uses of a water body, the Regional Water Boards classify existing and potential beneficial uses for the Central Valley waters as part of their basin plan.

In general, beneficial uses can be classified to include municipal supply, cold freshwater habitat, groundwater recharge, fish migration, water contact recreation, noncontact water recreation, fish spawning, warm freshwater habitat, rare species habitat, and wildlife habitat (Central Valley Regional Water Quality Control Board 2018).

Local

Alameda County Stormwater Management Plan

The Department of Environmental Health developed a formal agreement with Public Works Agency to implement the industrial and commercial component of the Alameda Countywide Clean Water Program's Stormwater Management Plan for unincorporated Alameda County. The program includes inspection of facilities for compliance with the clean water regulations, outreach and education of best management practices to business owners, inspections for enforcement action, and creation and maintenance of a database of businesses in Alameda County unincorporated area for the Clean Water Program. This program also addresses items addressed above under *Construction Activities* in the *Federal* subsection.

East County Area Plan

Relevant components of the *East County Area Plan* to meet water quality goals for surface and groundwater are listed below (Alameda County 2000). These policies and implementation programs address similar components as in the *Alameda County General Plan*.

Policies

Policy 306: The County shall protect surface and groundwater resources by:

- preserving areas with prime percolation capabilities and minimizing placement of potential sources of pollution in such areas;
- minimizing sedimentation and erosion through control of grading, quarrying, cutting of trees, removal of vegetation, placement of roads and bridges, use of off-road vehicles, and animal-related disturbance of the soil;
- not allowing the development of septic systems, automobile dismantlers, waste disposal
- facilities, industries utilizing toxic chemicals, and other potentially polluting substances in creekside, reservoir, or high groundwater table areas when polluting substances could come in contact with flood waters, permanently or seasonally high groundwaters, flowing stream or creek waters, or reservoir waters; and,
- avoiding establishment of excessive concentrations of septic systems over large land areas.

Implementation Programs

Program 108: The County shall implement all federal, state and locally imposed statutes, regulations, and orders that apply to storm water quality. Examples of these include, but are not limited to:

- National Pollutant Discharge Elimination System (NPDES) stormwater permit issued by the California Regional Water Quality Control Board (RWQCB) to the Alameda County Urban Runoff Clean Water Program and amendments thereto;
- State of California NPDES General Permit for Storm Water Discharges (General Industrial Permit, General Construction Permit) and amendments thereto;
- Coastal Zone Management Act;
- Coastal Zone Act Reauthorization Amendments;
- Water Quality Control Plan, San Francisco Bay Basin Region (Basin Plan) and amendments thereto; and
- Letters issued by the RWQCB under the California Porter-Cologne Water Quality Act.

Program 109: The County shall endeavor to minimize herbicide use by public agencies by reviewing existing use and applying integrated pest management principles, such as mowing and mulching, in addition to eliminating or scaling back the need for vegetation control in the design phase of a project.

Program 110: The County shall conform with Alameda County Flood Control and Water Conservation District's (Zone 7) Wastewater Management Plan and the Regional Water Quality Control Board's San Francisco Bay Basin Plan.

3.10.1.2 Environmental Setting

Surface Water and Drainage

The project site is southwest of the San Joaquin–Sacramento Delta (Delta) in unincorporated northeastern Alameda County. The project site is located in the San Joaquin Delta Watershed hydrologic unit (hydrologic unit code [HUC] 18040003) (USEPA 2020). Figure 3.10-1 shows the drainages in and around the project site. The majority of the project site—comprising (from north to south) the Mountain House Creek, Lower Old River, and Lower Corral Hollow Creek watersheds—flows generally east toward the Central Valley.

Patterson Creek runs diagonally through the project site within proximity to Patterson Pass Road and drains to Lower Old River which drains to the Delta (ArcGIS Maps 2020). Bethany Reservoir is located north of the project site. The California Aqueduct and the Delta-Mendota Canal are located northeast of the project site.

Mountain House Creek (from Altamont Pass to Old River, Alameda and San Joaquin Counties; partly in Delta Waterways, southern portion) is listed as impaired for chloride and salinity under CWA Section 303(d). Old River (San Joaquin River to Delta-Mendota Canal; in Delta Waterways, southern portion) is impaired for chlorpyrifos, electrical conductivity, total dissolved solids (TDS), and low dissolved oxygen, under CWA Section 303(d) (State Water Resources Control Board 2017).

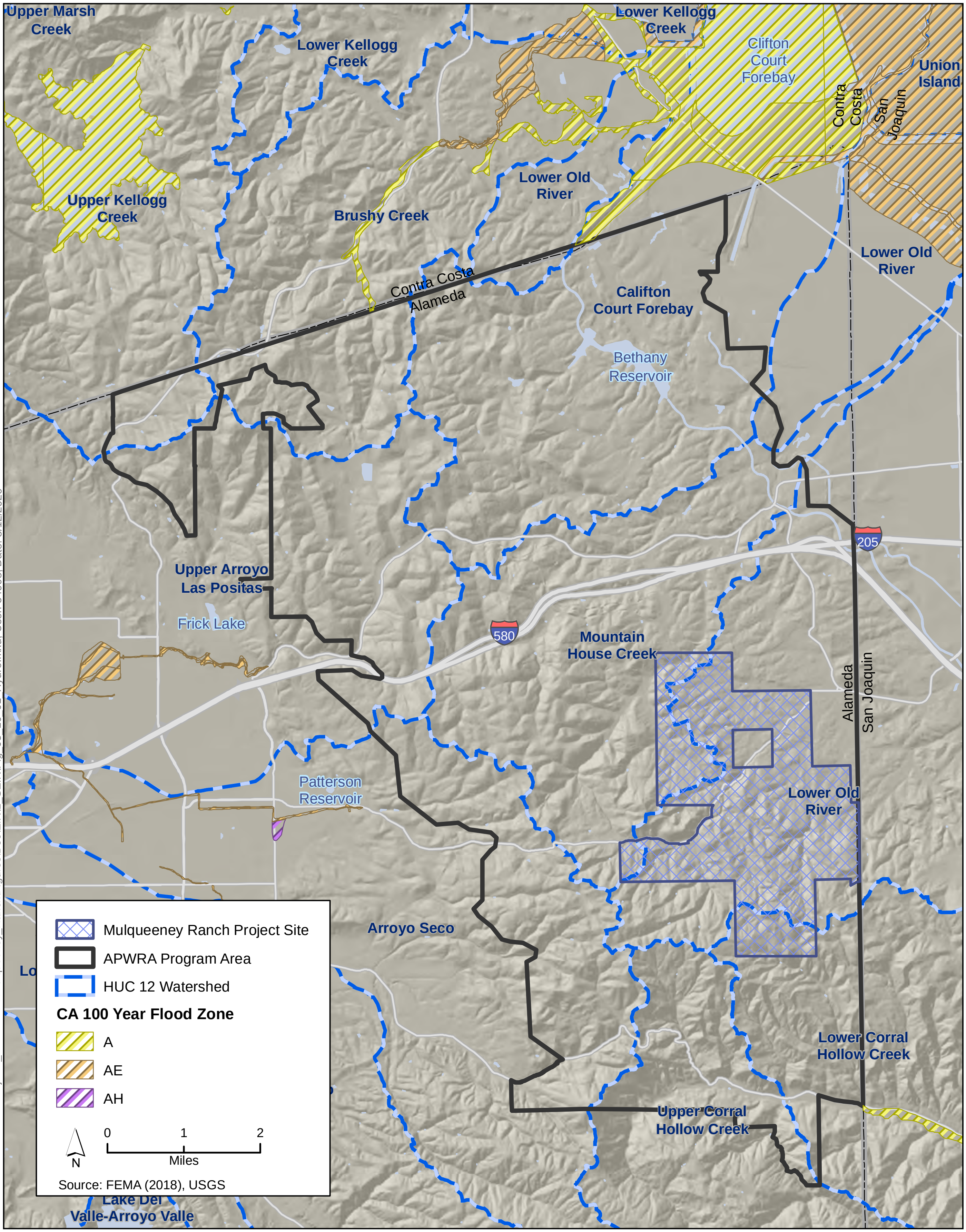

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Figure 3.10-1
Watersheds and Floodplains in the Project Area

Groundwater Resources

The project site is in the Tracy Subbasin (Basin Number 5-22.15) in the San Joaquin River Hydrologic Region. There are no published groundwater storage amounts for the entire basin; . Review of hydrographs for the Tracy Subbasin indicates that, except for some seasonal variation resulting from recharge and pumping, the majority of water levels in wells remained relatively stable over at least 10 years (Groundwater Exchange 2018).

Groundwater quality in the subbasin is characterized by a sodium water type and the southern part of the subbasin is characterized by calcium-sodium water type. The northern part of the subbasin is also characterized by a wide range of anionic water types including: bicarbonate; chloride; and mixed bicarbonate-chloride types. TDS concentrations in well water samples range from 50 to 3,520 milligrams per liter (mg/L), with an average of 463 mg/L. Areas of poor water quality exist throughout the subbasin. Elevated levels of chloride occur in several areas along the western side of the subbasin along with areas of elevated boron concentrations (Central Valley Regional Water Quality Control Board 2006).

In 2018 the subbasin basin prioritization was determined as medium with some concern over potential declining groundwater level and salt intrusion. Review of hydrographs from wells in the area, with the exception of seasonal variations resulting from recharge and pumping, found that groundwater levels were mostly stable. A water assessment done for the Antioch Municipal Reservoir and the San Joaquin River found that the San Joaquin River was vulnerable to effects of saltwater intrusion, chemical/petroleum processing or storage, and regulated point discharges.

Historically, as freshwater flow to the Delta decreased due to major diversion, saline bay waters have moved further upstream, replacing the fresh water. When chloride levels in the river exceed 250 milligrams per liter, the pumping ceases until chloride levels decrease. The Emergency Drought Barrier was constructed in West False River in 2015 to protect the interior of the Sacramento-San Joaquin Delta from saltwater intrusion during prolonged and exceptional drought conditions (Groundwater Exchange 2018).

Flooding

The project site is outside of the Federal Emergency Management Agency (FEMA) 100-year floodplain (see Figure 3.10-1), as identified on a Flood Insurance Rate Map.

3.10.2 Environmental Impacts

This section describes the impact analysis related to hydrology and water quality for the project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany the discussion of each identified significant impact.

3.10.2.1 Methods for Analysis

All project elements were analyzed by comparing baseline conditions, as described in Section 3.10.1, Existing Conditions, to conditions during construction and operation of the project. The analysis focuses on issues related to surface hydrology, groundwater supply, surface water and groundwater quality, and flood hazards. The key construction-related impacts were identified and evaluated qualitatively, based on the physical characteristics of the project site and the magnitude, intensity, location, and duration of activities.

The evaluation of surface water hydrology impacts considers potential changes in the physical characteristics of waterbodies, impervious surfaces, and drainage patterns throughout the project site as a result of project implementation. Impacts on groundwater supply and recharge are analyzed by comparing existing groundwater use and recharge capabilities with project conditions. Recharge is determined by the ability of water to infiltrate into the soil. Impacts on surface water and groundwater quality are analyzed by comparing existing water quality conditions with potential water quality conditions during project implementation. Potential project-related sources of water contaminants generated by industrial and project operational activities, such as vehicle use, operation and maintenance, trash generation, and the storage or inadvertent release of hazardous materials during project construction, are considered. The potential for water quality objectives to be exceeded and beneficial uses to be compromised is also considered. The impact analysis for flood risk uses FEMA mapping to determine the existing flood zone.

3.10.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Violation of any water quality standards or waste discharge requirements or other substantial degradation of surface water or groundwater quality.
- Substantial decrease of groundwater supplies or substantial interference with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.
- Substantial alteration of 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 that would result in any of the following:
    - Substantial erosion or siltation onsite or offsite.
    - Substantial increase in the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite.
    - Creation of or contribution to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
    - Impeding or redirecting flood flows.
- In flood hazard, tsunami, or seiche zones, risk of release of pollutants as a result of project inundation.
- Conflict with or obstruction of implementation of a water quality control plan or sustainable groundwater management plan.

3.10.2.3 Impacts and Mitigation Measures

Project Impacts

Impact WQ-1: Violation of any water quality standards or waste discharge requirements or other degradation of surface water or groundwater quality (less than significant with mitigation)

Construction-related earth-disturbing activities associated with the project would introduce the potential for increased erosion and sedimentation, with subsequent effects on drainage and water quality. During construction, trenching, site preparation, and other construction activities would create areas of bare soil that can be exposed to erosive forces. Bare soils are much more likely to erode than vegetated areas because of the lack of dispersion, infiltration, and retention properties created by covering vegetation. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading could result in increased erosion and sedimentation that can increase sediment discharge to surface waters, if proper BMPs are not used.

The extent of earth disturbance resulting from construction of the project is anticipated to result in a new and intensified potential for the release of sediments from staging areas and turbine construction sites. If precautions are not taken to contain or capture sedimentation, earth-disturbing construction activities could result in substantial sedimentation in stormwater runoff and result in a significant impact on existing surface water quality.

Project operation is not anticipated to result in a substantial amount of additional runoff that would degrade surface or groundwater quality. Implementation of PEIR Mitigation Measure WQ-1*, Comply with NPDES requirements*, would minimize the potential erosion- and sedimentation-related water quality impacts by requiring implementation of erosion control BMPs and a SWPPP. Implementation of PEIR Mitigation Measure WQ-1 would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Project contractors will obtain coverage under the Construction General Permit before the onset of any construction activities, because the Project would disturb 1 acre or more. A SWPPP will be developed by a qualified engineer or erosion control specialist in accordance with the appropriate Water Board's requirements for NPDES compliance and implemented prior to the issuance of any grading permit. The SWPPP will be kept onsite during construction activities and will be made available upon request to representatives of the Regional Water Boards.

Compliance and coverage with the local stormwater management programs and Construction General Permit will require controls of pollutant discharges that utilize BMPs and technology to reduce erosion and sediments to meet water quality standards. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater and other nonpoint-source runoff. Measures range from source control, such as reduced surface disturbance, to the treatment of polluted runoff, such as detention basins.

BMPs to be implemented as part of the *Storm Water Management Program* and Construction General Permit (and SWPPP) may include the following practices.

- Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed to control erosion from disturbed areas.

- Use a dry detention basin (which is typically dry except after a major rainstorm, when it will temporarily fill with stormwater), designed to decrease runoff during storm events, prevent flooding, and allow for off-peak discharge. Basin features will include maintenance schedules for the periodic removal of sediments, excessive vegetation, and debris that may clog basin inlets and outlets.
- Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways.
- Ensure that no earth or organic material will be deposited or placed where it may be directly carried into a stream, marsh, slough, lagoon, or body of standing water.
- Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete, solvents and adhesives, thinners, paints, fuels, sawdust, dirt, gasoline, asphalt and concrete saw slurry, and heavily chlorinated water.
- Ensure that grass or other vegetative cover will be established on the construction site as soon as possible after disturbance.

The contractor will select a combination of BMPs (consistent with the Construction General Permit) that is expected to minimize runoff and remove contaminants from stormwater discharges. The final selection of BMPs will be subject to approval by the San Francisco Bay Regional Water Board and the Central Valley Water Board.

The contractor will verify that a notice of intent has been filed with the State Water Board and that a SWPPP has been developed before allowing construction to begin. The contractor will perform inspections of the construction area, to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The contractor will notify the appropriate Regional Water Board immediately if there is a noncompliance issue and will require compliance. If necessary, the contractor or their agent will require that additional BMPs be designed and implemented if those originally constructed do not achieve the identified performance standard.

Impact WQ-2: Substantial decrease of groundwater supplies or substantial interference with groundwater recharge such that the project may impede sustainable groundwater management of the basin (less than significant)

Project construction of new turbine foundations would involve relatively small footprints, compared with the size of the entire groundwater basin, and, therefore, would not result in blocking groundwater infiltration or interfere with groundwater recharge. The project would require water on a temporary basis during construction, and a minimal amount of water during project operation.

Water for construction activities would be provided through an agreement with municipal or private suppliers. Temporary onsite water tanks and water trucks would be made available for fire water support, dust suppression, and construction needs. Daily water use would vary, depending on the weather conditions and time of year, both of which affect the need for dust control. Hot, dry, windy conditions would necessitate greater amounts of water. Tanker trucks would apply water to construction areas where needed to aid in road compaction and reduce construction-generated dust.

Water required for construction worker needs (drinking water, sanitation facilities) would be trucked in or delivered as bottled drinking water. A local sanitation company would provide and maintain appropriate construction sanitation facilities. Portable toilets would be placed at each of the temporary construction staging areas. When necessary, additional facilities would be placed at specific construction locations. Appropriate BMP training would be provided to truck operators to prevent runoff from dust suppression and control activities. Water used for cement mixing and truck washing would be managed in accordance with applicable permit conditions (and BMPs).

In general, operation of wind power facilities require very little water, and water consumption savings in California from wind power projects amount to more than 3.4 billion gallons per year (CalWEA 2020). The Alameda County Water District reports that industrial uses account for approximately 3,300 acre-feet per year of water provided by the district (ACWD 2020a). Operation of the project could use up to 1.7 acre-feet of water per year, which represents approximately 0.5 percent of the water the district estimates for industrial uses. The average single-family home in Alameda County uses approximately 200 gallons of water per days, or 73,000 gallons of water a year (ACWD 2020b.). Therefore, the project site would use the yearly water equivalent of approximately 8 single-family homes. This water demand is anticipated to be accommodated within the County's water management plan without the need for additional water supplies. As such, the project would not be a source of groundwater extraction.

Based on the above, the project would not result in a substantial decrease of groundwater supplies or substantially interfere with groundwater recharge such that the project would impede sustainable groundwater management of the basin. Therefore, this impact would be less than significant and no mitigation is required.

Impact WQ-3: Substantial alteration of existing drainage patterns in a manner that would result in substantial erosion or siltation onsite or offsite (less than significant with mitigation)

The project would not substantially alter the existing drainage pattern in the area. Project drainage has been considered in the design. Culverts are generally installed as part of the road drainage system on slopes, although some are installed at small stream crossings. Existing culverts may need to be replaced with larger culverts or reinforced to provide adequate size and strength for construction vehicles.

Vegetation would be cleared and the staging areas would be level graded or mostly level. The staging area would use native material, supplemented with gravel or soil stabilizer, if needed, and appropriate erosion control devices (e.g., earth berm, silt fences, straw bales) would be installed to manage water runoff. Diversion ditches would be installed, as necessary, to prevent stormwater from running onto the site from surrounding areas. Following completion of construction activities, the contractor would reclaim and restore the temporary construction staging areas. The gravel surface would be removed, and the areas would be contour graded (if necessary and if environmentally beneficial) to conform to the natural topography. Stockpiled topsoil would be replaced, and the area would be stabilized and reseeded with an appropriate seed mixture.

BMPs would be implemented consistent with standard practice and with the requirements of the PEIR as well as any state or federal permits to minimize soil erosion, sedimentation of drainages downslope of the project site, and any other environmental impacts. Examples of likely erosion control measures include:

- Reseeding and restoration of the site.
- Maintenance of erosion control measures.
- Regular inspection and maintenance of erosion control measures.

In addition, no turbines would be constructed in areas that would disturb drainage areas, and project facilities would be designed to avoid any downstream erosion during the rainy season. Implementation of PEIR Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not result in substantial erosion or downstream siltation. Further, the project would be required to adhere to the NPDES Construction General Permit. Implementation of PEIR Mitigation Measure WQ-1 would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-4: Substantial increase in the amount of surface runoff in a manner that would result in flooding onsite or offsite (less than significant with mitigation)

Changes in impervious cover associated with project construction would not cause a substantial increase in the amount of surface runoff that would result in flooding. Up to 36 new wind turbine foundations would be added to the project site as well as meteorological tower foundations. Small concrete pads within the substation footprint would also be added. New and expanded roads would be constructed to accommodate the new, larger turbines. Road infrastructure upgrades would include grading, widening, and resurfacing some of the existing roads on the project site, and some sections of new road would be constructed where no roads currently exist. Altogether the features listed above would add approximately 2.8 acres of gravel and concrete surfaces. However, they would not introduce new impervious surfaces. Although these features would result in an increase in the extent of graveled and concrete surfaces (which can result in increased runoff), the soils underlying the project site are predominantly high runoff soils due to their shrink-swell potential (i.e., Hydrologic Soil Group D) (Natural Resources Conservation Service 2016). Compacted gravel roads have runoff potential similar to that of Hydrologic Soil Group D soils. Consequently, the additional graveled roads and concrete pads would not result in a net increase in runoff potential compared with existing native soils where the new materials would be placed. Because runoff would not increase as a result of additional gravel and concrete surfaces, there would not be an increase in flooding onsite or offsite. In addition, project construction would be required to comply with the NPDES stormwater Construction General Permit, which requires that post-construction runoff management measures be implemented if the project's SWPPP determines that a project could cause an increase in peak runoff flows from the project site. Implementation of PEIR Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not result in flooding onsite or offsite. Implementation of PEIR Mitigation Measure WQ-1 would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-5: Creation of or contribution to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (less than significant with mitigation)

The project site does not have any existing stormwater drainage facilities, and none are planned. Construction of the project would not increase the rate of polluted runoff. However, construction could generate polluted runoff because soil would be stripped, bare areas exposed, and sedimentation from stormwater could result. Implementation of PEIR Mitigation Measure WQ-1 and BMPs provided in the SWPPP would ensure that project-related stormwater runoff would not affect water quality and that there would be no increase in the rate of polluted runoff. Implementation of PEIR Mitigation Measure WQ-1 would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-6: Obstruction or redirection of flood flows caused by drainage modifications (no impact)

Because the project site is not within a 100-year flood zone, the area is not subject to flood flows. In addition, the project site includes existing infrastructure such roads, and transmission lines. Project construction would include new and upgraded roads, and up to 36 new turbines. The existing onsite drainage pattern would be maintained. In the event of a flood, new features would not substantially obstruct or redirect flood flows, as similar features are already present on site. There would be no impact.

Impact WQ-7: In flood hazard, tsunami, or seiche zones, risk of release of pollutants as a result of project inundation (less than significant with mitigation)

The project is not near a large body of water capable of producing a seiche event, and is approximately 45 miles east of the Pacific Ocean and not subject to a tsunami event. If the Bethany Reservoir Dam were to fail, the likelihood of significant flood risk is considered minimal. Potential release of pollutants as a result of project inundation could occur during construction involving sediment- or contaminated runoff from disturbed work areas or potential spills that could result in temporary impacts on water resources. However, BMPs such as runoff control measures, including stabilizing construction areas, and sediment controls and filtration, would be implemented to minimize impacts on water resources. Furthermore, the SWPPP, which includes provisions to reduce and control discharges other than stormwater, would be implemented.

Due to the minimal change in impervious area because of the impervious nature of soils present at the project site, there would be no substantial reduction of water infiltration into the ground, and risk of release of pollutants as a result of project inundation would be minimal during project operation. In addition, standard facilities used to handle stormwater would include diversion ditches used to prevent stormwater from running onto the site from surrounding areas, and would serve to manage, direct, and convey stormwater and flood water. Implementation of PEIR Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would be properly managed to reduce the risk of release of pollutants as a result of project inundation. With implementation of PEIR Mitigation Measure WQ-1, the impact would be less than significant.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-8: Conflict with or obstruction of implementation of a water quality control plan or sustainable groundwater management plan (less than significant with mitigation)

The project site is within the jurisdiction of the Central Valley Water Board, and subject to the boards' basin plan. The project would include stormwater BMPs, as required by PEIR Mitigation Measure WQ-1, to protect water quality and beneficial uses, as defined in the basin plan. Implementation of the Project SWPPP would also regulate discharges to ensure compliance with the basin plan's water quality standards, and would not conflict with or obstruct implementation of a water quality control plan. Adequate water supply is available to meet the needs of the project for both construction and operation activities, and would not decrease groundwater supplies. The project would only minimally affect groundwater resources because excavation would be temporary and short-term during the construction period. Due to the existing soils impervious nature, the increase of gravel and concrete to the project site would not substantially reduce or interfere with water infiltration into the ground and associated groundwater recharge or depletion of groundwater supplies that would conflict with implementation of sustainable groundwater management would not occur. As a result, the project would not conflict with or obstruct the implementation of a water quality control plan or sustainable groundwater management plan. With implementation of PEIR Mitigation Measure WQ-1, the impact would be less than significant.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

3.10.3 References Cited

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3.11 Land Use and Planning

This section describes the regulatory and environmental setting for land use and planning at the project site. It also describes impacts on land use and planning that could result from implementation of project.

3.11.1 Existing Conditions

3.11.1.1 Regulatory Setting

Federal

There are no federal regulations regarding land use and planning that apply to the project.

State

All cities and counties are required by the state to adopt a general plan establishing goals and policies for long-term development, protection from environmental hazards, and conservation of identified natural resources (California Government Code 65300). California Government Code Section 65302 lists seven elements or chapters that cities and counties must include in their general plans: land use, circulation, housing, conservation, open space, noise, and safety.

Of the mandatory general plan elements, the land use element typically has the broadest scope. This central element describes the desired distribution, location, and extent of the jurisdiction's land uses, which may include housing; business; industry; open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty; education, and public buildings and grounds; and solid and liquid waste disposal facilities.

Local

As stated above, land use and planning are the province of local governments in California. General plans lay out the pattern of future residential, commercial, industrial, agricultural, open space, and recreational land uses within a community. To facilitate implementation of planned growth patterns, general plans typically also include goals and policies addressing the coordination of land use patterns with the development and maintenance of infrastructure facilities and utilities.

Local jurisdictions implement their general plans by adopting zoning, grading, and other ordinances. Zoning identifies the specific types of land uses that are allowed on a given site and establishes standards for new development.

Lands within the project site are planned and managed according to the *Alameda County General Plan*, which is split into three area plans; the project site falls within the area covered by the *East County Area Plan* (ECAP).

East County Area Plan

The ECAP guides the future development and resource conservation within unincorporated eastern Alameda County, which encompasses more than 400 square miles around the cities of Dublin, Livermore, and Pleasanton, and east of Hayward. This area extends from the Pleasanton/Dublin ridgeline on the west to the San Joaquin County line on the east and from the Contra Costa County line on the north to the Santa Clara County line on the south.

The ECAP contains goals, policies, and procedures regarding land use, including urban and rural development, sensitive lands and open space, public facilities, and special land uses (Alameda County 2000). Several of its land use policies and programs apply to the project. Various ECAP policies specifically relating to selected environmental resources (e.g., aesthetics, hazards and hazardous materials, noise) are presented in the regulatory setting discussions of those resource sections.

Relevant general open space land use policies are listed below.

Policy 52: The County shall preserve open space areas for the protection of public health and safety, provision of recreational opportunities, production of natural resources (e.g., agriculture, windpower, and mineral extraction), protection of sensitive viewsheds (see definition in Table 1 [of East Area County Plan]), preservation of biological resources, and the physical separation between neighboring communities (see Figure 4 [of East Area County Plan]).

Policy 53: The County shall preserve a continuous band of open space consisting of a variety of plant communities and wildlife habitats to provide comprehensive, rather than piecemeal, habitat conservation for all of East County. This open space should, as much as possible, be outside of the Urban Growth Boundary and contiguous to large open space areas of Contra Costa, Santa Clara, and San Joaquin Counties.

Policy 70: The County shall work with the East Bay Regional Park District (EBRPD), the Livermore Area Recreation and Park District (LARPD), and other relevant agencies to ensure that open space trails adjacent to San Joaquin, Contra Costa, and Santa Clara Counties connect with trail systems in these other counties.

Relevant agriculture land use policies are listed below.

Policy 71: The County shall conserve prime soils (Class I and Class II, as defined by the USDA Soil Conservation Service Land Capability Classification) and Farmland of Statewide Importance and Unique Farmland (as defined by the California Department of Conservation Farmland Mapping and Monitoring Program) outside the Urban Growth Boundary.

Policy 89: The County shall retain rangeland in large, contiguous blocks of sufficient size to enable commercially viable grazing.

Policy 92: The County shall encourage the retention of existing large parcels of greater than 320 acres in remote areas designated "Large Parcel Agriculture" or "Resource Management," where the parcels are not well served by roads, infrastructure, and services.

Relevant windfarm land use policies are listed below.

Policy 169: The County shall allow for continued operation, new development, redevelopment, and expansion of existing and planned windfarm facilities within the limits of environmental constraints.

Policy 170: The County shall protect nearby existing uses from potential traffic, noise, dust, visual, and other impacts generated by the construction and operation of windfarm facilities.

3.11.1.2 Environmental Setting

The project site is located on 29 privately-owned parcels extending over approximately 4,600 acres within the Altamont Pass Wind Resource Area (APWRA). Livermore, approximately 7 miles west of the project site, is the nearest established community to the project site. The project site is mostly treeless and characterized by rolling foothills of annual grassland. Land use on the project site and the surrounding APWRA consists largely of cattle-grazed land supporting operating wind turbines and ancillary facilities. Many of the parcels on the project site were previously used for wind production. The project sponsor has a long-term easement agreement with the landowner to install, operate, and maintain repowered wind turbines while allowing ongoing agricultural activities (i.e., ranching operations) to continue.

The project site is zoned A (Agriculture), which is intended to promote implementation of general plan land use proposals (or designations) for agricultural and other nonurban uses. The ECAP designates the project site Large Parcel Agriculture. Permitted uses include a variety of agricultural and agricultural support uses. Wind generation is a conditionally permitted use, and privately owned wind electric generators surround the project site.

3.11.2 Environmental Impacts

This section describes the impact analysis relating to land use at the project site. It describes the methods used to determine project impacts and identifies the thresholds used to conclude whether an impact would be significant.

3.11.2.1 Methods for Analysis

The analysis of land use within the project site involved review of the Alameda County Zoning Map, General Plan Land Designation Map, the PEIR, and other applicable land use plans to determine whether any land uses would be adversely affected. CEQA does not require an assessment of the degree to which a project conforms to land use policy or promotes general plan goals or objectives, with the exception of policies that have been adopted specifically to protect an environmental resource addressed by CEQA.

3.11.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Physical division of an established community.
- Conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

3.11.2.3 Impacts and Mitigation Measures

Impact LU-1: Physical division of an established community (no impact)

The project would not divide an established community. The project site is in a rural region of Alameda County primarily used for cattle grazing and wind energy production. The project would use existing roads where possible, with some temporary road widening and the construction of some new roads to facilitate installation of the turbines. There are no established communities within the project site. Therefore, the project would not divide an established community. There would be no impact and no mitigation is required.

Impact LU-2: Conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect (no impact)

The project would entail the installation of up to 36 new wind turbines on the project site. The 518 old generation turbines and towers, along with the turbine foundations, were decommissioned and removed in 2016. The project site currently supports cattle-grazing and includes several livestock handing and staging areas along with the parcels previously used for wind production. The operation of wind turbines constitutes a conditionally permitted use in the Large Parcel Agriculture designation. The project would be consistent with ECAP open space land use policies, including Policy 52, preserving open space areas for windpower production, and Policy 53, preserving open space for plant communities and wildlife habitats outside of the Urban Growth Boundary. The project would also consistent with ECAP agricultural policies, including Policy 89, retaining rangeland in large, contiguous blocks to enable grazing. The project would be consistent with ECAP policies specific to windfarms, including Policy 169, which allows for the redevelopment and expansion of existing and planned windfarm facilities, and Policy 170, which protects existing uses from potential traffic, noise, dust, visual and other impacts generated by the construction and operation of windfarm facilities. Therefore, the project would not conflict with any applicable land use plan, policy, or regulation, including the *Alameda County General Plan*, the ECAP or the Alameda County Zoning Ordinance. Accordingly, project implementation would not result in any changes to existing land uses or pose any land use conflicts. There would be no impact. No mitigation is required.

3.11.3 References Cited

3.11.3.1 Printed References

Alameda County. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.

3.12 Noise

This section describes the environmental setting and regulatory setting for noise. It also describes the noise impacts, if any, that would result from implementation of the project. Where applicable, mitigation measures are described that would reduce significant impacts.

3.12.1 Existing Conditions

3.12.1.1 Regulatory Setting

Federal, state, and local agencies regulate different aspects of environmental noise. Generally, the federal government sets noise standards for transportation-related noise sources closely linked to interstate commerce. These include aircraft, locomotives, and trucks. The state government sets noise standards for transportation noise sources such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. Local general plans identify general principles intended to guide and influence development plans.

For this project, Alameda County sets noise standards for temporary construction noise through the county code, and for permanent operation of wind turbines through Conditional Use Permit sound level performance standards.

Alameda County General Plan Noise Element

The *Alameda County General Plan* Noise Element (Alameda County 1976) contains goals, objectives, and implementation programs for the entire county to provide its residents with an environment that is free from excessive noise and that promotes compatibility of land uses with respect to noise. The Noise Element does not explicitly define the acceptable outdoor noise level for the backyards of single-family homes or common outdoor spaces of multi-family housing projects, but it recognizes the U.S. Environmental Protection Agency noise level standards for residential land uses. These standards are an exterior L_{dn} of 55 A-weighted decibels (dBA) and an interior L_{dn} of 45 dBA. (The L_{dn} measurement, which also includes a 10 dB weighting for night-time sound, is approximately equal to the community noise equivalent level for most environmental settings.) The Noise Element also references noise and land use compatibility standards developed by an Association of Bay Area Governments-sponsored study.

Alameda County East County Area Plan

Alameda County's East County Area Plan (Alameda County 2000) contains the following goal, policies, and implementation programs related to community noise and windfarms.

Goal: To minimize East County residents' and workers' exposure to excessive noise.

Policies

Policy 170: The County shall protect nearby existing uses from potential traffic, noise, dust, visual, and other impacts generated by the construction and operation of windfarm facilities.

Policy 288: The County shall endeavor to maintain acceptable noise levels throughout East County.

Policy 289: The County shall limit or appropriately mitigate new noise sensitive development in areas exposed to projected noise levels exceeding 60 dB based on the California Office of Noise Control Land Use Compatibility Guidelines.

Policy 290: The County shall require noise studies as part of development review for projects located in areas exposed to high noise levels and in areas adjacent to existing residential or other sensitive land uses. Where noise studies show that noise levels in areas of existing housing will exceed “normally acceptable” standards (as defined by the California Office of Noise Control Land Use Compatibility Guidelines), major development projects shall contribute their pro-rated share to the cost of noise mitigation measures such as those described in Program 104.

Implementation Programs

Program 74: The County shall amend the Zoning Ordinance to incorporate siting and design standards for wind turbines to mitigate biological, visual, noise, and other impacts generated by windfarm operations.

Program 104: The County shall require the use of noise reduction techniques (such as buffers, building design modifications, lot orientation, sound walls, earth berms, landscaping, building setbacks, and real estate disclosure notices) to mitigate noise impacts generated by transportation-related and stationary sources as specified in the California Office of Noise Control Land Use Compatibility Guidelines.

Alameda County Noise Ordinance

Alameda County’s noise ordinance (County General Code, Chapter 6.60) allows higher noise exposure levels for commercial properties than for residential uses, schools, hospitals, churches, or libraries. These standards augment the state-mandated requirements of the Alameda County Building Code, which establishes standards for interior noise levels consistent with the noise insulation standards in the California State Building Code. Table 3.12-1 shows the number of cumulative minutes that an exterior noise level is permitted when emanating from a single source, as well as the maximum noise allowed under the Alameda County General Code.

Table 3.12-1. Alameda County Exterior Noise Standards

Cumulative Number of Minutes in Any 1-Hour Time Period Daytime	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Residential uses, schools, hospitals, churches, and libraries		
30	50 dBA	45 dBA
15	55 dBA	50 dBA
5	60 dBA	55 dBA
1	65 dBA	60 dBA
Maximum	70 dBA	65 dBA
Commercial uses		
30	65 dBA	60 dBA
15	70 dBA	65 dBA
5	75 dBA	70 dBA
1	80 dBA	75 dBA
Maximum	85 dBA	80 dBA

Source: Alameda County General Code, Chapter 6.60.
dBA= A-weighted decibels.

The County Zoning Ordinance (County General Code, Chapter 17) restricts noise from commercial activities by prohibiting any use that would generate a noise or vibration that is discernible without instruments beyond the property line. This performance standard does not apply to transportation activities or temporary construction work.

The provisions of the ordinance do not apply to noise sources associated with construction, provided the activities do not take place before 7 a.m. or after 7 p.m. on any day except Saturday or Sunday, or before 8 a.m. or after 5 p.m. on Saturday or Sunday.

Conditional Use Permits

The PEIR refers to the County's conditional use permits (CUPs) for the operation of windfarms regulated by Resolution Number R-2005-463. The following specific condition regarding noise levels is stated:

> Noise Standards: Wind turbines shall be operated so as to not exceed the County's noise standard of 55 dBA (L_{dn}) or 70 dBC (L_{dn}) as measured in both cases at the exterior of any dwelling unit. If the dwelling unit is on land under lease from the Permittee, the applicable standard shall be 65 dBA (L_{dn}) and 70 dBC (L_{dn}).

The County has determined that use of a single 55 L_{dn} standard will be sufficient to ensure that no 70 C-Weighted Decibel (dBC) threshold is exceeded. Research and analysis indicate that a low-frequency noise level of 70 dBC could not be reached unless the noise level were also well over the 55 L_{dn} threshold.

The resolution approving the CUPs for windfarm operations included a finding that as a land use, the wind energy use "is properly related to other land uses and transportation and service facilities in the vicinity, in that… d) Although some residents may object to the visual, noise, or other effects of the turbines, the County has determined that the wind energy projects are in compliance with the conditions of approval and are an acceptable use in the area."

The PEIR identifies thresholds for assessing the significance of noise impacts from wind turbine operations. The PEIR states that a project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Exposure of residences to noise from new wind turbines in excess of 55 dBA (L_{dn}) where wind turbine noise is currently less than 55 dBA (L_{dn}). In the situation where the dwelling unit is on the same parcel being leased for windfarm, 65 dBA (L_{dn}) is used as the threshold.
- Exposure of residences to a daily noise increase in L_{dn} value of more than 5 dB from the addition of new wind turbines where the existing noise level is in excess of 55 dBA (L_{dn}). In the situation where the dwelling unit is on the same parcel being leased for windfarm, 65 dBA (L_{dn}) is used as the threshold.
- Exposure of residences to equipment noise associated with construction activities that exceed Alameda County noise ordinance standards during nonexempt hours (7 p.m. to 7 a.m. on weekdays and 5 p.m. to 8 a.m. on Saturday and Sunday).

The PEIR concluded that significant noise impacts could result during decommissioning of existing turbines, construction of new turbines, and operation of new wind turbines in the program area, and the PEIR identified mitigation measures to reduce these impacts to a less-than-significant level.

3.12.1.2 Environmental Setting

The project site is located within Alameda County. Land around the project site consists largely of cattle-grazed land with a low density of single-family residences. There is one residence within the project site (Mulqueeney Ranch), located on Patterson Pass Road south of the PG&E Tesla substation. Outside the project site, there are a few scattered residences along Midway Road and Patterson Pass Road, all of which are located more than 2,000 feet from the project site boundary. Primary sources of noise are local traffic, aircraft overflights, a substation and wind turbines currently in operation on adjacent lands.

3.12.2 Environmental Impacts

3.12.2.1 Methods for Analysis

Construction

The assessment of potential construction noise levels was based on methodology developed by the Federal Transit Administration (Federal Transit Administration 2018). Potential effects associated with construction of the project would be temporary, intermittent, and would cease once construction is complete. Construction would primarily involve the use of cranes, graders, and trucks. High-impact equipment types such as impact-hammer pile drivers are not expected to be used during construction of the project. Individual types of construction equipment would generate maximum noise levels ranging from 74 to 85 dBA at a distance of 50 feet. The construction noise level at a given receiver location depends on the type of construction activity and the distance and shielding between the activity and noise-sensitive receivers.

The Federal Transit Administration has developed suggested noise limits for construction noise. For residences, a construction noise impact is considered to occur if equipment noise levels exceed 80 dBA L_{eq} (8-hour) during daytime hours (7:00 a.m. to 10:00 p.m.)

Wind Turbines

The Alameda Pass Wind Resource Area Repowering PEIR includes a mitigation measure that defines a minimum setback distance for assessment of an increase in noise levels from a wind turbine project within the APWRA, relative to existing ambient noise levels. This setback distance is specified in the PEIR as a minimum 2,000 feet from a residence to the nearest turbine. At noise-sensitive receiver locations within 2,000 feet of the nearest project turbine location, noise levels should be measured over a one-week period to establish existing noise levels at receivers that would potentially be exposed to levels exceeding the standard of 55 L_{dn} established in the CUP.

3.12.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Generation of increased ambient noise levels in the Project vicinity in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- Generation of excessive groundborne vibration or groundborne noise levels.

- Placement of Project-related activities in the vicinity of a private airstrip or an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in exposure of people residing or working in the Project area to excessive noise levels.

3.12.2.3 Impacts and Mitigation Measures

Impact NOI-1: Generation of increased ambient noise levels in the project vicinity in excess of applicable standards (less than significant)

Construction

Construction of the wind turbine facilities, access roads, and associated facilities would generally involve the construction phases and equipment shown in Table 3.12-2.

Table 3.12-2. Construction Phases and Equipment

Construction Phase	Equipment
1—Laydown areas, substations and switch yards construction	Road grader, track type dozer, drum type compactor, water truck, truck and lowboy trailer, backhoe/front loader
2—Road construction	Road grader, track type dozer, drum type compactor, water truck, truck and lowboy trailer, backhoe/front loader, excavator, rock crusher
3—Wind turbine generator foundations and batch plant	Road grader, track type dozer, drum type compactor, water truck, truck and lowboy trailer, backhoe/front loader, excavator, rock crusher, cement truck
4—Wind turbine generator delivery and installation	Crane, truck and lowboy trailer, excavator
5—Utility collector line installation	Water truck, backhoe/front loader, trencher, horizontal directional drilling bore machine
6—Cleanup and restoration	Road grader, excavator

Table 3.12-3 summarizes the combined noise level of equipment associated with each construction phase.

Table 3.12-3. Combined Noise Level by Construction Phase

Construction Phase	L_{max} Noise Level at 50 Feet from Source (dBA)	L_{eq} Noise Level at 50 Feet from Source (dBA)
1—Laydown areas, substations and switch yards construction	89	85
2—Road construction	91	87
3—Wind turbine generator foundations and batch plant	95	86
4—Wind turbine generator delivery and installation	84	79
5—Utility collector line installation	86	81
6—Cleanup and restoration	86	82

dBA = A-weighted decibels; L_{eq} = equivalent sound level; L_{max} = maximum sound level.

Based on geometric attenuation of 6 dB per doubling of distance and additional attenuation resulting from ground absorption and atmospheric effects, potential construction noise levels at various distances for each construction phase have been calculated relative to the Alameda County noise ordinance standards. Table 3.12-4 summarizes the results of this analysis and identifies distances within which Alameda County noise standards could be exceeded as a result of construction activities.

Table 3.12-4. Construction Noise Analysis

	Daytime Hours (7 a.m. to 10 p.m.)		Nighttime Hours (10 p.m. to 7 a.m.)	
Construction Phase	Distance (feet) to 70 dBA L_{max}	Distance (feet) to 50 dBA L_{eq}	Distance (feet) to 65 dBA L_{max}	Distance (feet) to 45 dBA L_{eq}
1—Laydown areas, substations and switch yards construction	260	910	385	1,225
2—Road construction	290	1,130	460	1,520
3—Wind turbine generator foundations and batch plant	435	1,035	625	1,390
4—Wind turbine generator delivery and installation	170	545	270	865
5—Utility collector line installation	190	675	285	1,075
6—Cleanup and restoration	205	750	300	1,190

dBA = A-weighted decibels; L_{eq} = equivalent sound level; L_{max} = maximum sound level.

The results in Table 3.12-4 indicate that construction activities may potentially result in noise levels that exceed Alameda County noise ordinance standards. However, construction would be done during hours of day allowed by the county (7:00 a.m. to 7:00 p.m. Monday to Friday, and 8:00 a.m. to 5:00 p.m. on Saturday), and no evening or nighttime construction is anticipated. Therefore, the exposure of residences to equipment noise during construction is considered to be a less-than-significant impact.

Operation

Operation of wind turbines added by the project would result in increased ambient noise levels in the project area. The nearest residence, the on-site Mulqueeney Ranch located south of the PG&E Tesla substation, is approximately 3,200 feet away from the nearest turbine that would be constructed. This is outside of the maximum setback distance of 2,000 feet that would require an operational noise analysis under PEIR Mitigation Measure NOI-1, *Perform project-specific noise studies and implement measures to comply with County noise standards*.

Therefore, sound levels from operation of wind turbines are not expected to exceed performance standards specified in the conditional use permit. This impact is considered to be less than significant. No mitigation is required.

Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels (less than significant)

Construction of access roads, turbines, and associated facilities would involve the use of heavy equipment that may produce vibration that would be perceptible up to a distance of 50 feet away from the vibration source. No impact equipment such as pile drivers is expected to be used during construction. Rubber-tired vehicles such as heavy trucks are not a significant source of vibration. Consequently, project construction activities are not expected to result in perceptible levels of vibration within sensitive buildings. This impact is considered to be less than significant. No mitigation is required.

Impact NOI-3: Placement of project-related activities in the vicinity of a private airstrip or an airport land use plan or within 2 miles of a public airport or public use airport, resulting in exposure of people residing or working in the project area to excessive noise levels (no impact)

The nearest airstrip is Tracy Municipal Airport, a general aviation airport located about 6 miles east of the Project area. There would be no impact. No mitigation is required.

3.12.3 References Cited

3.12.3.1 Printed References

Alameda County. 1976. *General Plan Noise Element*. Adopted January 8. Amended May 5, 1994.

———. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.

Federal Transit Administration. 2018. Transit Noise and Vibration Impact Assessment. FTA Report No. 0123.

3.13 Population and Housing

This section describes the regulatory and environmental setting for population and housing at the project site. It also describes impacts related to population and housing that could result from implementation of the project.

3.13.1 Existing Conditions

3.13.1.1 Regulatory Setting

Federal

There are no relevant federal regulations for population and housing.

State

There are no relevant state regulations for population and housing other than the California Department of Housing and Community Development's (HCD) Regional Housing Needs Assessment, which is discussed below.

Local

Association of Bay Area Governments Regional Housing Need Allocation

The Regional Housing Need Assessment (RHNA) process addresses the need for housing across a range of incomes and in all communities throughout the state. To ensure that adequate housing is available for all income groups, HCD is responsible for determining this regional need in coordination with the Association of Bay Area Governments (ABAG). ABAG is required to distribute the region's share of statewide need to the cities and counties within its jurisdiction.

The purpose of the RHNA is to allocate to cities and counties their *fair share* of the Bay Area's projected housing need by household income groups, which are categorized as very low, low, moderate, and above moderate. The RHNA allocates 1,769 units to unincorporated Alameda County (Association of Bay Area Governments 2020). Alameda County is required to adopt a housing element in compliance with this allocation.

East County Area Plan

The *East County Area Plan* (ECAP) contains goals and policies related to population and housing (Alameda County 2000). Polices related to population and housing are listed below. For additional analysis of program consistency with ECAP goals and policies, refer to Section 3.11, *Land Use and Planning*.

Policy 14: The County shall promote an approximate balance between jobs and housing within East County and shall further promote a range of housing types reflecting the income distribution of the local employment base.

Policy 15: The County shall evaluate all proposed major projects for their effect on the East County jobs/housing ratio and the provision of housing affordable to East County workers as well as the potential impacts on adjacent counties, especially in terms of in-commuting. To the extent feasible, the County shall impose measures on projects in the unincorporated County to reduce potential impacts arising from inadequate provision of housing, and shall encourage the cities to do the same.

3.13.1.2 Environmental Setting

Population

The population of Alameda County in 2010 was 1,536,045 (Association of Bay Area Governments 2020). During the 20-year period from 1990 to 2010, Alameda County's population increased by approximately 18%. During the 20-year period from 2010 to 2030, the population in unincorporated Alameda County is expected to increase by 17.2% to 171,500, with an average growth rate of 4.0% every 5 years. Table 3.13-1 presents the anticipated growth for both the unincorporated county and the county as a whole.

Table 3.13-1. Unincorporated Alameda County and Countywide Population Growth Projections 2010–2040

Year	Unincorporated Alameda County Population	Percent Change		Alameda County Population	Percent Change	
		Incremental	Cumulative		Incremental	Cumulative
2010	145,990	–	–	1,536,045[a]	–	–
2015	151,910	3.9	4.0	1,625,780	5.5	5.8
2020	156,865	3.2	7.4	1,711,460	5.0	11.4
2025	159,995	2.0	9.6	1,776,495	3.7	15.7
2030	163,800	2.3	12.2	1,868,653	4.9	21.7

Source: Plan Bay Area 2018.

Households

There are some scattered rural-residential areas and agricultural housing areas located within the PEIR program area. Between 2000 and 2010, the number of households in the county and in the Bay Area[1] increased by approximately 4.1% and 5.8%, respectively. As shown in Table 3.13-2, ABAG projects that the number of households in unincorporated Alameda County will increase by approximately 10.2% by 2030, with an average increase of approximately 2.4% every 5 years.

[1] The Bay Area consists of nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Table 3.13-2. Unincorporated Alameda County and Countywide Household Growth Projections 2010–2030

Year	Unincorporated Alameda County Households	Percent Change		Alameda County Households	Percent Change	
		Incremental	Cumulative		Incremental	Cumulative
2010	50,810			551,700[a]	–	–
2015	52,020	2.3	2.4	585,475	5.7	6.1
2020	53,700	3.1	5.7	614,965	4.7	11.5
2025	54,870	2.1	8.0	637,395	3.5	15.5
2030	55,980	2.0	10.2	668,285	4.6	21.1

Source: Plan Bay Area 2018.

Employment

ABAG estimates that Alameda County will experience an approximately 27% increase in jobs, from 705,025 jobs in 2010 to 901,080 jobs in 2030. Table 3.13-3 summarizes the projected 5-year incremental increases in jobs in the county as a whole from 2010 to 2030.

Table 3.13-3. Alameda County Jobs and Employed Resident Projections

	2010	2015	2020	2025	2030
Total jobs	705,025	834,230	858,685	877,220	901,080
Employed residents	732,650	878,975	911,725	929,230	959,745
Jobs per employed resident	0.96	0.95	0.94	0.94	0.94

Source: Plan Bay Area 2018

Since 2010, Alameda County has had more employed residents than jobs (Table 3.13-4), which means that workers are commuting out of Alameda County. This trend is expected to continue through 2030. By 2020, Alameda County is projected to have 858,685 jobs and 911,725 employed residents, a ratio of 0.94 jobs for every employed resident (Plan Bay Area 2018).

In 2010, there were approximately 85,400 unemployed persons in Alameda County, an unemployment rate of approximately 10.9%. By 2020, the unemployment rate had fallen to approximately 3.1% (California Employment Development Department. 2020).

3.13.2 Environmental Impacts

This section presents the impact analysis relating to project effects related to population and housing. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant.

3.13.2.1 Methods for Analysis

Identifying the project's impacts on population and housing involves a review of program information presented in the PEIR, Project information, ABAG's *Projections 2040*, and the ECAP.

3.13.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Creation of substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).
- Displacement of a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere.

3.13.2.3 Impacts and Mitigation Measures

Impact POP-1: Creation of substantial population growth either directly or indirectly (no impact)

The project would entail the installation of up to 36 new wind turbines on the project site, replacing the 518 old generation wind turbines that were removed from the project site in 2016. The project would not construct any housing and would therefore not result in a direct increase in population. Indirect population growth is discussed below.

Construction

Construction of the project is expected to take approximately 7 months. Based on data provided for wind energy projects of this size, it is expected that 50 workers would be employed during construction, with a peak workforce of 100 workers. Workers would include millwrights, iron workers, electricians, equipment operators, carpenters, laborers, and truck drivers. Construction of the project would result in a temporary increase in construction-related job opportunities in the local area, but construction of the project would be temporary and would not likely result in household relocation.

Construction workers can be expected to be drawn from the construction employment labor force already residing in the region. These jobs would not be permanent and are not expected to change the 2020 ratio of 0.94 jobs per employed resident. Therefore, employment opportunities provided by construction of the project would not be anticipated to generate population growth. No impact would occur and no mitigation is required.

Operation and Maintenance

Operation and maintenance of the project would be similar to operation and maintenance of existing wind farms in the APWRA. Activities would be conducted year-round, with operation, monitoring, and control of wind turbines performed continuously. Operation and maintenance would require full-time, skilled workers. It is expected that these workers would be sourced from the existing pool of personnel that is employed for operation and maintenance of the existing windfarms. Therefore, operation and maintenance of the project would not be anticipated to create new jobs and or induce population growth or an increased demand for housing.

Existing roads would be used where possible, and temporary widening and some new roads would be necessary. The project would also require installation of underground electrical lines connecting the project to a new substation. The service roads would provide access to various project facilities within the project site, including wind turbines and substations. The purpose of the new electrical infrastructure would be to transfer power generated by the turbines to the regional electrical grid. The roads and electrical infrastructure would be privately owned and would neither extend offsite nor provide convenient connection points for potential offsite development. Therefore, any new infrastructure within the project site would not encourage new development or induce population growth.

The project would allow for generation of electricity for distribution to the electrical grid. The generation of wind energy is necessary to meet the legal requirement for investor-owned utilities, electric service providers, and community choice aggregators to meet state RPS requirements. The project would repower the legacy turbines with current-generation turbines. As the project would provide power to the existing electrical grid, it would not indirectly induce any new population growth in the area. No impact would occur and no mitigation is required.

Impact POP-2: Displacement of a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere (no impact)

The majority of the project site is currently developed for windfarm uses (though there are no existing turbines currently on site) and the remainder of the site is used for cattle grazing. A single-story residential building on Patterson Road is located in the southwestern portion of the project site but would not be affected by the project. The project would not include the demolition or displacement of any existing housing and therefore the project would not displace any people. There would be no impact. No mitigation is required.

3.13.3 References Cited

3.13.3.1 Printed References

Alameda County. 2000. *East County Area Plan*. Adopted May 1994. Oakland, CA. Modified by passage of Measure D, effective December 22, 2000.

Association of Bay Area Governments. 2010. Bay Area Census: Alameda County. Available: www.bayareacensus.ca.gov/counties/AlamedaCounty.htm. Accessed: August 18, 2020.

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California Employment Development Department. 2010. *2014-2024 Local Employment Projections Highlights for Oakland-Hayward-Berkeley MD.* Available: https://www.labormarketinfo.edd.ca.gov/data/employment-projections.html. Accessed: April 26, 2019.

———. 2019. *Labor Force and Unemployment Rates for California Counties*. Available: https://data.edd.ca.gov/Labor-Force-and-Unemployment-Rates/Labor-Force-and-Unemployment-Rate-for-California-C/r8rw-9pxx. Accessed: August 18, 2020.

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rea=0604000001&area=Alameda+County&timeseries=unemployment+rateTimeSeries. Accessed: August 18, 2020.

United States Census Bureau. 2020. National, State, and County Housing Unit Totals: 2010-2019: Annual Estimates of County Housing Units for States: 2010 to 2019. Available here: https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-housing-units.html. Accessed: August 18, 2020.

Plan Bay Area. 2018. Plan Bay Area Projections 2040. Available: http://projections.planbayarea.org/. Accessed November 2018.

3.14 Public Services

This section describes the regulatory and environmental setting for public services. It also describes the impacts on public services that would result from implementation of the project.

3.14.1 Existing Conditions

3.14.1.1 Regulatory Setting

Federal

There are no relevant federal regulations for public facilities and services.

State

There are no relevant state regulations for public facilities and services.

Local

Alameda County

East County Area Plan

The Public Services and Facilities Element, and the Environmental Health and Safety Element of the *East County Area Plan* (ECAP) contain goals, policies, and programs related to fire protection and police services. The following goals and policies are applicable to the project (Alameda County 2000).

Goal: To ensure the prompt and efficient provision of police, fire, and emergency medical facility and service needs.

Policy 241: The County shall provide effective law enforcement, fire, and emergency medical services to unincorporated areas.

Policy 242: The County shall reserve adequate sites for sheriff, fire, and emergency medical facilities in unincorporated locations within East County.

Goal: To minimize the risk to lives and property due to fire hazards.

Policy 324: The County shall require the use of fire resistant building materials, fire-resistant landscaping, and adequate clearance around structures in "high" and "very high" fire hazard areas.

3.14.1.2 Environmental Setting

Fire Protection

The Alameda County Fire Department provides fire protection services to the project site in coordination with the California Department of Forestry and Fire Protection (CalFire). CalFire has responsibility for fire protection and suppression activities within State-designated high fire hazard severity zones known as State Responsibility Areas. The project site lies within areas mapped as "Moderate" and "High" Fire Hazard Severity Zones by CalFire (California Department of Forestry and

Fire Protection 2007). The nearest CalFire facility is Station 26 (Castle Rock) at 16502 Schulte Road in Tracy. According to the PEIR, CalFire responded to approximately eight fires in 2011 and four fires in 2012 related to wind turbines in the portion of the Altamont Pass within Alameda County (Giambrone pers. comm.). Although the Altamont Pass Wind Resource Area is under CalFire jurisdiction, the Alameda County Fire Department (ACFD) would also respond to any wildland fire that could affect the project site. ACFD Station 20 is the closest station to the project area. Station 20 is located at the Lawrence Livermore Laboratory at 7000 East Avenue in Livermore, approximately 5.0 miles from the project area's west boundary. Additional information on fire protection in the project area is in Section 3.19, *Wildfire*.

Law Enforcement

The Alameda County Sheriff's Office provides law enforcement services to unincorporated areas of Alameda County. The station with responsibility for the project area is the Tri-Valley Sub Station at 5320 Broder Boulevard in Dublin. Theft is the most common crime in the Altamont pass area, the theft of copper related to wind turbines and tools that are stored and used to repair wind turbines in particular.

Schools

The project area is in the Livermore Valley Joint Unified School District. However, no school facilities are located within the project area. The nearest school to the project area is Mountain House High School (1090 Central Parkway Mountain House), approximately 3.6 miles northeast of the nearest project border. Mountain House High School is in the Lammersville Joint Unified School District. Bethany Elementary School (570 South Escuela Drive, Mountain House), also in the Lammersville Union School District is approximately 4.1 miles north of the project area. Additionally, the Cordes Elementary School, which is under construction and located 3.4 miles north of the project area, will also be a part of the Lammersville Union District once it opens in 2020 to 2021 (Lammersville 2020).

Parks

Alameda County contains numerous recreational facilities, including regional preserves, parks, and other open space areas. Several such areas provide recreational opportunities near the Project area. Park and recreational facilities are discussed in Section 3.15, *Recreation*.

Libraries

The Project area is in the Alameda County Libraries system, which has 10 locations throughout the County. There are no libraries in the Project area. The nearest Alameda County public library is the Livermore Public Library in the City of Livermore at 998 Bluebell Drive.

3.14.2 Environmental Impacts

This section describes the impact analysis relating to public services for the project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant.

3.14.2.1 Methods for Analysis

Identifying the project's impacts on public services involved a review of the *Alameda County General Plan*, ECAP, the CalFire Hazard Severity Zone Map, as well as through personal consultation with the local fire department and law enforcement officials during the preparation of the PEIR to discuss the existing conditions and potential effects of the program and associated projects. Because no other public facilities (e.g., libraries) exist in or in the vicinity of the project site, they are not discussed below.

3.14.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or creation of a 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 following public services:
  - Fire protection
  - Police protection
  - Schools
  - Parks
  - Other public facilities

3.14.2.3 Impacts and Mitigation Measures

Impact PS-1: Creation of a need for new or physically altered governmental facilities to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, of other public facilities (no impact)

The PEIR considered both the program and associated project impacts on fire protection, law enforcement, schools, and parks under PEIR Impact PS-1a-1, Impact PS-1a-2, Impact PS-1b, and Impact PS-1c and found there would be no impact to any of these public services. Because none of the project changes described in Chapter 2, *Project Description*, would alter or increase project site use since the approval of the PEIR, the project would similarly result in no changes to the findings related to the PEIR's public service impacts. Therefore, this impact analysis incorporates ICF correspondence to both the fire department and sheriff's office conducted during the PEIR.

Fire Protection

CalFire provides fire protection services to the project area. The fire protection facilities and infrastructure required to protect the proposed facilities and employees are already in place and would not change as a result of project construction or operation. The newer generation of wind turbines is generally safer than the original models that exist in the area, resulting in fewer ignition risks (Giambrone pers. comm.). All of the workers that would be employed during construction and operations are expected to reside locally or regionally and, therefore, are a part of the existing demand on fire protection services. The project would not result in the need for new or altered fire protection facilities, such as a new or expanded fire station. There would be no impact. No mitigation is required. See Section 3.19, *Wildfire*, for a discussion of wildland fire impacts and fire prevention requirements.

Law Enforcement

The Alameda County Sherriff's Office provides law enforcement services to the project area. The project would be located entirely on properties with restricted public access. Only authorized access to the project site would be allowed. The site is currently fenced, and the collector substation would be fenced with an additional 12-foot-high chain-link fence to prevent public and wildlife access to high-voltage equipment. Safety signs would be posted in conformance with applicable state and federal regulations around all turbines, transformers, and other high-voltage facilities and along access roads. Vegetation clearance would be maintained adjacent to project ingress and egress points and around the substations, and pad mount transformers (if used). During construction, onsite mobile trailers would be located within the staging areas to support workforce needs and site security.

The construction and operation workers are anticipated to be from the local and regional workforce, and, therefore, are already part of the existing demand on police services. Thus, the project would not require additional police staffing or facilities. There would be no impact. No mitigation is required.

Schools

No residential uses are proposed as part of the project, which would not result in new, permanent jobs that would bring new residents to the area. Therefore, no new students would be generated. Temporary and permanent employees are assumed to reside locally and regionally and their school-aged children are assumed to be part of the existing or anticipated student population. Therefore, implementation of the project would not require the construction or expansion of school facilities. There would be no impact. No mitigation is required.

Parks

There are several regional parks and other open space areas within the vicinity of the project. These facilities are intended to serve a large segment of the regional population. Residential uses are not proposed as part of the project, which would not result in new, permanent jobs that would bring new residents to the area; thus, no direct increase in the number of park users is expected to result from the project. It is anticipated that temporary and permanent employees would already reside locally and regionally, and so would be part of the existing demand on park facilities. There would be no impact. No mitigation is required. Parks are discussed in more detail in Chapter 3.15, *Recreation*.

3.14.3 References Cited

3.14.3.1 Printed References

Alameda County. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.

California Department of Forestry and Fire Protection. 2007. *Adopted Fire Hazard Severity Zone Maps for State Responsibility Areas.* November 7.

Lammersville Unified School District. 2020. *Superintendent's Message.* February. Available: https://www.lammersvilleschooldistrict.net/apps/pages/index.jsp?uREC_ID=1210612&type=d&pREC_ID=1471648. Accessed July 22, 2020.

3.14.3.2 Personal Communications

Giambrone, Bryan. Fire Captain at Morgan Hill Headquarters, Santa Clara Unit. CalFire, California. July 2, 2013—telephone conversation with Lindsay Christensen, ICF International.

Kelly, Ray. Police Sergeant at Tri-Valley Substation. Alameda County Sheriff's Office, California. July 2, 2013—telephone conversation with Lindsay Christensen, ICF International.

3.15 Recreation

This section describes the regulatory and environmental setting for recreation resources in the Altamont Pass Wind Resource Area (APWRA) and the project site. It also describes impacts on these resources that could result from implementation of the project.

3.15.1 Existing Conditions

3.15.1.1 Regulatory Setting

Federal

There are no relevant federal regulations for recreation.

State

There are no relevant state regulations for recreation.

Local

Alameda County

Countywide Recreation Plan

The Recreation Plan, an element of the *Alameda County General Plan*, was adopted in June 1956 and last amended in May 1994. The Recreation Plan provides a guide for private and public acquisition and development of recreation areas and facilities. It contains general planning objectives related to promotion and preservation of recreational opportunities throughout the county.

East County Area Plan

The Public Services and Facilities Element of the *East County Area Plan* contains goals, policies, and programs to ensure the development of local and regional parks throughout the East County Area. The Land Use Element contains various goals, policies and programs regarding Sensitive Lands and Regionally Significant Open Space that apply to recreation that include the following (Alameda County 2000:18, 20).

Goal: To protect regionally significant open space and agricultural land from development.

Policy 52: The County shall preserve open space areas for the protection of public health and safety, provision of recreational opportunities, production of natural resources (e.g., agriculture, windpower, and mineral extraction), protection of sensitive viewsheds, preservation of biological resources, and the physical separation between neighboring communities.

Policy 54: The County shall approve only open space, park, recreational, agricultural, limited infrastructure, public facilities (e.g., limited infrastructure, hospitals, research facilities, landfill sites, jails, etc.) and other similar and compatible uses outside the Urban Growth Boundary.

Policy 70: The County shall work with the East Bay Regional Park District (EBRPD), the Livermore Area Recreation and Park District (LARPD), and other relevant agencies to ensure that open space trails adjacent to San Joaquin, Contra Costa, and Santa Clara Counties connect with trail systems in these other counties.

East Bay Regional Park District Master Plan

The *East Bay Regional Park District Master Plan* (Master Plan) is a policy document that guides the East Bay Regional Park District (EBRPD) in future expansion of parks, trails, and services for its regional parks in Contra Costa and Alameda Counties (East Bay Regional Park District 2013). The Master Plan includes policies for conserving natural and cultural resources; providing for recreational opportunities; and providing for the balanced distribution, acquisition, protection, restoration, management, and development of the regional parks. The 2013 Master Plan Map identifies the current system of regional parks, open spaces, and trails.

3.15.1.2 Environmental Setting

The California Department of Parks and Recreation owns and maintains the nearest parks to the project site; the Carnegie State Vehicular Recreation Area (SVCA) and the Bethany Reservoir State Recreation Area. In addition, Alameda County contains numerous recreational facilities, including major parks and open space areas, local parks, and private recreational facilities. Several such areas provide recreational opportunities within and in the vicinity of the project site. The project site is characterized by rolling hills, few trees, and grazing land. Parks and trails are shown on Figure 3.1-2.

Regional Trails

The EBRPD Master Plan Map identifies several regional trails in the vicinity of the project site (East Bay Regional Park District 2013).

- Brushy Peak to Del Vale.
- San Joaquin to Shadow Cliffs.
- Del Valle to Dam Extension.

The California Aqueduct Bikeway runs near the project site, parallel to the California Aqueduct. It follows Interstate 580 and Interstate 5 near Tracy to the San Louis Reservoir State Recreation Area. This paved trail is maintained by the state and allowed uses include bicycling and pedestrian use (City-Data.com 2020).

Regional Preserves and Recreation Areas

Regional preserves and recreational areas are shown in Figure 3.1-2. The Carnegie SVCA, located one mile south of the project site, is one of eight SVRAs administered by the California Department of Parks and Recreation. The park provides 1,300 acres of riding area for off-highway vehicle users on either side of Tesla Road/Corral Hollow Road. The park is characterized by dry rocky washes, rolling hills and steep, rugged canyons, and offers a professionally designed motocross track. The park offers day uses with hours that vary depending upon the time of year along with a 23-site campground (California Department of Parks and Recreation 2020a). It is considered a potential Regional Recreation Area (East Bay Regional Park District 2013).

Considered under previous repowering studies, the Bethany Reservoir and the Bethany Reservoir State Recreation Area are also located near the project site. The Bethany Reservoir State Recreation Area, located approximately 3.25 miles north of the project site, and separated by Interstate 580 is a place for water-oriented recreation such as wind surfing and fishing, and also contains a bike trail along the California Aqueduct Bikeway (California Department of Parks and Recreation 2020b). It is also considered a potential Regional Recreation Area (East Bay Regional Park District 2013).

3.15.2 Environmental Impacts

3.15.2.1 Methods for Analysis

Identifying the project's impact on recreational resources involved a review of the *East County Area Plan* policies, the EBRPD Master Plan, and the PEIR.

3.15.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Increased 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 or expansion of recreational facilities that might have an adverse physical effect on the environment.

3.15.2.3 Impacts and Mitigation Measures

Impact REC-1: Increased use of existing recreational facilities, resulting in substantial physical deterioration (no impact)

There are no existing neighborhood parks on or in the vicinity of the project site. Existing regional parks and other recreational facilities near the project site would not be affected because the project would not introduce new potential users of parks or other recreational facilities. Construction and operation workers are presumed to reside locally or regionally and, therefore, would be among the existing users of available facilities. The project is not anticipated to increase the use of existing parks or other recreational facilities such that substantial physical deterioration would result or be accelerated. There would be no impact. No mitigation is required.

Impact REC-2: Construction or expansion of recreational facilities that might have an adverse physical effect on the environment (no impact)

The project would not include recreational facilities. It would not require the construction of new or expansion of existing recreational facilities because the project would not generate a significant number of new users of such facilities, as discussed under Impact REC-1. Construction and operation workers are presumed to reside locally or regionally and, therefore, would be among the existing users of area recreational facilities. Because the project would not result in an increased demand for recreational facilities, no new recreational facilities would need to be developed or provided that could have a physical effect on the environment. There would be no impact. No mitigation is required.

3.15.3 References Cited

3.15.3.1 Printed References

Alameda County. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.

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3.16 Transportation

This section describes the regulatory and environmental setting for transportation. It also describes the transportation impacts that would result from implementation of the project.

The analysis of transportation impacts in the PEIR is based on level of service (LOS), which is no longer used as a basis for determining the significance of transportation impacts under CEQA pursuant to Senate Bill 743 (Public Resources Code [PRC] Section 21099 and CEQA Guidelines Section 15064.3). Rather, vehicle miles traveled (VMT) is the appropriate measure for determining the significance of transportation impacts. This section provides an analysis of the project's impacts on VMT in accordance with SB 743.

3.16.1 Existing Conditions

3.16.1.1 Regulatory Setting

Federal and State

The California Department of Transportation (Caltrans) is responsible for operating and maintaining all state-owned roadways and interstate highways in California. The California Vehicle Code Division 15 gives Caltrans discretionary authority to issue special permits for the movement of vehicles and loads exceeding statutory size and weight limitations. A special permit issued by Caltrans is required to authorize the operation of oversize or overweight trucks, both of which would be required for implementation of the project.

Senate Bill 743

On September 27, 2013, Governor Jerry Brown signed SB 743 into law and started a process that fundamentally changed the criteria for determining the significance of a project's transportation impacts under CEQA. Specifically, SB 743 required new criteria that "… promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." [PRC Section 21099(b)(1)]. The legislative intent of SB 743 is to align with statewide goals to reduce greenhouse gas (GHG) emissions, encourage infill development, and improve public health through active transportation.

SB 743 directed the Governor's Office of Planning and Research (OPR) and the California Natural Resources Agency to prepare and adopt revisions to the CEQA Guidelines that reflect this change. [PRC Section 21099(b)(1)] In December 2018, OPR published the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (OPR, 2018) as a service to planners, land use officials, and CEQA practitioners.

On December 28, 2018, the California Natural Resources Agency certified and adopted proposed revisions to CEQA Guidelines Section 15064.3, determining the Significance of Transportation Impacts. The revisions include new criteria for determining the significance of a project's transportation impacts. Specifically, CEQA Guidelines Section 15064.3(a) states, "vehicle miles traveled [VMT] is the most appropriate measure of transportation impacts." With this change, the County may no longer use automobile delay, as measured by LOS or similar measures of vehicular capacity or traffic congestion, as the basis for determining the significance of transportation impacts under CEQA. [PRC Section 21099(b)(2) and CEQA Guidelines Section 15064.3(a)]

CEQA Guidelines Section 15064.3(c) (2019) specifies when these changes take effect. It states, "A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide."

Local

Alameda County

Alameda County's *East County Area Plan* (ECAP) (Alameda County 2000) contains goals and policies to maintain an efficient circulation network in the eastern portion of the county. Among the ECAP's goals are creating and maintaining a balanced multimodal transportation system, cooperating with other regional transportation planning agencies, integrating pedestrian use into the transportation system, and mitigating exceedances of level of service (LOS) standards. According to Policy 193, the traffic LOS standard for major intercity arterials is LOS D. The Alameda County Transportation Commission (CTC), Alameda County's Congestion Management Agency (CMA), has adopted LOS E for Congestion Management Program (CMP) and Metropolitan Transportation System (MTS) roadway segments (e.g. Interstate [I-] 580, I-680, and State Route 84).

LOS standards and travel demand measures, established by the Alameda CTC, are intended to regulate long-term traffic impacts associated with future development, and do not apply to temporary construction activities whose short-term traffic increases end when construction concludes. Further, as stated above, LOS standards may no loner be used as a metric for determining impact significance under CEQA.

Alameda County has neither designated local truck routes nor adopted specific policies regarding management of construction activities. Chapter 12.08 of the Alameda County Code regulates roadway use, including issuance of encroachment permits for work within an Alameda County road right-of-way.

Alameda County General Plan

The Alameda County General Plan consists of three area plans that contain the Land Use and Circulation Elements for their respective geographic areas, as well as area-specific goals, policies and implementation actions for circulation, open space, conservation, safety, and noise. In addition, the General Plan contains Housing, Conservation, Open Space, Noise, Seismic and Safety, and Scenic Route Elements that contain goals, policies, and implementation actions that apply to the entire unincorporated area (Alameda County 2018). Other than the Scenic Route goals and policies that are discussed in Section 3.1, *Aesthetics*, there are no countywide circulation policies related to the project. Countywide transportation plans, such as the Countywide Transportation Plan, and policies are primarily developed and maintained by the Alameda CTC, which serves as Alameda County's CMA.

Alameda County East County Area Plan

The ECAP contains transportation and traffic goals and policies applicable to the project. (Alameda County 2000:43, 50–56). Goals in the ECAP are intended to be general statements of a condition Alameda County wants to achieve, and the associated policies are the focused statements of how

Alameda County will achieve these goals. The goals and policies listed below are considered relevant to the project.

Land Use—Windfarms

Goal: To maximize the production of wind generated energy.

Policy 170: The County shall protect nearby existing uses from potential traffic, noise, dust, visual, and other impacts generated by the construction and operation of windfarm facilities.

Transportation Systems—General Transportation

Goal: To create and maintain a balanced, multi-modal transportation system that provides for the efficient and safe movement of people, goods, and services.

***Policy 179:** The County shall adhere to provisions of the Regional Transportation Plan, Countywide Transportation Plan, and County Congestion Management Program, insofar as they are not inconsistent with the Initiative.

Transportation Systems—Transportation Demand Management

Goal: To reduce East County traffic congestion.

Policy 183: The County shall seek to minimize traffic congestion levels throughout the East County street and highway system.

Policy 184: The County shall seek to minimize the total number of Average Daily Traffic (ADT) trips throughout East County.

Policy 185: The County shall seek to minimize peak hour trips by exploring new methods that would discourage peak hour commuting and single vehicle occupancy trips.

Policy 187: The County shall monitor traffic levels according to East County Area Plan and Congestion Management Program objectives.

Policy 188: The County shall promote the use of transit, ridesharing, bicycling, and walking, through land use planning as well as transportation funding decisions.

Policy 190: The County shall require new non-residential developments in unincorporated areas to incorporate Transportation Demand Management (TDM) measures and shall require new residential developments to include site plan features that reduce traffic trips such as mixed use development and transit-oriented development projects.

Policy 191: The County shall work with cities and the Congestion Management Agency to coordinate land use impact analyses.

Transportation Systems—Streets and Highways

Goal: To complete County-planned street and highway improvements that are attractively designed to integrate pedestrian and vehicle use.

Policy 192: The County shall work with Caltrans to improve the interstate and state highway systems and the County road system according to the street classifications shown on the East County Area Plan Transportation Diagram (see Figure 6 [in ECAP]), consistent with Policy 177.

Policy 193: The County shall ensure that new development pays for roadway improvements necessary to mitigate the exceedance of traffic Level of Service standards (as described below) caused directly by the development. The County shall further ensure that new development is phased to coincide with roadway improvements so that (1) traffic volumes on intercity arterials significantly affected by the project do not exceed Level of Service D on major arterial segments within unincorporated areas, and (2) that traffic volumes on Congestion Management Program (CMP) designated roadways (e.g., Interstate Highways 580 and 680 and State Highway 84) significantly affected by the project do not exceed Level of Service E within unincorporated areas. If LOS E is exceeded, Deficiency Plans for affected roadways shall be prepared in conjunction with the Congestion Management Agency. LOS shall be determined according to Congestion Management Agency adopted methodology. The County shall encourage cities to ensure that these Levels of Service standards are also met within unincorporated areas.

Transportation Systems—Bicycle and Pedestrian Paths

Goal: To include a comprehensive network of bicycle and pedestrian paths in the local and subregional transportation network.

Policy 211: The County shall create and maintain a safe, convenient, and effective bicycle system that maximizes bicycle use.

Policy 214: The County shall require that circulation and site plans for individual developments minimize barriers to access by pedestrians, the disabled, and bicycles (e.g., collectors or arterials separating schools or parks from residential neighborhoods).

Transportation Systems—Aviation

Goal: To ensure the efficient, safe, and economically beneficial operation of the Livermore Municipal Airport.

Policy 217: The County shall require that, where conflicts between a new use and the airport that could interfere with the airport's operations are anticipated, the burden of mitigating the conflicts will be the responsibility of the new use.

Alameda County Congestion Management Program

The Alameda County CMP identifies countywide strategies for managing transportation needs and procedures to reduce congestion. The CMP identifies existing and desired traffic conditions on roadways throughout Alameda County. Patterson Pass Road, the primary access road to the project site, is a CMP designated road. Other CMP-designated roads in the vicinity of the project site are Altamont Pass Road/ Grant Line Road, Vasco Road, and I-580 between I-680 and I-205 (Alameda County Transportation Commission 2017: Chapter 2).

A 2018 LOS monitoring study revealed that segments of I-580 near the project site operated at LOS F, which is worse than the CMP-designed LOS of E, during peak hours: westbound segment from the San Joaquin County line to Grant Line Road during the a.m. peak hour, and eastbound segment from 1st Street in Livermore to North Flynn Road in the unincorporated county during the p.m. peak hour. In addition, northbound North Vasco Road from Scenic Drive to Dalton Avenue in Livermore operated at LOS F during the p.m. peak hour. Eastbound Altamont Pass Road/ Grant Line Road from Greenville Road to the Alameda County line operated at LOS C in during the p.m. peak hour and at LOS A during the a.m. peak hour. Eastbound Patterson Pass Road, which provides access to the project site, operated at LOS C during the a.m. peak hour and at LOS A during the p.m. peak (Alameda County Transportation Commission 2018: Appendix B).

Alameda Countywide Transportation Plan

The Alameda Countywide Transportation Plan is a long-range policy document that guides transportation funding decisions for Alameda County's transportation system through 2040. The plan lays out a strategy for meeting transportation needs for all users in Alameda County. The plan identifies projects and other improvements to new and existing freeways, local streets and roads, public transit (paratransit, buses, rails, ferries), and facilities and programs to support bicycling and walking (Alameda County Transportation Commission 2016). The plan sets the following goals for Alameda County's transportation system.

- Accessible, affordable and equitable for people of all ages, incomes, abilities and geographies.
- Integrated with land use patterns and local decision-making.
- Connected across the county, within and across the network of streets, highways and transit, bicycle and pedestrian routes.
- Multimodal.
- Cost effective.
- Safe.
- Reliable and efficient.
- Well maintained.
- Supportive of a healthy and clean environment.

These goals are aligned with one or more performance categories and performance measurements. The plan also identifies land use and conservation development strategies.

Alameda Countywide Active Transportation Plan

The Alameda Countywide Active Transportation Plan (CATP) combines prior versions of the Countywide Bicycle Plan and Countywide Pedestrian Plan (Alameda County Transportation Commission 2019). The CATP includes a countywide analysis of low stress bike networks, identifies a countywide high injury pedestrian and bicycle network, evaluates major barriers to the bicycle and pedestrian network, and establishes a framework for prioritizing projects of countywide significance to inform decision-making around active transportation funding at Alameda CTC. The CATP also provides resources to member agencies to help advance projects that provide complete, safe, and connected networks for biking and walking, including better connections to the regional transit network.

The broad goals of the CATP include safety for people bicycling and walking, multimodal connectivity between bicycle and pedestrian resources and other transportation resources, encouragement of biking and walking, and impactful investment in projects that improve bicycle and pedestrian systems.

The CATP identifies two policies that are specifically relevant to unincorporated areas. One focuses on providing safe access for students to reach schools in Alameda County, which includes schools in unincorporated areas. The other is the development of an Americans with Disabilities Act (ADA) Transition Plan, which is intended to guide Alameda County staff in considering ADA standards in project planning. The CATP refers to the Alameda County Bicycle and Pedestrian Master Plan for Unincorporated Areas as a source of guidance for active transportation issues in the county's unincorporated areas.

Alameda County Bicycle and Pedestrian Master Plan for Unincorporated Areas

The Bicycle and Pedestrian Master Plan describes existing conditions for bicycling and walking, identifies capital and program improvements to support these modes, and recommends projects to enhance bicycling and walking in the unincorporated areas of Alameda County (Alameda County 2019). This plan includes updates to the 2012 Bicycle and Pedestrian Master Plan, building upon the vision and projects included in this earlier version of the plan. The plan identifies high-priority projects that meet the short-term community needs, as well as strategies for education, funding, and implementation of the recommended projects and programs. This plan provides a vision for bicycling and walking in Alameda County as important alternative transportation modes. The plan also identifies implementable projects that will contribute to a more bicycle and pedestrian-friendly environment in the unincorporated areas.

The Bicycle and Pedestrian Master Plan contains goals and policies for developing and implementing a bikeway system and pedestrian improvements that meet Alameda County's vision for safe, attractive, and convenient opportunities for bicycling and walking for all types of trips and user groups.

Goal 1: Connectivity Develop and maintain a connected and continuous bicycle and pedestrian network.

Policy 1.1: Create and maintain a safe, convenient, and effective bicycle and pedestrian networks that maximize bicycle use and walking for commuting, recreation, and local transportation.

Goal 2: Provide access for all users.

Goal 3: Improve safety for all modes of transportation.

Policy 3.1: Reduce the rate and severity of bicycle and pedestrian collisions.

Goal 4: Consider the whole walking and biking experience through the provision of support facilities.

Goal 5: Build community awareness of walking and biking as an alternative to driving; and an understanding of the safety responsibilities of all users.

Goal 6: Ensure that land uses support and promote walking and bicycling.

Policy 6.1: Require that development projects include bicycle and pedestrian considerations for safety, access/circulation, and amenities such as bicycle parking/lockers and showers, as appropriate.

Policy 6.2: Require that all traffic impact studies and analyses of proposed street changes address impacts on bicycling and pedestrian transportation. Specifically, the following should be considered:

- Consistency with General Plan and the Bicycle and Pedestrian Master Plan policies;
- Impact on the existing and future Bicycle and Pedestrian Master Plan Bikeway System;
- Permanent travel pattern or access changes including the degree to which bicycle and pedestrian travel patterns are altered or restricted due to any change to the roadway network; and
- Conformity to accepted bicycle and pedestrian facility design standards and guidelines.

San Joaquin County

San Joaquin County General Plan

The *San Joaquin County General Plan* consists of Community Development, Public Facilities and Services, Public Health and Safety, and Resources Elements. These elements provide goals and policies for land use, development, preservation, and resource conservation in the unincorporated areas (San Joaquin County 2016). The only general plan transportation goal relevant to the project is Goal TM-3: To maintain a safe, efficient, and cost-effective roadway system for the movement of people and goods. The general plan designates Mountain House Parkway, Grant Line Road, and Byron Road as principal arterials.

San Joaquin County Regional Congestion Management Program

The San Joaquin Council of Governments serves as San Joaquin County's CMA. It updates on a biannual basis the Regional Congestion Management Program (RCMP), which is intended "to ensure that new land uses are developed in tandem with the necessary transportation improvements by coordinating the land use, air quality, and transportation planning processes" (San Joaquin Council of Governments 2018: 1). The RCMP roadway network consists of all state highways in addition to local arterials of regional significance. I-205, I-580, Mountain House Parkway, and Byron Road are RCMP-designated roadways near the project site. The adopted LOS standard for the RCMP is D, although a lower LOS is allowed to account for circumstances such as interregional traffic, road construction activity, freeway ramp monitoring, and high-density or mixed-use development (San Joaquin County of Governments 2018: 28). The RCMP also designates a regional bikeway network; however, no portion of the network is near the project site.

As of 2020, I-205 at the Alameda and San Joaquin County line operated at LOS F in the eastbound direction during the p.m. peak hour, and at LOS F in the westbound direction during the a.m. peak hour. I-580 in San Joaquin County operated at LOS A to D, depending on segment and time of day. Mountain House Road, which is designated as an Urban Roadway in the RCMP, operated at LOS C. Byron Road, also designated as an Urban Roadway in the RCMP, operated at LOS F. (San Joaquin Council of Governments 2020).

3.16.1.2 Environmental Setting

Roadway Network

Highways and county roadways provide access to the project site. Regional access is provided by I-580, a major east-west truck travel route and main throughway in eastern Alameda County that connects I-680 on the west and I-5 on the east (see Figure 1-1). The 2018 annual average daily traffic (AADT) volume on I-580 near Patterson Pass Road, the project site's main access road, was about 162,100 vehicles per day. Trucks accounted for 6.8% to 8.3% of the vehicles traffic (California Department of Transportation 2018). Table 3.16-1 provides Caltrans AADT volumes and data for composition of trucks on highways near the project site.

Table 3.16-1. Annual Average Daily Traffic Volumes on Regional Access Highways

Roadway	Segment Location	2018 AADT	2018 Truck AADT/ Percent of Total AADT
I-580, north of project site	I-205—Greenville Road, Livermore	15,900—159,300	1,988—16,567/ 12.5%—10.4%
I-580, northwest of project site	Greenville Road, Livermore—I-680	162,100—231,100	13,503—15,645/ 8.3%—6.8%
I-580, east of project site	I-5—I-205	21,000—15,900	3,381—1,988/ 16.1%—12.5%
I-205, Tracy	I-580—Junction I-5	160,000—102,000	19,200—11,659/ 12.0%—11.4%
I-680, Dublin	SR 84 East, Pleasanton—Alcosta Boulevard, San Ramon	133,000—165,000	12,236—9,186/ 9.2%—5.3%

Source: California Department of Transportation 2018.
AADT = Annual Average Daily Traffic.

Patterson Pass Road is the primary access route to the project site. The project site contains numerous access roads of various widths and maintenance states. The majority of the roads were used to access the previous old generation wind turbines and for ranching operations. Many county roads in the vicinity have insufficient road base to support heavy, frequent truck loads (Alameda County Transportation Commission 2013b). Table 3.16-2 provides the 2018 LOS Monitoring Report data for Patterson Pass Road.

Table 3.16-2. Peak Hour Traffic Volume and LOS on Patterson Pass Road

Roadway	Segment Location (Direction)	Count Date	Sampling Time	Sampled Traffic Volume (LOS)
Patterson Pass Road	Vasco Road to Alameda County Line (Eastbound)	2018	A.M. Peak Hour	349 (LOS C)
			P.M. Peak Hour	2,878 (LOS A)
	Alameda County Line to Vasco Road (Westbound)	2018	A.M. Peak Hour	2435 (LOS B)
			P.M. Peak Hour	170 (LOS B)

Source: Alameda County Transportation Commission 2018.

Public Transit

There is no public transit service provided in the project site. To the west and south of the project site, Livermore Amador Valley Transit Authority provides the closest bus service. East of the project site, San Joaquin Regional Transit District provides bus service in Mountain House and Tracy. The Altamont Corridor Express train is a commuter train service managed by the San Joaquin Regional Rail Commission for travel between Stockton and San Jose. The passenger train uses the Union Pacific Railroad tracks through the project site, with grade-separated crossings of I-580 and Altamont Pass Road.

Bicycle and Pedestrian Circulation

Bicycle facilities in the cities and communities of Alameda and San Joaquin Counties are classified into three categories: Class I (bike paths) are described as completely separated, off-street, paved right-of-way (shared with pedestrians) paths, which exclude motor vehicle traffic; Class II (bike lanes) are striped lanes for one-way bike travel on a roadway; and Class III (bike routes) are on-street bike routes with signage but no striping. The Alameda County Bicycle Master Plan uses these or similar categories to describe the bikeway network in the unincorporated areas of Alameda County (Alameda County 2012). The San Joaquin County RCMP also uses this terminology (San Joaquin Council of Governments 2018: 19)

The closest existing designated bikeways near the project site are the recreational path along the California Aqueduct, to the east of the project site, and the bikeway that runs along Greenville Road in Livermore to the west of the project site. The Alameda CATP does not identify any existing bicycle facilities in the project site, but Patterson Pass Road is identified as a planned Class III bicycle route (Alameda County Transportation Commission 2019). The East Bay Regional Parks District (EBRPD) Master Plan identifies potential recreation trails to the north and west of the project site that could become part of a larger regional network of pedestrian trails (East Bay Regional Parks District 2013).

Planned bicycle routes in the area would typically not serve a conventional bicycle commuter function, but primarily are intended as recreational and inter-regional access routes. Notably, the area is host to several annual spring, summer and fall bicycle touring, racing and charity events that utilize these rural bike routes.

County roads near the project site generally lack sidewalks, crosswalks, and other pedestrian facilities.

Air Traffic

There are four airports in the vicinity of the project site: Meadowlark Field (a private landing strip) is located about 4.3 miles west of the project site; Tracy Municipal Airport is located about 5.7 miles east of the project site; Byron Airport is located about 7 miles north of the project site; and Livermore Municipal Airport is located about 10.5 miles west of the project site.

3.16.2 Environmental Impacts

This section describes the transportation impact analysis for the project. The section describes the methods used to determine the impacts of the project, lists the thresholds used to conclude whether an impact would be significant, and identifies impacts that would result from project implementation. The section also specifies measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts.

3.16.2.1 Methods for Analysis

The PEIR evaluated traffic impacts for two specific projects in the program area and four future projects, including the proposed project. No project-specific traffic analysis is necessary for the Mulqueeney Ranch Project because the impacts identified as potentially significant in the PEIR (e.g., increased traffic congestion and traffic hazards) would also result from the project and the mitigation measures set forth in the PEIR would adequately address those impacts.

3.16.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities.
- Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.[1]
- Substantial increase in hazards because of a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Potential to cause inadequate emergency access.

3.16.2.3 Impacts and Mitigation Measures

Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities (less than significant with mitigation)

The PEIR concluded that construction activities could cause a substantial traffic increase on local county roads that provide direct access to project construction sites, because these roads generally have low traffic volumes. However, these increases, although they could degrade traffic operations, would be of temporary duration. Implementation of PEIR Mitigation Measure TRA-1, *Develop and implement a construction traffic control plan*, would reduce potential construction-related traffic congestion or circulation issues, and therefore would reduce this impact to a less-than-significant level.

In addition, the PEIR concluded that no public transit services, or pedestrian or bicycle facilities are present on the project access routes in the program area. However, oversized construction vehicles could potentially disrupt the movement of bicycles traveling on the shoulders of Patterson Pass Road, the project's primary access road, Patterson Pass Road, and lane or road closures associated with material deliveries could temporarily disrupt bicycle access.

Implementation of PEIR Mitigation Measure TRA-1b would reduce potential conflicts between oversized and/or delivery vehicles and bicycles, and therefore would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan

Prior to starting construction-related activities, the Applicant shall prepare and implement a Traffic Control Plan (TCP) that will reduce or eliminate impacts associated with the proposed project. The TCP shall adhere to Alameda County, San Joaquin County, and Caltrans requirements, and must be submitted for review and approval of the County Public Works

[1] This impact threshold was removed from Appendix G of the CEQA Guidelines in 2019 but is being retained in this document for consistency with the analysis included in the PEIR.

Department prior to implementation. The TCP shall include the following elements. The County and Caltrans may require additional elements to be identified during their review and approval of the TCP.

- Schedule construction hours to minimize concentrations of construction workers commuting to/from the project site during typical peak commute hours (7 a.m. to 9 a.m. and 4 p.m. to 6 p.m.).
- Limit truck access to the project site during typical peak commute hours (7 a.m. to 9 a.m. and 4 p.m. to 6 p.m.).
- Require that written notification be provided to contractors regarding appropriate haul routes to and from the project site, as well as the weight and speed limits on local county roads used to access the project site.
- Provide access for emergency vehicles to and through the project site at all times.
- When lane/road closures occur during delivery of oversized loads, provide advance notice to local fire, police, and emergency service providers to ensure that alternative evacuation and emergency routes are designated to maintain service response times.
- Provide adequate onsite parking for construction trucks and worker vehicles.
- Require suitable public safety measures in the project site and at the entrance roads, including fences, barriers, lights, flagging, guards, and signs, to give adequate warning to the public of the construction and of any dangerous conditions that could be encountered as a result thereof.
- Complete road repairs on local public roads as needed during construction to prevent excessive deterioration. This work may include construction of temporary roadway shoulders to support any necessary detour lanes.
- Repair or restore the road right-of-way to its original condition or better upon completion of the work.
- Coordinate project-related construction activities, including schedule, truck traffic, haul routes, and the delivery of oversized or overweight materials, with Alameda County, Caltrans, and affected cities and counties to identify and minimize overlap with other area construction projects.
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Impact TRA-2: Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b) (less than significant)

Section 15064.3 subdivision (b) concerns analysis of project impacts based on potential increases in vehicle miles traveled (VMT). The Governor's Office of Planning and Research released a technical advisory on Section 10564.3 subdivision (b), which indicates that without "projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact" (Office of Planning and Research 2018). Construction-related trips would generate a temporary increase in VMT associated with the project. Once operational, the estimated daily VMT associated with the project's routine operations and maintenance would be 213 VMT for two people commuting daily up to 100 miles round trip, far fewer than 110 trips per day (Brookfield

Renewables 2020). Based on OPR's guidance and the nature of the project, VMT impacts would be less than significant.

Impact TRA-3: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? (less than significant)

There are four airports in the vicinity of the project site: Meadowlark Field (a private landing strip); Tracy Municipal Airport; Byron Airport; and Livermore Municipal Airport. The project would not affect existing air traffic patterns at any of the region's airports and therefore would not result in substantial safety risks. I The impact would be less than significant.

Impact TRA-4: Substantial increase in hazards because of a geometric design feature (e.g., sharp curves, dangerous intersections) or incompatible uses (e.g., farm equipment) (less than significant with mitigation)

The PEIR concluded that the presence of large, slow-moving construction and delivery vehicles could increase traffic safety hazards. Additionally, some of these vehicles could exceed roadway load and size limits. Permits from Caltrans District 4 and other relevant jurisdictions would be required for such vehicles. Compliance with permit requirements and implementation of PEIR Mitigation Measure TRA-1 would reduce potential conflicts between roadway users and construction equipment and vehicles this impact to a less-than-significant level.

PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan

Impact TRA-5: Potential to cause inadequate emergency access (less than significant with mitigation)

Large, slow-moving construction and delivery vehicles and temporary road and lane closures could delay or obstruct the movement of emergency vehicles, as disclosed in the PEIR. Implementation of PEIR Mitigation Measure TRA-1 would reduce this impact to a less-than-significant level.

PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan

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3.17 Tribal Cultural Resources

This section describes the regulatory and environmental setting for tribal cultural resources. It also describes the impacts on tribal cultural resources that would result from implementation of the project.

3.17.1 Existing Conditions

3.17.1.1 Regulatory Setting

Assembly Bill 52

Assembly Bill (AB) 52 (Chapter 532, Statutes of 2014) establishes a formal consultation process for California Native American tribes as part of CEQA and equates significant impacts on tribal cultural resources with significant environmental impacts (Public Resources Code [PRC] Section 21084.2). PRC Section 21074 defines *tribal cultural resources* as follows:

- Sites, features, places, sacred places, and objects with cultural value to descendant communities or cultural landscapes defined in size and scope that are either:
    - Included in or eligible for listing in the California Register of Historical Resources (CRHR).
    - Included in a local register of historical resources.
- 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 PRC Section 5024.1.

Sacred places can include Native American sanctified cemeteries, places of worship, religious or ceremonial sites, and sacred shrines. In addition, both unique and non-unique archaeological resources, as defined in PRC Section 21083.2, can be tribal cultural resources if they meet the criteria detailed above. The lead agency relies upon substantial evidence to make the determination that a resource qualifies as a tribal cultural resource when it is not already listed in the CRHR or a local register.

AB 52 defines a *California Native American Tribe* as a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (PRC 21073). Under AB 52, formal consultation with tribes is required prior to determining the level of environmental document if a tribe has requested to be informed by the lead agency of proposed projects and if the tribe, upon receiving notice of the project, accepts the opportunity to consult within 30 days of receipt of the notice. AB 52 also requires that consultation, if initiated, address project alternatives and mitigation measures for significant effects, if specifically requested by the tribe. AB 52 states that consultation is considered concluded when either the parties agree to measures to mitigate or avoid a significant effect on tribal cultural resources, or when either the tribe or the agency concludes that mutual agreement cannot be reached after making a reasonable, good-faith effort. Under AB 52, any mitigation measures recommended by the agency or agreed upon with the tribe may be included in the final environmental document and in the adopted mitigation monitoring program if they were determined to avoid or lessen a significant impact on a tribal cultural resource. If the recommended measures are not included in the final environmental document, then the lead agency must consider the four mitigation methods described in PRC Section 21084.3 (PRC Section

21082.3[e]). Any information submitted by a tribe during the consultation process is considered confidential and is not subject to public review or disclosure. It will be published in a confidential appendix to the environmental document unless the tribe consents to disclosure of all or some of the information to the public.

Consultation requirements under AB 52 only apply to projects with notices of preparation (NOPs) issued after July 1, 2015. Because the NOP for this EIR was issued after July 1, 2015, consultation requirements under AB 52 apply to this project.

3.17.1.2 Environmental Setting

Ethnographic Period

The project site is located on the eastern boundary of the Ohlone traditional land and the western edge of the Northern Valley Yokuts traditional area. Both are briefly described below.

Ohlone (Costanoan)

The territory of the Ohlone people extended along the coast from the Golden Gate in the north to just below Carmel to the south, and as far as 60 miles inland. The territory encompassed a lengthy coastline, as well as several inland valleys (Levy 1978:485–486). The Ohlone were hunter-gatherers and relied heavily on acorns, supplementing their diet with a range of other foodstuffs, such as various seeds (the growth of which was promoted by controlled burning), buckeye, berries, roots, mammals, waterfowl, reptiles, and insects (Levy 1978:491–493). Prior to contact, the Ohlone were politically organized by tribelet, with each having a designated territory. A tribelet was an organizational unit consisting of one or more villages with individuals generally numbering 100 to 250 members (Kroeber 1962). Ohlone villages typically had four types of structures: domed dwellings, sweathouses, oval or round dance structures, and a domed assembly house (Crespi 1927:219; Levy 1978:492).

Northern Valley Yokuts

Yokuts is a term applied to a large and diverse number of people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts are the historical occupants of the central and northern San Joaquin Valley (Wallace 1978:462). Northern Valley Yokut villages tended to congregate around water sources, and relied heavily on fishing (in particular, salmon fishing). They varied their diet with waterfowl and the harvesting of wild plant food, such as acorns, seeds, and tule root (Wallace 1978:464). Most settlements, or at least the principal ones, were built atop low mounds on or near the banks of large watercourses for protection against spring flooding (Schenck 1926:132; Schenck and Dawson 1929:308; Cook 1960:242, 259, 285). Village populations averaged around 300 people, and villages contained oval or round family houses, a community lodge for dances, and a sweathouse (Wallace 1978:465).

Historic Period

The project site is located in the hills adjacent to the Altamont Pass, between the cities of Livermore (to the west, in Alameda County) and Tracy (to the east, in San Joaquin County). The historic cultural setting of the project site is associated with the development of those two areas by Spanish, Mexican and American-era settlers. As such, the historic period saw the displacement by settlers of Native

American communities from lands in the project area, through means such as missionization (Kyle et al., 2002).

Early Settlement of Livermore Valley and San Joaquin Valley (1769–1850s)

As early as 1769, the Spanish explorer José Francisco Ortega led an expedition through present-day Alameda County. Seven years later, Juan Bautista de Anza and Pedro Font traveled through the region. By 1797, Spain established the Misión del Gloriosísimo Patriarca Señor San José, currently referred to as Mission San Jose, 15 miles northeast of the present-day City of San Jose and approximately 20 miles southwest of the project site (Kyle et al., 2002).

Under the direction of Father Fermín Lasuen, Mission San Jose prospered as an agricultural center, grazing sheep and cattle on the land now known as Livermore Valley (Kyle et. al. 2002). However, the mission's success came with a heavy cost to the Ohlone population who inhabited the territory. Many Ohlone were forced to live and work at the mission. Introduced disease, harsh living conditions, and reduced birth rates during this period resulted in a population decline. While the Ohlone number around 10,000 when the mission was established, their population diminished to less than 2,000 by 1832 (Cook 1943a, 1943b).

After the missions were secularized by the Mexican government (around 1830), many Native Americans, including Ohlones, left the missions in an attempt to reestablish their previous lives. Many Ohlone found work as wage laborers on the ranchos and mines or in domestic positions. There was a partial return to aboriginal religious practices and subsistence strategies, but for the most part, the Ohlone culture was greatly diminished (Levy 1978:486–487).

Today, descendants of the Ohlone still live in the area, and many are active in maintaining their traditions and advocating Native American issues.

3.17.2 Environmental Impacts

This section describes the potential impacts of the proposed project on tribal cultural resources and describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant.

3.17.2.1 Methods for Analysis

Cultural resources studies for the project were carried out by ICF cultural resources staff in 2020 (ICF 2020). As part of those efforts, archaeological surveys and outreach efforts to the Native American Heritage Commission (NAHC) were carried out to identify archaeological resources or Sacred Sites that may be considered tribal cultural resources to consulting tribes. As a result of the cultural resource studies, no archaeological resources were identified in the project site.

Sacred Lands File Search

ICF contacted the NAHC on March 11, 2020, to identify any areas of concern within the project site that may be listed in the NAHC's Sacred Land File. The NAHC responded on March 13, 2020 stating that no Sacred Lands were identified within the project site.

AB 52 Outreach and Consultation

On April 6, 2020, the County submitted the Notice of Preparation (NOP) of a Subsequent Environmental Impact Report (SEIR) for the Mulqueeney Ranch Wind Repowering Project to the NAHC. On April 13, 2020, the NAHC responded, acknowledging receipt of the NOP and provided guidance for AB 52 consultation.

On June 6, 2020, ICF emailed letters to the following tribes on the County's behalf, inviting them to consult on behalf of AB 52. Although the tribes had not formally requested notice under PRC Section 21080.3.1(d), they were identified as tribes that are culturally and traditionally affiliated with the project site, and thus the County invited them to participate in consultation under AB 52.

- Andrew A. Galvan, Ohlone Indian Tribe;
- Tony Cerda, Chairperson, Coastanoan Rumsen Carmel Tribe;
- Irenne Zwierlein, Chairperson, Amah Mutsun Tribal Band of Mission San Juan Bautista;
- Monica Arellano, Vice Chairperson, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area;
- Corrina Gould, Chairperson, The Confederated Villages of Lisjan;
- Ann Marie Sayers, Chairperson, Indian Canyon Mutsun Band of Costanoan;
- Katherine Erolinda Perez, Chairperson, North Valley Yokuts Tribe.

When the AB 52 notification letters were sent to the tribes, Executive Order N-54-20 was in effect, which suspended the 30-day response deadline set forth in PRC §21080.3.1 for 60 days. Accordingly, the County requested any requests to consult be submitted by August 12, 2020. By August 12, 2020, the County had not received any responses for Tribal consultation and no tribal cultural resources have been identified in the project site.

3.17.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- A substantial adverse change in the significance of a tribal cultural resource, defined in PRC 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:
  - Listed or eligible for listing in the CRHC, or in a local register of historical resources as defined in PRC Section 5020.1(k), or

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 PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.17.2.3 Impacts and Mitigation Measures

Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource with cultural value to a California Native American tribe and that is 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) (less than significant)

The results from the search of the NAHC's Sacred Lands Files, and outreach efforts by the County pursuant to AB 52, as discussed in the *Methods for Analysis* section, did not identify any tribal cultural resources in or near the project site. Therefore, there would be no significant impact and no mitigation is required.

Impact TCR-2: Potential to cause a substantial adverse change in the significance of a tribal cultural resource with cultural value to a California Native American tribe and that is a resource determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. (less than significant)

The results from the search of the NAHC's Sacred Lands Files, and outreach efforts by the County pursuant to AB 52, as discussed in the *Methods for Analysis* section, did not identify any tribal cultural resources in or near the project site. Therefore, there would be no significant impact and no mitigation is required.

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3.18 Utilities and Service Systems

This section describes the regulatory and environmental setting for utilities and service systems at the project site. It also describes impacts on utilities and service systems that would result from implementation of the project.

3.18.1 Existing Conditions

3.18.1.1 Regulatory Setting

Federal

Clean Water Act

Section 304 of the Clean Water Act establishes primary drinking water standards and requires states to ensure that potable water retailed to the public meets these standards. State primary and secondary drinking water standards are promulgated in California Code of Regulations Title 22, Sections 64431–64501. Secondary drinking water standards incorporate nonhealth risk factors including taste, odor, and appearance. The National Pollutant Discharge Elimination System (NPDES) regulates the discharge of drainage to surface waters. Federal NPDES regulations are administered by the State Water Resources Control Board (State Water Board) and through the Regional Water Resources Control Boards (Regional Water Boards). Because the project area drains to the Central Valley and to San Francisco Bay, it is under the jurisdiction of both the Central Valley Water Board and the San Francisco Bay Regional Water Board.

Municipal storm drainage is required to meet board standards under waste discharge regulations and NPDES permits.

State

Porter-Cologne Water Quality Control Act (Section 13000 et seq.)

The Porter-Cologne Water Quality Control Act directs the State Water Board and Regional Water Boards to prepare water quality control plans (basin plans) that establish water quality objectives and beneficial uses for each body of water, including groundwater basins, within the regional boundaries. The Porter-Cologne Act empowers the State Water Board and Regional Water Boards to protect the beneficial use of California waters, thereby providing broader authority than offered by the Clean Water Act alone. The State Water Board and Regional Water Boards adopt regulations to protect surface water quality.

California Energy Commission

The California Energy Commission (CEC) regulates the provision of natural gas and electricity within the state. The CEC is the state's primary energy policy and planning agency and has five major responsibilities: forecasting future energy needs and keeping historical energy data, licensing thermal power plants 50 megawatts or larger, promoting energy efficiency through appliance and building standards, developing energy technologies and supporting renewable energy, and planning for and directing the state response to energy emergencies.

California Integrated Waste Management Board

The California Integrated Waste Management Board is the state agency designated to oversee, manage, and track California's 76.5 million tons of waste generated each year. It is one of the six agencies under the umbrella of the California Environmental Protection Agency. The California Integrated Waste Management Board develops laws and regulations to control and manage waste; enforcement authority is typically delegated to the local government. The board works jointly with local government to implement regulations and fund programs.

Pursuant to the California Integrated Solid Waste Management Act of 1989, all cities in California are required to reduce the amount of solid waste disposed in landfills. Contracts that include work that will generate solid waste, including construction and demolition debris, have been targeted for participation in source-reduction, reuse, and recycling programs. Contractors are urged to manage solid waste to divert waste away from disposal in landfills (particularly Class III landfills) and to maximize source reduction, reuse, and recycling of construction and demolition debris.

Department of Water Resources

In June 1991, California Department of Water Resources (DWR) published Bulletin 74-90 as a supplement to Bulletin 74-81, Water Well Standards: State of California, December 1981. Together, the two bulletins form the complete minimum Well Standards for the construction, maintenance, abandonment and destruction of water wells, monitoring wells and cathodic protection wells. DWR requires that wells be in good working order with adequate protection measures in place to protect persons/animals if the intent is to use the well in the future. If the well is not to be used, DWR requires the well be abandoned one year after last use of the well.

Wastewater

In the project area, wastewater is regulated by the agencies listed below.

- State Water Board.
- San Francisco Bay Regional Water Board.
- California Department of Pesticide Regulation.
- California Department of Toxic Substances.

Local

The Alameda County Public Works Agency, (ACPWA) Water Resources Section is responsible for all well permitting activities for nine cities and unincorporated western Alameda County and manages all drilling permit applications within its jurisdiction, The ACPWA is the administering agency of County General Ordinance Code, Chapter 6.88. The purpose of the code is to prevent pollution or contamination of groundwater such that water obtained from water wells will be suitable for the beneficial uses intended and shall not jeopardize the health, safety, or welfare of the people of the county. The County also regulates the destruction of abandoned wells or wells found to be public nuisances. The provisions of these laws are administered and enforced by ACPWA through its Well Standards Program.

3.18.1.2 Environmental Setting

Water Service

The Alameda County Water District provides water service to the cities of Fremont, Union City, and Newark. Rural residences in eastern unincorporated Alameda County obtain water from private wells. No water service is provided at the existing windfarms.

Wastewater

No sewer or septic systems are present or proposed at the project site.

Stormwater Drainage

The project site is located entirely in a rural setting; stormwater runoff drains primarily through sheet flow along the sides of roads, natural drainage swales, ditches, and watercourses.

Solid Waste Disposal

Two permitted, large-volume landfills are active in Alameda County: Vasco Road Landfill and the Altamont Landfill. The Vasco Road Landfill is located at 4001 North Vasco Road in Livermore. The facility accepts a variety of materials including nonhazardous industrial waste including nonfriable asbestos, contaminated soil, municipal wastewater treatment plant sludge, construction and demolition wastes, empty containers, and other industrial and special wastes (Contra Costa County n.d.). Vasco Road Landfill is estimated to have disposal capacity through 2022 (East Bay Times 2005).

The Altamont Landfill is located at 10840 Altamont Pass Road in Livermore and has disposal capacity through 2045 (Waste Management 2020). It accepts for disposal all nonhazardous municipal solid wastes, nonhazardous industrial and special wastes, dewatered wastewater treatment plant sludge (biosolids), treated auto shredder wastes, construction and demolition debris, and liquids for solidification (Waste Management 2014).

3.18.2 Environmental Impacts

3.18.2.1 Methods for Analysis

Identifying the impacts of the project on utilities and service systems involved a review of project information and applicable regulations.

3.18.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.
- Have sufficient water supply to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.

- A determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Generation of solid waste in exceedance of state or local standards or in excess of the capacity of local infrastructure, or other impediment to the attainment of solid waste reduction goals.
- Failure to comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

3.18.2.3 Impacts and Mitigation Measures

Impact UT-1: Relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects (less than significant)

The project would entail the installation of up to 36 new wind turbines on 29 privately-owned parcels. The 518 old generation turbines and towers, along with the turbine foundations, were decommissioned and removed from the project site in 2016.

The construction and operation of the project would not substantially modify the existing stormwater drainage patterns at the project site. The project would include a small increase in impervious surfaces (approximately 2.8 acres of the 4,600-acre project site) for tower, turbine, and substation foundations, but this constitutes less than 1 percent of the project site and would not alter existing stormwater drainage patterns. The existing onsite drainage patterns would be maintained, with sheet flow along the side of the roads. Where roads would be widened or where other grading work would take place, existing culverts would be inspected and replaced or reinforced if necessary. As the project would disturb more than 1 acre, it would require coverage under the state's Construction General Permit. Coverage under this permit requires developing and complying with a SWPPP, which would include BMPs and recommendations which would prevent environmental effects related to stormwater drainage. Consequently, impacts related to construction of new stormwater drainage facilities or expansion of existing facilities would be less than significant.

No stormwater drainage facilities are proposed as part of the project. Because the project would disturb more than 1 acre, it would require coverage under the state's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2010-0014-DWQ) (Construction General Permit). Consequently, a stormwater pollution prevention plan (SWPPP) would be prepared. The SWPPP would include erosion control best management practices. See Section 3.10, *Hydrology and Water Quality*, for further discussion of drainage in the project site.

Construction of the project would not generate a significant amount of wastewater. Water for construction activities would be provided through an agreement with municipal or private suppliers. Temporary onsite water tanks and water trucks would provide water for fire water support, dust suppression, and construction needs. Drinking water and water for sanitation facilities would be trucked into the project site. During construction, a local sanitation company would provide and maintain appropriate sanitation facilities (i.e., portable toilets). If necessary, additional temporary facilities would be placed at specific construction locations. This impact would be less than significant, and no mitigation is required.

Operation of the project would not generate a significant amount of wastewater. Windpower turbines do not consume water or produce wastewater during operations and no additional permanent wastewater-producing structures such as restrooms are included in the project. This impact would be less than significant, and no mitigation is required.

The project would produce electric power through the use of wind turbines to help meet the state's Renewables Portfolio Standard. No new natural gas or telecommunication facilities would be required for the project.

As the project would not require the relocation, construction, or expansion of water, wastewater treatment, or stormwater drainage facilities, and no natural gas or telecommunication facilities are required, the project would have less than significant impact and no mitigation is required.

Impact UT-2: Have sufficient water supply to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years (less than significant)

Water quantities used for construction and operation of the project are described below in Table 3.18-1.

Table 3.18-1. Water Usage Estimates for Construction and Operations of the Project

Water Use Estimate for Construction Period	
Earthwork Compaction	16,650,000 gal
Dust Control	14,400,000 gal
Concrete	487,000 gal
Revegetation	14,357,000 gal
15% Other & Contingency	6,881,000 gal
Total (Construction)	**52,755,000 gal (161.9 acre-feet)**
Water Use Estimate for Operations Period	
Site Maintenance Work	170,000 gal
Dust Control	140,000 gal
Revegetation	140,000 gal
15% Other & Contingency	110,000 gal
Total (Per Year Operations)	**560,000 gal (1.7 acre-feet)**

Saidov, Robin. Personal Communication. Email correspondences to Heidi Mekkelson et al. RE: Mulqueeney wind water use estimates. Received September 25, 2020.

As shown above in Table 3,18-1, construction of the project would require approximately 52,755,000 gallons (162 acre-feet) of water for earthwork compaction, dust control, concrete, revegetation, as well as other miscellaneous uses. This accounts for approximately 0.25 percent of the water demand forecasted for 2020 in the County's *Urban Water Management Plan 2015 – 2020* (63,400 acre-feet per year) (Alameda County Water District 2016). Daily water use would vary, depending on the weather conditions and time of year. Temporary onsite water tanks and water trucks would be made available for fire water support, dust suppression, and other construction needs. A minimal amount of water would be required for construction worker needs (e.g., drinking water, sanitation facilities). This water would be trucked in or delivered as bottled drinking water. A local sanitation company would provide and maintain appropriate construction sanitation facilities. As discussed in Section 3.10, *Hydrology and Water Quality*, due to the minimal water requirements of the project, there would be adequate water supply available to meet the needs of the project and would not decrease groundwater supplies. In addition, compliance with the ACPWA's Well Standards Program and Chapter 6.88 of the County General Ordinance Code would ensure impacts relating to water supply would be less than significant.

As shown above in Table 3.18-1, the operation of the project is estimated to use approximately 560,000 gals (approximately 1.7 acre-feet) of water per year. This accounts for approximately 0.002 percent of the County's projected water demand in 2020 (63,400 acre-feet per year) (Alameda County Water District 2016). In general, wind power uses very little water and water consumption savings in California from wind power projects amount to more than 3.4 billion gallons per year (CalWEA 2020). The Alameda County Water District reports that industrial uses account for approximately 3,300 acre-feet per year of water provided by the district (ACWD 2020a). The project could use up to 1.7 acre-feet of water per year, which represents approximately 0.5 percent of the water the district estimates for industrial uses. The average single-family home in Alameda County uses approximately 200 gallons of water per day, or 73,000 gallons of water a year (ACWD 2020b.). Therefore, the project site would use the yearly water equivalent of approximately 8 single-family homes. Based on the project's minimal estimated water demand compared with the supplies available, it is not anticipated that the project would require new or expanded entitlements during normal, dry, or multiple dry years. This impact would be less than significant. No mitigation is required.

Impact UT-3: Project-related exceedance of existing wastewater treatment capacity (no impact)

The project would not generate a significant amount of wastewater. No sewer or septic systems are present or proposed at the project site, and portable toilets would be provided during construction. The operation of the windpower turbines would not produce any wastewater and no wastewater producing structures such as restrooms are included in the project. No Operations and Maintenance (O&M) facility would be constructed at the project site as part of the project. O&M staff would use restroom facilities at existing commercial building space leased for O&M uses in nearby Tracy or Livermore.

Therefore, the project would not impact any wastewater treatment facilities' capacity. There would be no impact. No mitigation is required.

Impact UT-4: Project-related exceedance of state or local solid waste standards or of the capacity of local infrastructure, or other impediments to attaining solid waste reduction goals (less than significant)

The majority of solid waste generated by the project would occur during construction activities. Excess rock generated by foundation construction would be spread on existing roads and maintenance areas surrounding the turbines. Trenches excavated for power collection system and communication line installation would be partially backfilled with remaining subsurface soil, compacted, and covered with topsoil. The material from old turbine foundations may be reused for road base or hauled offsite to the Altamont Landfill, subject to the County's Green Building Ordinance, which mandates a reduction in the amount of solid waste offloaded to landfills. Any debris would be properly disposed offsite consistent with local, state, and federal restoration requirements as described in a Reclamation/Restoration Plan, which would be developed prior to construction as part of the construction planning and permitting process. The 518 old generation turbines and towers were decommissioned and removed from the project site in 2016 and their removal and disposal is not part of the project. As the project would recycle solid waste onsite and conform to the County's Green Building Ordinance, it is not anticipated that the project would generate enough solid waste to affect the capacity of any landfill. This impact would be less than significant. No mitigation is required.

Impact UT-5: Inconsistency with federal, state, and local management and reduction statutes and regulations related to solid waste (no impact)

As indicated above, the majority of solid waste (excess rock and trenched material) generated by the project would be recycled on site and any material hauled offsite would be subject to the County's Green Building Ordinance. The project would be required to comply with local, state, and federal solid waste regulations. There would be no impact and no mitigation is required.

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3.19 Wildfire

This section describes the environmental and regulatory setting for wildfire in the project site. As described in Chapter 2, *Project Description*, the project site is located in the southeastern quadrant of the Alameda County portion of the Altamont Pass area, north and south of Patterson Pass Road.

3.19.1 Existing Conditions

Federal

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 provides the legal basis for the Federal Emergency Management Agency's (FEMA) mitigation planning requirements for state, local, and tribal governments as a precursor to mitigation grant assistance. The Disaster Mitigation Act of 2000 requires that local governments prepare a Local Hazard Mitigation Plan that must be reviewed by the State Mitigation Officer, approved by FEMA, and renewed every 5 years. The plan must include a planning process, a risk assessment, a mitigation strategy, and plan maintenance and updating procedures to identify the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government. Natural hazards include earthquakes, tsunamis, tornadoes, hurricanes, flooding, and wildfires.

State of California

Senate Bill 1241 (Statutes of 2012, Kehoe)

Senate Bill 1241 revised the safety element requirements for State Responsibility Areas (SRAs) and very high fire hazard severity zones. The bill requires that any revisions of general plans' housing element after January 2014 must also include the revision and updating of the safety element, as necessary, to address the risk of fire in SRAs and very high fire hazard severity zones.

Public Resources Code Section 4291

Section 4291 of the California Public Resources Code defines and describes fire protection measures and responsibilities for mountainous, forest, brush, and grass-covered lands. These measures include, but are not limited to, the following.

- Maintenance of defensible space of 100 feet from each side and from the front or rear of a structure, but not beyond the property line.
- Removal of a portion of a tree that extends within 10 feet of the outlet of a chimney or stovepipe.
- Maintenance of a tree, shrub, or other plant adjacent to or overhanging a building free of dead or dying wood.
- Construction or rebuilding of a structure must comply with all applicable state and local building standards.

State Responsibility Areas Public Resources Code 4102

SRAs are defined by California Public Resources Code Section 4102 as areas of the state in which the State Board of Forestry and Fire Protection has determined that the financial responsibility for preventing and suppressing fires lies with the State of California. SRAs are lands in California where the California Department of Forestry and Fire Protection (CalFire) has legal and financial responsibility for wildfire protection. SRA lands typically are unincorporated areas of a county, are not federally owned, have wildland vegetation cover, have housing densities lower than three units per acre, and have watershed or range/forage value. Where SRAs contain built environment or development, the local government agency assumes responsibility for fire protection.

LRAs include lands that do not meet criteria for SRAs or federal responsibility areas, or are lands in cities, cultivated agricultural lands, and nonflammable areas in the unincorporated parts of a county. LRAs can include flammable vegetation and wildland-urban interface areas. LRA fire protection is provided by the local fire departments, fire protection districts, county fire departments, or by contract with CalFire.

Very High Fire Hazard Severity Zones Government Code 51177

Very High Fire Hazard Severity Zones are defined by Government Code Section 51177 as areas designated by the Director of Forestry and Fire Protection as having the highest possibility of having wildfires. These zones are based on consistent statewide criteria and the severity of fire hazard that is expected to prevail in those areas. The zones are also based on fuel loading, slope, fire weather, and other factors, such as wind, that have been identified by the Department of Forestry and Fire Protection as a major cause of the spreading of wildfires. Fire Hazard Severity Zone maps are produced and maintained for each county.

2019 California Strategic Fire Plan

The Board of Forestry and Fire Protection’s Strategic Fire Plan provides an overall vision for a built and natural environment that is more fire resilient through the coordination and partnerships of local, state, federal, tribal, and private entities. First developed in the 1930s, the Strategic Fire Plan is periodically updated; the current plan was prepared in 2019. The Plan analyzes and addresses the effects of climate change, overly dense forests, prolonged drought, tree mortality, and increased severity of wildland fires through goals and strategies. The primary goals of the 2019 Strategic Fire Plan are to do the following.

- Improve core capabilities by: establishing a 30-year investment plan to maintain right-sized Department staffing and resource deployment for mission delivery; increasing fire prevention measures through education and actions; improving statistical and geographic data collection methods and efforts to document successes and deficiencies; improving the sharing of historical records for lessons learned and formalize a culture of collectively learning from past experiences; increasing by 20% the acreage of projects implemented under the California Forest Improvement Program; implementing fuels reduction projects on at least 50,000 acres annually; and, continuing to work with the Stewardship Council, conservation easement holder designees, other collaborators, and stakeholders to complete the successful donation and transfer of designated watershed lands to CALFIRE for management as Demonstration State Forests.
- Enhance internal operations by: reducing overlaps and streamline business support processes; improving timeliness and frequency of communications; advancing investments for technology innovation in the field; and, increasing funding to keep pace with wildfire risks.

- Ensure health and safety by: increasing behavioral health opportunities for all employees; investing in science based methods to reduce stress, exposure, and increase physical fitness; expanding health and wellness education and information platforms; increasing investments in research; improving safety awareness education and training; reducing accidents; and, reducing worker's compensation cases and costs.
- Build an engaged, motivated, innovative workforce by: identifying kill gaps and target recruitment; minimizing the number of vacant positions through targeted recruiting; expanding the use of employee development tools; improving training opportunities for ease of access and use; and, improving employee retention rates by 10% in the next 5 years.

Local

Alameda County General Plan

The *Safety Element of the Alameda County General Plan* (Alameda County 2013) contains goals, policies, and actions the County might take related to nonnatural hazards and fire hazards. Many of the principles and actions refer to new development. Those relating to the project as an existing facility are excerpted below.

> **Goal 2. To reduce the risk of urban and wildland fire hazards.**
>
> **P3.** Development should generally be discouraged in areas of high wildland fire hazard where vegetation management programs, including the creation and maintenance of fuel breaks to separate urban uses would result in unacceptable impacts on open space, scenic and ecological conditions.

East County Area Plan

The Environmental Health and Safety Elements of the ECAP contain two programs related to wildland fire hazards (Alameda County 2000).

Environmental Health and Safety

> **Program 117:** The County shall work with the California Department of Forestry and Fire Protection to designate "very high fire hazard severity zones" in conformance with AB 337 (1992). The County shall ensure that all zones designated as such meet the standards and requirements contained in this legislation.
>
> **Program 118:** The County shall prepare a comprehensive wildland fire prevention program including fuelbreaks, brush management, controlled burning, and access for fire suppression equipment.

Altamont Pass Windfarms Fire Requirements

The *Altamont Pass Windfarms Fire Requirements* were adopted by the County of Alameda on September 22, 2005 and provide conditions which would facilitate a reasonable level of fire safety for the operations of wind turbines, related equipment, and associated activities in fire hazardous areas. Applicable conditions are excerpted below.

Buildings and Structures

> **A. Clearances.** All buildings and structures which are owned, leased, operated, maintained or under control which are upon or adjoining hazardous fire areas shall be maintained with an effective firebreak by removing and clearing away flammable vegetation and combustible growth from within 30 feet of such buildings or structures.

Wind Turbines

A. New Windtowers. Newly constructed windtowers which are not totally enclosed shall be provided with a yaw damper or other approved method which will prevent the over-twisting of pendent cables**.**

B. Clearances. Vegetation clearances around wind turbines and their associated electrical component such as panel boxes and transformers may be required by CDF or the Alameda County Fire Department when clearances are determined necessary by the fire agency because of actual or potential fire risk associated with the equipment. Such clearances shall be adequate to mitigate the risk which necessitate the clearances**.**

Water Supplies

A. Water Storage. Year-round water supplies of not less than 5,000 gallons capacity shall be provided for firefighting purposes in strategic locations within the site. Such locations shall be noted on the road map plan. The number and location of such water supplies shall be determined in cooperation with the landowners, CDF, ACFD, and windfarm company.

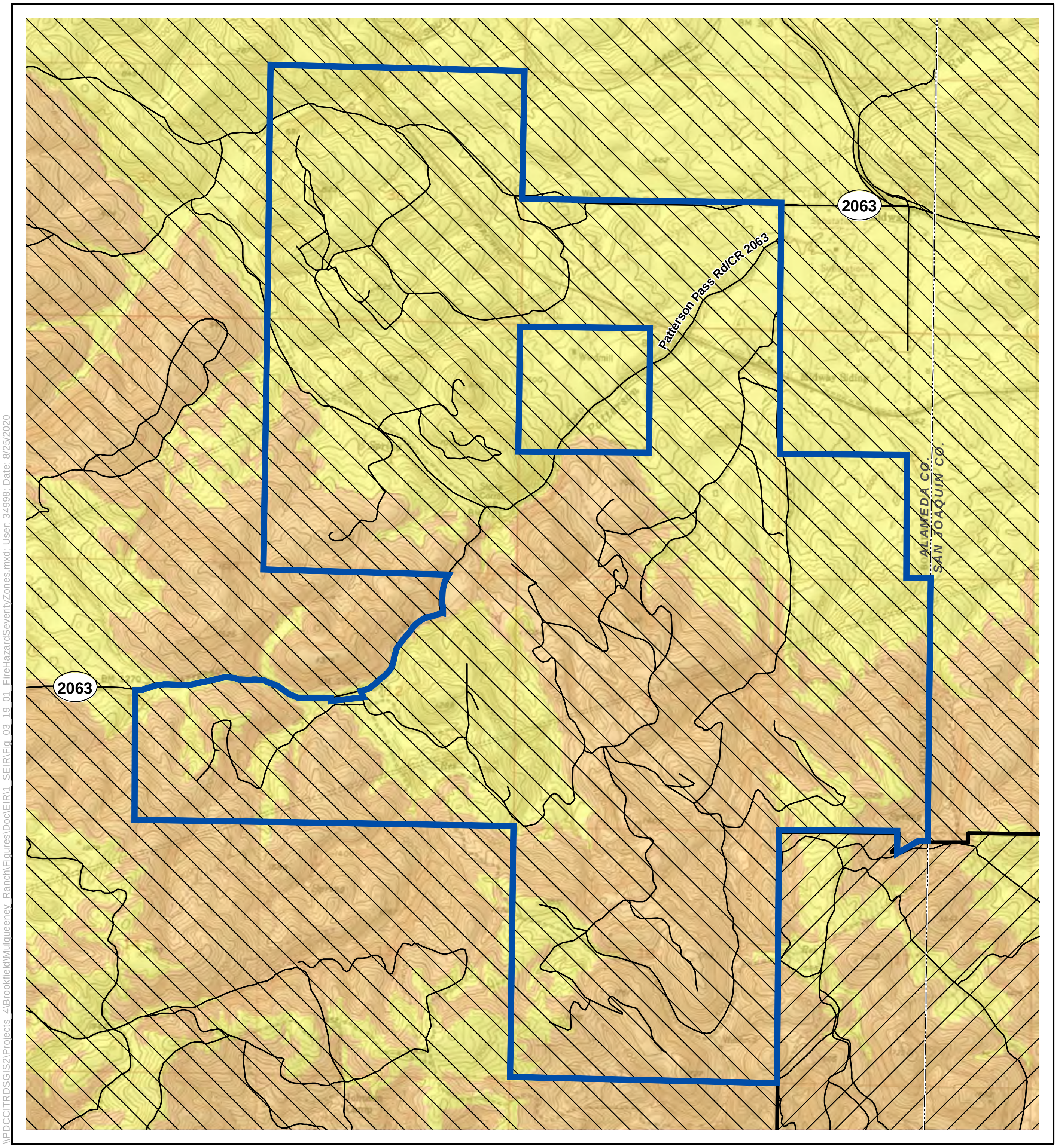
3.19.1.2 Environmental Setting

The project site comprises 29 privately-owned parcels within the Altamont Pass Wind Resource Area (APWRA). As shown in Figure 3.19-1, the project site is located in an SRA and encompasses an area which includes moderate to high fire hazard severity zones (California State Geoportal 2020). The project site is served by CalFire and the Alameda County Fire Department

The environmental setting for wildfire describes the existing conditions within these parcels as they relate to wildfire hazard. California Government Code Section 51177 defines a "wildfire" as an "unplanned, unwanted wildland fire, including unauthorized human-caused fire, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to extinguish the fire." A wildfire's characteristics depend on the circumstances where the fire is burning. Brush fires, which burn both natural vegetation and dry-farmed grain, typically burn fast and very hot, and often threaten homes in the area and lead to serious destruction of vegetation. Woodland fires are relatively cool under natural conditions; however, if a brush fire spreads to a woodland, it could generate a destructive hot crown fire. Currently, no suitable management technique of reasonable cost has been devised to reduce the risk of these fires. However, these fires can typically be controlled relatively quickly and easily if they are reachable by fire equipment.

Short-term effects of wildfires include destruction of timber, and loss of wildlife habitat, scenic vistas, and watersheds. Long-term effects of wildfires include smaller timber harvests, reduced access to recreational areas, and destruction of community infrastructure and cultural or economic resources. Wildfires also increase an area's vulnerability to flooding. Wildfire damage to life and property is generally greatest in areas designated as wildland-urban interface, where development is in proximity to densely vegetated areas.

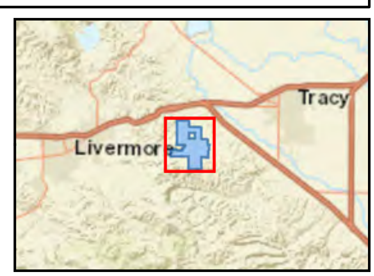
Additionally, climate change is expected to contribute to significant changes in fire regimes. Fire is a natural component of many ecosystems and natural community types, including grasslands, chaparral/scrub, and oak woodland. For each of these natural communities, fire frequency and intensity influence community regeneration, composition, and extent. Wildfire frequency, size, and intensity are expected to increase over time throughout the inventory area. The number of wildfires is projected to increase by 51 percent, while total area burned by contained fires is projected to increase 41 percent despite enhancement of fire suppression efforts (California Department of Fish and Wildlife 2015).



Project Boundary
County Boundary
Local Road
Parcel Boundary

Fire Hazard Severity Zones
High
Moderate

Responsibility Areas for Fire Protection
Federal Responsibility Area (FRA)
State Responsibility Area (SRA)



Source: CAL FIRE 2020

N

0 2,000 4,000 Feet
1:36,000

Figure 3.19-1
Fire Hazard Severity Zones in the Project Area

Fire hazards pose a considerable risk to vegetation and wildlife habitats throughout the APWRA. The project site consists primarily of grassland and grazing land. Dry climate conditions create circumstances rich with fuels, although active grazing, agricultural irrigation, and landscape irrigation provides some fuel reduction. Human activities are the primary reason wildfires start, although lightning strikes do occasionally occur.

3.19.2 Environmental Impacts

Five general categories of fire origin are associated with wind generators: hardware and conductor failures of power collection lines, dropping of collection lines, turbine malfunction or mechanical failure, construction-related accidents, and avian related incidents.

Wildfires related to power collection lines and malfunction or mechanical failure of turbines can result from turbine overload, bearing overheating, or pendant cable failure; such incidents occur primarily on older units. (A pendant cable is a collection of low-voltage and communication cables, which drop through the top of the turbine support structure and connect to a weather head or junction box at a lower level on the tower.) If not properly maintained, these cables may twist and bind or rub and cause an electrical short, emitting sparks or flames. On unenclosed towers the sparks can escape the structure more easily. Avian-related incidents (i.e., electrocuted birds) involving birds catching fire and falling to the ground have also been a source of wind generator–related fires in the APWRA.

3.19.2.1 Methods for Analysis

This section describes the methods for analyzing the impacts of implementing the project. Criteria from Appendix G of the State CEQA Guidelines were used to determine whether the project would have a significant impact related to wildfire. Impacts related to wildfire were assessed based on consultation with the County's planning staff, and review of applicable documents such as the *Alameda County General Plan* (Alameda County 2013).

3.19.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Substantial impairment of an adopted emergency response plan or emergency evacuation plan.
- As a result of slope, prevailing winds, or other factors, the exacerbation of risks of and exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Installation or maintenance of project-associated infrastructure (e.g., 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 on the environment.
- Exposure of people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, post-fire slope instability, or drainage changes.

3.19.2.3 Impacts and Mitigation Measures

Impact WF-1: Substantial impairment of an adopted emergency response plan or emergency evacuation plan (less than significant with mitigation)

The project would install of up to 36 new wind turbines on the project site, which was previously used for wind production. The 518 old generation turbines and towers, along with the turbine foundations, that were previously located on the project site were decommissioned and removed in 2016. The project site currently supports cattle-grazing. The project would reintroduce windpower uses to the project site, which would require operations and maintenance (O&M) staff to access the project site for routine and non-routine maintenance such as repair or replacement of rotors or other major components when necessary. Operations of the project would therefore result in a small routine increase of traffic associated with O&M, which would not interfere with an adopted emergency response plan or emergency evacuation plan.

The project would install new fourth-generation turbine towers and blades which would require large trucks and cranes for installation. These construction and delivery vehicles may require temporary road and lane closures to safely operate. Therefore, construction of the project could result in delay or obstruction of roadways necessary for emergency evacuation and emergency response vehicles.

The project would be required to comply with PEIR Mitigation Measure TRA-1, which would require the development and implementation of a Construction Traffic Plan. The plan would define hours, routes, and safety and management requirements, as well as incorporate measures such as informational signs, traffic cones, and flashing lights to identify any necessary changes in temporary roadway configurations. The Construction Traffic Plan would be prepared by the project engineers in coordination with Alameda County and other related agencies and would ensure adequate emergency route access at all times. All required permits from the County and/or Caltrans would be acquired before the construction of the project. With the implementation of PEIR Mitigation Measure TRA-1, impacts to emergency response and evacuation plans would be reduced to a less-than-significant level.

PEIR Mitigation Measure TRA-1: Develop and implement a construction traffic control plan

Impact WF-2: Exacerbation of wildfire risks associated with pollutant concentrations or uncontrolled spread of wildfire (less than significant)

The project site is located in an SRA and encompasses an area which includes moderate to high fire hazard severity zones (California State Geoportal 2020). The project would install of up to 36 new wind turbines on the project site, potentially increasing the risk of wildfires ignited by wind generators. The project would install fourth-generation turbines, which have improved upon older models in terms of fire ignition risk and are anticipated to result in a reduction of potential fire ignitions. The most likely source of an ignition from the project would be hardware or conductor failures of power collection lines, dropping of collection lines, turbine malfunction or mechanical failure, and avian-related incidents. In addition, during construction, additional work crews would be required, temporarily increasing the number of vehicles at the project site. Climate conditions together with the potential for vehicle-related ignitions increase the potential for ignition, especially during the summer and fall months.

Construction on project site would be a temporary activity, and onsite water tanks would be made available for fire suppression needs during construction. OSHA requirements would be followed regarding the safe control and storage of combustible materials. Therefore, construction of the project would not exacerbate wildfire risks associated with pollutant concentration or uncontrolled spread of wildfire and impacts would be less than significant.

As discussed above, wind generators can pose a risk regarding wildfire resulting from hardware and conductor failures, the dropping of collection lines, turbine malfunction or failure, avian related incidents, and accidents related to construction. However, as discussed in Chapter 2, *Project Description*, under Operational Safety and Environmental Compliance Programs, the proposed turbines would be equipped with internal protective control mechanisms which would safely shut them down during a high-voltage grid outage or fire-related turbine failure. Collector substations would also be fenced and locked and would include visible safety signage. In addition, the project would be subject to County requirements for fire prevention as outlined in the County's *Altamont Pass Wind Farm Fire Requirements*. As such, the project would be required to maintain firebreaks and clearances around electrical lines, and provide year-round water supplies for firefighting.

The PEIR concluded that the fire-related impact of individual repowering projects would be less than significant, and no mitigation is required (refer to Impact HAZ-8a-2 in the PEIR). The project would comply with the *Altamont Pass Wind Farms Fire Requirements* as described in Exhibit C of the 2005 Conditional Use Permits. Consequently, the potential for exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires is less than significant, and no mitigation is required.

Impact WF-3: Project-related installation or maintenance of associated infrastructure that may exacerbate fire risk or result in temporary or ongoing environmental impacts (less than significant)

As discussed above Impact WF-2, implementation of the project would carry with it a potential for fire ignition risks (e.g., turbine overload, bearing overheating, pendant cable failure; avian-related incidents). However, employing standard measures to reduce fire risks during construction (onsite water tanks for fire suppressions, etc.), proper control and storage of combustible materials, and standard O&M procedures as described during operation and maintenance, fire risks would be reduced.

The PEIR concluded that the fire-related impact of individual repowering projects would be less than significant, and no mitigation is required. The project would comply with the *Altamont Pass Wind Farms Fire Requirements* as described in Exhibit C of the 2005 Conditional Use Permits. Consequently, the potential for exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires is less than significant, and no mitigation is required.

Impact WF-4: Exposure of people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, post-fire slope instability, or drainage changes (less than significant with mitigation)

The PEIR concluded that impacts related to flooding, landslides, runoff, and drainage changes would be less-than-significant with implementation of WQ-1: Comply with NPDES requirements. Compliance with NPDES requirements would require erosion control and soil stabilization measures be implemented at the project site. As discussed in more detail in Section 3.7, *Geology, Soils, and Paleontological Resources*, and Section 3.10, *Hydrology and Water Quality*, design requirements to minimize risk of exposure to geologic and hydrologic hazards, including flooding, landslides, runoff, and drainage changes would be required.

As discussed in Section 3.7, *Geology, Soils, and Paleontological Resources*, while the project site is not located in an earthquake-induced landslide hazard zone, the presence of the Neroly Sandstone makes slope instability a concern at the project site. If a wildfire were to take place on these slopes, there could be an increase in risk of landslide or flooding due to post-fire slope instability, which occurs when a wildfire removes the vegetation that holds soils in place, making it more likely for soil to move downslope, especially in tandem with precipitation.

However, as discussed under Impact WF-2, the new generation turbines have improved upon older models in terms of fire ignition risk and are equipped with internal protective control mechanisms which would safely shut them down during a high-voltage grid outage or fire-related turbine failure, greatly reducing the wildfire which could lead to post-fire slope instability. In addition, the risk of wildfire within the project site would be minimized through compliance with all pertinent local, state, and federal policies and codes and project BMPs. Post-wildfire risk also would be reduced with implementation of applicable policies and regulatory requirements.

Consequently, with the implementation of PEIR Mitigation Measure WQ-1, the potential for exposure of people or structures to significant risks related to flooding landslides, or drainage changes is less than significant.

PEIR Mitigation Measure WQ-1: Comply with NPDES requirements

3.19.3 References Cited

Alameda County. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.

California Department of Fish and Wildlife. 2015. *California State Wildlife Action Plan*, *2015 Update: A Conservation Legacy for Californians*. Edited by Armand G. Gonzales and Junko Hoshi, PhD. Prepared with assistance from Ascent Environmental, Inc., Sacramento, CA. Available: https://wildlife.ca.gov/SWAP/Final/Companion-Plans. Accessed: April 25, 2019.

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Chapter 4
Alternatives Analysis

4.1 Alternatives Screening Process

The California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) describe a reasonable range of feasible alternatives to the project, or to the location of the project, that could substantially reduce one or more of the project's significant environmental impacts while meeting most or all of the project's objectives. The EIR is required to analyze the potential environmental impacts of each of the alternatives, although not at the same level of detail as that at which the project is analyzed. There must be sufficient detail to facilitate comparing the respective merits of the alternatives.

Key provisions of the State CEQA Guidelines (Section 15126.6) that pertain to the alternatives analysis are summarized below.

- The discussion of alternatives will focus on alternatives to the project or its location that are feasible, meet most or all of the project objectives, and would substantially reduce one or more of the project's significant effects.
- The range of alternatives must include the no project alternative. The no project analysis will discuss the existing conditions at the time the notice of preparation was published, or if no notice of preparation was published, at the time when environmental analysis is commenced, 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. The no project alternative is not required to be feasible, meet any of the project objectives, or reduce the project's expected impacts to any degree.
- The range of alternatives required in an EIR is governed by a *rule of reason*; therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. An EIR is not required to analyze every conceivable alternative to a project.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained, whose implementation is remote and speculative, or that would not achieve the basic project objectives.

4.1.1 Screening Criteria

A range of potential alternatives was subjected to screening criteria to eliminate those potential alternatives that do not qualify as alternatives under CEQA. The County selected several representative alternatives to consider based on the following criteria.

- Does the alternative meet most, or all, of the project objectives?
- Is the alternative potentially feasible?
- Would the alternative substantially reduce one or more of the significant effects associated with the project?

4.1.2 Project Objectives

The underlying purpose of the Mulqueeney Ranch Wind Repowering Project (project) is to repower a segment of the Program EIR (PEIR) program area with a commercially viable wind energy facility that would help meet the state's Renewables Portfolio Standard (RPS), greenhouse gas (GHG) reduction, and carbon neutrality goals.

The fundamental objective of the proposed project is as follows:

- To ~~site up to 36~~ install new wind turbines that will produce and deliver 80 megawatts (MW) of commercially viable wind energy to the electrical grid through a long-term power purchase agreement with a local community choice aggregator, using up to 36 wind turbines while using the least number of locations to achieve the production objective within the environmental and other regulatory and physical constraints of the project site.

The secondary objectives of the proposed project are as follows:

- To achieve the above fundamental objectives while avoiding and minimizing environmental impacts by:
  - Constructing the turbines and necessary infrastructure with the appropriate use of scientific observation to site turbines to avoid and minimize adverse effects and mortality of native plants, terrestrial species, bats and birds;
  - ~~Improving the understanding by the wind industry, regulators, and the scientific community of the effects of new generation turbines on birds and bats by applying~~ Operating an avian ~~mortality~~ fatality monitoring ~~protocol that is~~ program in accordance with the mitigation measures and survey protocols established in the APWRA Repowering Program EIR and based on the latest science and monitoring results to determine whether applicable thresholds are exceeded, and, if needed, implementing adaptive management measures to reduce fatalities of focal raptor species to levels below the thresholds established in the Program EIR; and
  - Contributing financial and scientific resources to the conservation and enhancement of protected bird and bat species in the Altamont Pass Wind Resource Area (APWRA) region, consistent with mitigation measures identified in the PEIR for repowering the APWRA.
- To increase local short-term and long-term employment opportunities.
- To contribute to repowering of the APWRA and provide economic benefits to Alameda County.

4.1.3 Feasibility

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" (CEQA Guidelines Section 15364). CEQA does not require that an EIR determine the ultimate feasibility of a selected alternative but rather that it is probably feasible.

4.1.4 Significant Impacts

Alternatives to the project are identified for the purpose of avoiding or minimizing the significant impacts of the project. The analysis in this Subsequent EIR (SEIR) concluded that impacts related to the following topics would be significant after implementation of mitigation measures.

4.1.4.1 Biological Resources

- Impact BIO-11: Avian mortality resulting from interaction with wind energy facilities. Implementation of PEIR Mitigation Measure BIO-11a, ~~BIO-11b,~~ BIO-11c, BIO-11d, BIO-11e, BIO-11f, 2020 Updated PEIR Mitigation Measure BIO-11B, BIO-11g, BIO- 11h, and BIO-11i would reduce the rate of avian mortality associated with the project but would not mitigate this impact to a less-than-significant level, as there is no feasible way to avoid the interaction with new wind turbines entirely.
- Impact BIO-14: Turbine-related fatalities of special-status and other bats. Implementation of PEIR Mitigation Measures BIO-14a, 2020 Updated PEIR Mitigation Measure BIO-14b, PEIR Mitigation Measures BIO-14c, BIO-14d, and BIO-14e would reduce the rate of bat mortality associated with the project but will not mitigate this impact to a less-than-significant level, as there is no feasible way to avoid the interaction with new wind turbines entirely.
- Impact BIO-19: Potential impact on the movement of any native resident or migratory wildlife species or established native resident or migratory wildlife corridors, and the use of native wildlife nursery sites. Implementation of PEIR Mitigation Measures BIO-11b, BIO-11c, BIO-11d, BIO-11e, 2020 Updated PEIR Mitigation Measure BIO-11i, PEIR Mitigation Measure BIO-12a, BIO-12b, BIO-14a, and 2020 Updated PEIR Mitigation Measure BIO-14d would reduce this impact, but would not mitigate this impact to a less-than-significant level, as there is no feasible way to avoid the interaction with new wind turbines entirely.

4.1.4.2 Cumulative Impacts

- Air Quality: Construction emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X) for the project would exceed the Bay Area Air Quality Management District (BAAQMD) thresholds after implementation of Mitigation Measures AQ-1 and AQ-2 (Table 3.3-11); accordingly, cumulative construction impacts would be significant and unavoidable. Although construction of the project would generate ROG and NO_X below the BAAQMD threshold (see Impact AQ-2, PEIR Mitigation Measures AQ-2a and AQ-2b, and 2020 NEW Mitigation Measure AQ-2c), the project-generated ROG and NO_X emissions would have a cumulatively considerable contribution to the cumulative impact identified in the PEIR.
- Biological Resources: Operation of the project would result in turbine-related mortality of raptors, other birds, and bats migrating through and wintering within the project site, the program area, and the larger region from which birds and bats migrate to the project site and vicinity. Although mitigation can reduce these impacts, the likelihood of ongoing turbine-related mortality would constitute a significant and unavoidable impact. As with the PEIR, by definition, and considered with other sources of avian mortality (e.g., the Contra Costa County portion of the APWRA and the neighboring Montezuma Hills Wind Resource Area), this would constitute a considerable contribution to a cumulative impact.

4.1.5 Alternatives Subjected to Screening

The following five alternatives are considered and subjected to the screening process described above**,** the No Project – No Repowering Alternative, Micro-Sited Alternative, Reduced Project Alternative, No New Roads Alternative, and 80 MW Solar Alternative. Each of these alternatives are defined in detail below. Of the five alternatives screened, two are eliminated from further consideration for reasons described in detail below under the subheading, "Alternatives Eliminated from Further Analysis."

In addition to the five alternatives considered and subjected to the screening, there are ~~three~~ four potential alternatives that are not subjected to further screening because they are either too speculative ~~and/or,~~ would not reduce project impacts, and/or would be inconsistent with the fundamental objective of the project. These are: (1) Similar/More Turbines Smaller Size Alternative, (2) No Project – Repowering by Others Alternative, ~~and~~ (3) Alternate Site Location Alternative, and (4) Reduced Megawatt Alternative.

1. The **Similar/More Turbines Smaller Size Alternative** proposes a reduced size of wind turbine but at a similar or greater quantity than the project. This alternative is dismissed from screening because it would require an increased disturbance area and would likely result in the same or greater rotor-swept area[1] (RSA), and therefore the same or greater impacts with regard to avian/bat fatalities.
2. The **No Project – Repowering by Others Alternative** assumes the project would not occur as proposed, but that the project site would be repowered in the foreseeable future by one or more wind companies, using turbines described in the PEIR and made subject to the same regulatory regime as other repowering proposals and achieving roughly the same MW production capacity. The ~~lead agency~~ county has determined that this alternative is speculative and therefore is not subjected to screening.
3. The **Alternate Site Location Alternative** ~~propose~~ proposes that up to 36 wind turbines of similar size to the project be located outside of the APWRA. This alternative is dismissed from screening because the project site is within the APWRA, which is already designated for wind energy development and the subject of the PEIR for repowering of the kind generally proposed for the project. No offsite location outside of the APWRA would achieve the objective of repowering the APWRA and providing economic benefits to Alameda County and be reasonably feasible based on the County's General Plan land use designations or wind resource availability. No alternative project location within the APWRA would be expected to avoid or substantially lessen the project's significant impacts, although repowering of the entire APWRA was considered in the PEIR.
4. The **Reduced Megawatt Alternative** proposes a reduced number of similarly sized wind turbines, resulting in a lower overall production capacity. The county has determined that this alternative is inconsistent with the project's fundamental objective to install new wind turbines that will produce and deliver 80 MW of commercially viable wind energy to the electrical grid through a long-term power purchase agreement with a local community choice aggregator. Therefore, this alternative is not subjected to screening.

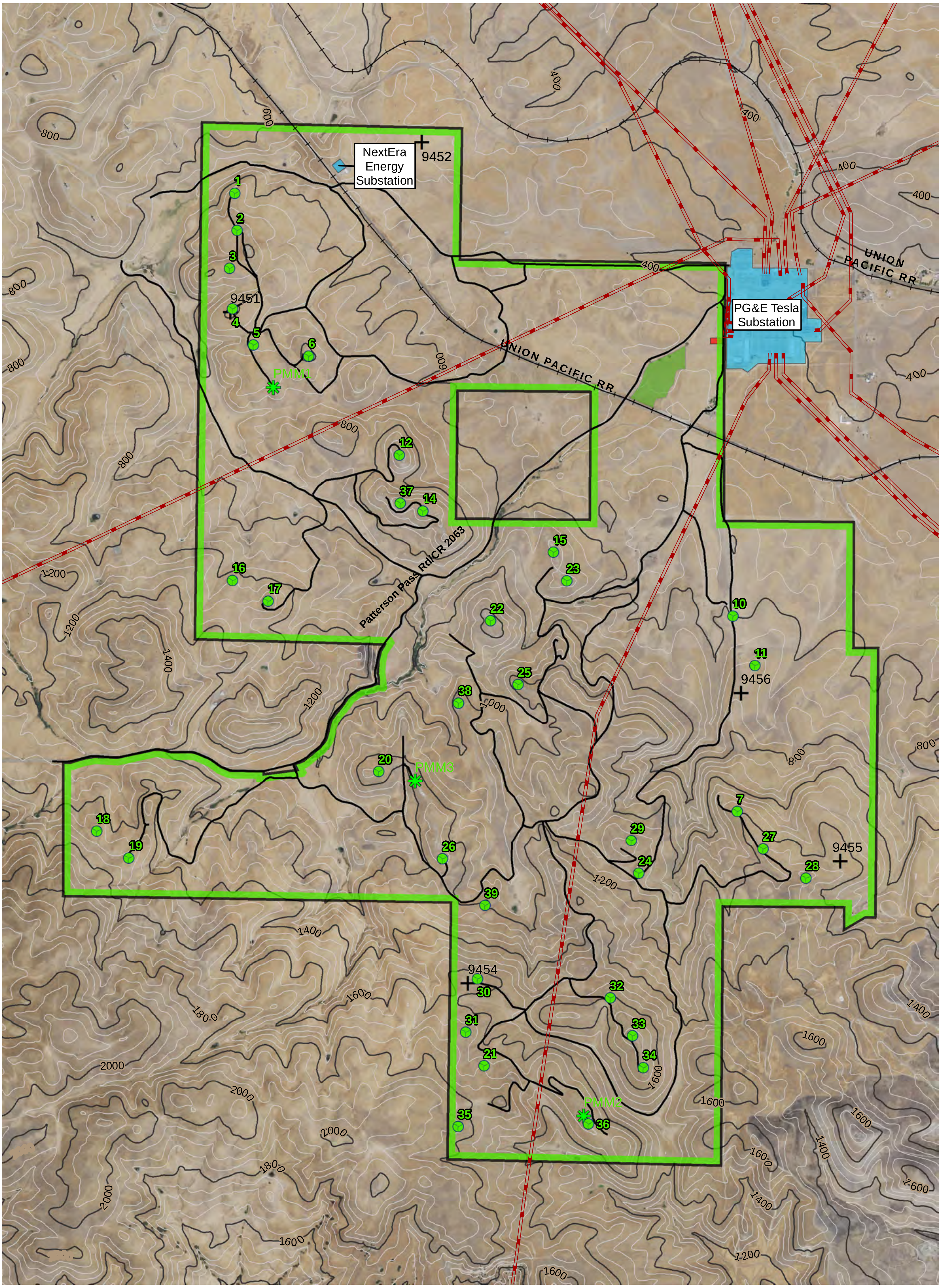
[1] Rotor-swept area (RSA) is the area of the plane within which the wind turbine rotor blades move, calculated as RSA = πr^2 where π is approximately 3.14 and r is the length of the rotor blade in meters. Per Section 3.04, *Biological Resources,* of this SEIR, this updated metric is considered with respect to impacts on avian species. Specifically, this metric considers birds killed per hectare (approximately 2.5 acres) of rotor-swept area (RSA) per year. This metric has the advantage of mechanical plausibility; intuitively, a larger RSA has a greater probability of intercepting a bird in flight. The analysis in the SEIR uses both metrics, fatalities per MW and fatalities per unit RSA, to derive a range of possible fatality rate estimates.

4.1.5.1 No Project – No Repowering Alternative

Under the No Project – No Repowering Alternative, no repowering would occur, and the project site would remain in its existing condition.

4.1.5.2 Micro-Sited Alternative

Under the Micro-Sited Alternative, the applicant would install the same number of turbines as the project, but they would be placed at locations determined through the completed micro-siting study (Appendix F) that was prepared for the project with the objective to reduce avian impacts. Based on this study, this alternative would locate 31 of the project's 36 turbines at different sites to reduce individual turbine bird strike risks, would continue to limit operational capacity to 80 MW, and would maintain the same RSA as the project at 40.7 hectare. The proposed turbine layout under the Micro-Sited Alternative is shown in Figure 4-1.



Alternative Boundary

Alternative Components

Wind Turbine Generator

Proposed MET Mast

Project Substation

Temporary Construction Facility

Existing Infrastructure

Existing Temporary MET Mast (to be removed)

Existing Transmission

Micro-Sited Alternative Conceptual Site Plan, Black & Veatch, October 2020
Contour Interval: 50 feet

0 1,000 2,000 Feet

1:24,000

Figure 4-1
Mulqueeney Ranch Wind Repowering Project
Micro-Sited Alternative Conceptual Site Plan

4.1.5.3 Reduced Project Alternative

The Reduced Project Alternative would: (1) reduce the size of the project in terms of both RSA and the number of turbines; (2) increase turbine distance from eagle nests and eagle activity centers; (3) place turbines in consideration of the results of the micro-siting study (Appendix F) and supplemental micro-siting study (Appendix G); and (4) implement ~~seasonal~~ cut-in speed changes to attempt to reduce impacts on ~~bats~~ golden eagles.

In total, the Reduced Project Alternative would eliminate one-third (12) of the project's 36 turbine sites while retaining an operational capacity of 80 MW,[2] and would reduce the RSA from 40.7 to 32.8 total hectares, a 19% reduction compared to the project. This alternative would also place all turbines at least 0.5 mile from golden eagle nests and eagle activity centers. The number of turbines placed within 1 mile of eagle nests and eagle activity centers would be reduced to 7, compared to 13 turbines for the proposed project. In total, the Reduced Project Alternative would reduce the number of high-risk turbines as defined in the micro-siting studies to 2, compared to 11 under the proposed project. Furthermore, the cut-in speed during ~~the fall migration for bats~~ daylight hours year-round would increase to reduce daylight operational hours by 50% (anticipated to result in a cut-in speed increase to approximately 4.5- 5 meters/second (m/s)~~. This would occur for an eight-week period from August 1 to September 30, from sunset to sunrise)~~ depending on the final turbine model selected) to reduce golden eagle fatality risk. The proposed turbine layout under the Reduced Project Alternative is shown in Figure 4-2.

4.1.5.4 No New Roads Alternative

The No New Roads alternative would construct the same number and location of repowering turbines but would not construct new access roads. In place of providing truck and trailer access to the delivery of turbine components, cranes, and other construction equipment to the new turbine locations for construction, this alternative would require the project applicant utilize helicopters to deliver all turbine components and erect the towers. As a result, no road widening, extensions, or related improvements would be required.

4.1.5.5 80 MW Solar Alternative

The 80 MW Solar Alternative would be a solar array on the Mulqueeney Ranch Repowering site in place of the project's proposed wind turbines. This alternative would result in no RSA and would therefore reduce avian impacts. This alternative would require a site-specific solar engineering plan to identify the specific size and location of the solar arrays necessary to produce 80 MW. As with the project, in order to collect and transfer energy efficiently, this alternative would also require a new substation constructed adjacent to PG&E's Tesla substation where the alternative would connect to the grid.

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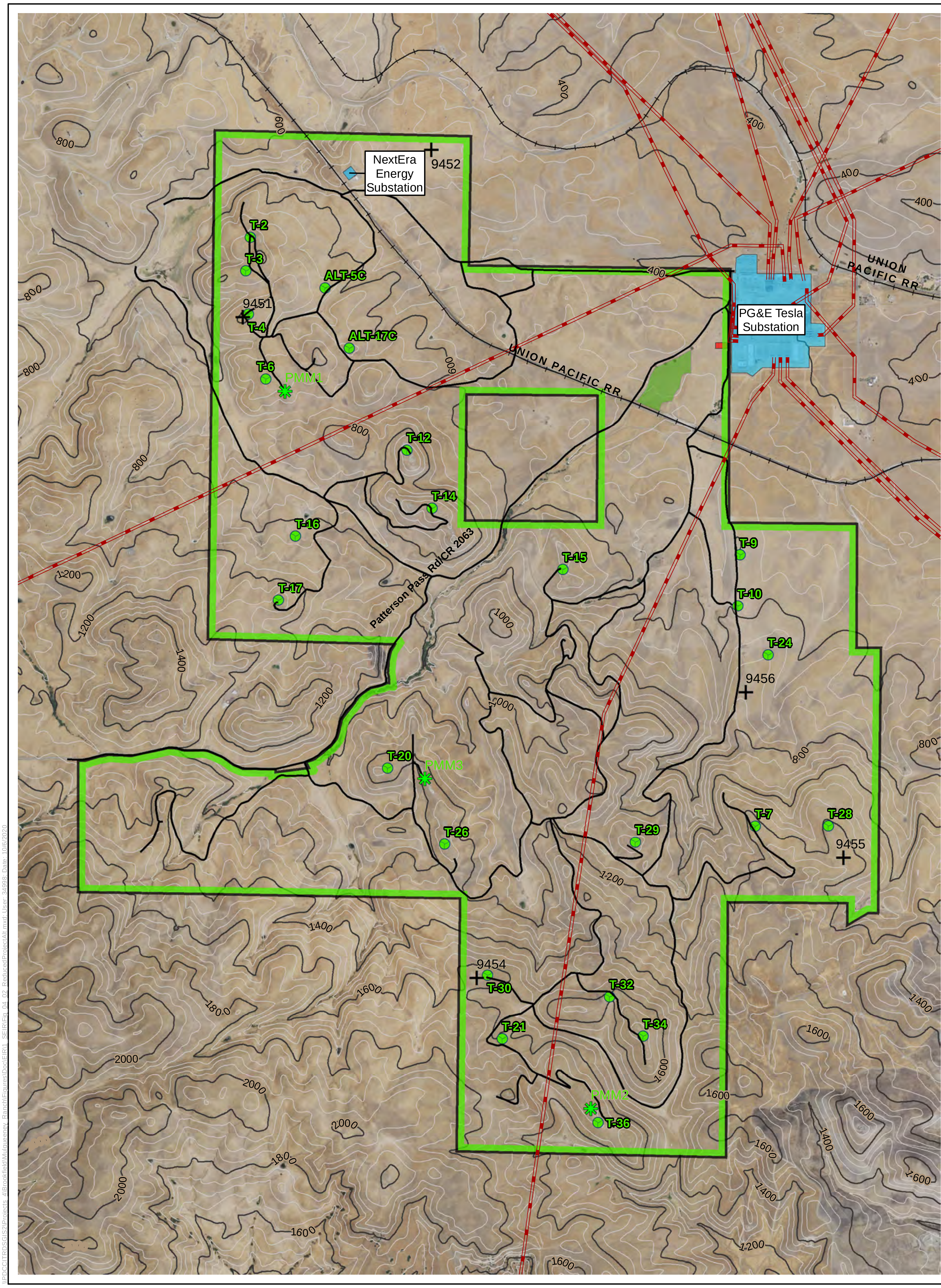
[2] Although the nominal capacity (sum of turbine capacities) would be 83.16 MW under this alternative, operation of the turbines would be electronically limited to a maximum project nameplate capacity of 80 MW.



Alternative Boundary

Alternative Components

- Wind Turbine Generator
- Proposed MET Mast
- Project Substation
- Temporary Construction Facility

Existing Infrastructure

- Existing Temporary MET Mast (to be removed)
- Existing Transmission

Reduced Project Alternative Conceptual Plan, Black & Veatch, October 2020
Contour Interval: 50 feet

N

0 1,000 2,000 Feet

1:24,000

Figure 4-2
Mulqueeney Ranch Wind Repowering Project
Reduced Project Alternative Conceptual Site Plan

4.1.6 Alternatives Eliminated from Further Analysis

4.1.6.1 No New Roads Alternative

As described above, the No New Roads Alternative would construct the same number and location of repowering turbines but would not construct new access roads. Without adequate roads to accommodate trucks required for the construction of the new repowered wind turbines, helicopters would be used to transport large equipment and turbine components to project sites for construction and maintenance. As a result, no road widening, or related improvements would be required.

Without the construction of new roads under this alternative, the extent of ground-disturbing activities would be reduced compared with the activities conducted under the project. This alternative would reduce the amount of additional disturbance caused by access road improvements and widening, an effect which is already less-than-significant after mitigation. However, while this alternative could reduce terrestrial biological impacts related to roadway construction, new helicopter use could result in worsened impacts to avian (biological) resources, aesthetics, noise, and air quality. Helicopters are infrequently used for new project installations throughout the United States due to cost and safety concerns. Extensive helicopter use to support delivery of the turbines would result in substantially higher adverse air quality emissions during construction due to fuel consumption. Receptors and local viewers surrounding the project area would consider the impacts on aesthetics and noise to be greater than under the project because of the use of helicopters. The significant noise levels produced by prolonged use of helicopters could also disturb local fauna and potentially impair behavioral patterns such as breeding, feeding, or sheltering.

Overall, this alternative would not avoid or substantially reduce any significant and unavoidable impacts of the project and thus does not satisfy the third screening criteria. Additionally, this alternative was rejected by the County in its decision on the PEIR as infeasible because it would not with a high degree of certainty avoid or substantially reduce the significant and unavoidable impacts of the program and because it would also result in significant effects that exceed the effects of the program related to aesthetics and air quality. This alternative is thus eliminated from further consideration.

4.1.6.2 80 MW Solar Alternative

The 80 MW Solar Alternative proposes to construct a solar array at the project site in place of the proposed wind turbines. This alternative would result in no acreage of RSA, and would therefore reduce avian and bat fatality impacts. This alternative would require a site-specific solar engineering plan to identify the specific size and location of the solar arrays necessary to produce 80 MW. As with the project, in order to collect and transfer energy efficiently, this alternative would also require a new substation constructed adjacent to PG&E’s Tesla substation where the alternative would connect to the grid. The 80 MW Solar Alternative is dismissed from further analysis because by installing a new 80 MW solar power array, the alternative would fail to meet both primary and secondary project objectives. Further, the project site’s topography does not lend itself to solar development (which typically requires flat land for construction efficiency). This alternative could also have greater aesthetic disturbance effects. In addition, while it would reduce impacts on avian species, it would result in an increase to terrestrial species impacts. Lastly it is rejected because the project site is within the APWRA, which is already designated for wind energy development and the subject of the PEIR for repowering of the kind generally proposed for the project; therefore, it would not be feasible to replace the intended land use with solar arrays.

4.2 Alternatives Analyzed in the EIR

Of the five alternatives identified in Section 4.1.5, *Alternatives Subjected to Screening*, two were eliminated out from further analysis as described above. The following three alternatives were evaluated in comparison to the proposed project in this SEIR.

- No Project – No Repowering Alternative
- Micro-Sited Alternative
- Reduced Project Alternative

In several cases, the severity of the impact may be the same under the alternatives as measured against the CEQA significance thresholds (e.g., both the project and a given alternative would result in a less-than-significant impact). However, the actual magnitude of the impact may be slightly different, providing the basis for a conclusion of greater or lesser impacts. Table 4-1 presents a summary matrix of the project impacts in comparison with the three alternatives.

Table 4-1. Comparison of Project Alternatives to the Project

		Alternative Impacts Compared to the Project		
Environmental Topic Area	Level of Project Impact	No Project – No Repowering	Micro-Sited	Reduced Project
Aesthetics	Less than significant with mitigation	Less	Similar	Less
Agricultural and Forestry Resources	No impact	Similar	Similar	Similar
Air Quality	Less than significant with mitigation	Less	Similar	Less
Biological Resources	Significant and unavoidable	Less	Less	Less
Cultural Resources	Less than significant with mitigation	Less	Similar	Less
Energy	Less than significant with mitigation	Greater	Similar	Less
Geology, Soils, Mineral Resources, and Paleontology	Less than significant with mitigation	Less	Similar	Less
Greenhouse Gas Emissions	Less than significant with mitigation	Greater	Similar	Less
Hazards and Hazardous Materials	Less than significant with mitigation	Less	Similar	Less
Hydrology and Water Quality	Less than significant with mitigation	Less	Similar	Less
Land Use and Planning	No impact	Less	Similar	Similar
Noise	Less than significant with mitigation	Less	Similar	Less
Population and Housing	No impact	Less	Similar	Similar
Public Services	No impact	Less	Similar	Similar
Recreation	No impact	Less	Similar	Similar
Transportation	Less than significant with mitigation	Less	Similar	Less
Tribal Cultural Resources	Less than significant	Less	Similar	Less
Utilities and Service Systems	Less than significant	Less	Similar	Less
Wildfire	Less than significant	Less	Similar	Less

Note: Although the alternatives may result in lesser or greater impacts compared with the project, the difference may be incremental and would not change the significance conclusion or requirement for mitigation.

4.2.1 No Project – No Repowering Alternative

4.2.1.1 Aesthetics

Under the No Project – No Repowering Alternative, the proposed repowering under the project would not occur and the impacts associated with aesthetics would not occur. This alternative would have no impact on aesthetics, and impacts would be less than the project impacts.

4.2.1.2 Agricultural and Forestry Resources

This SEIR identified that there are no important agricultural and forestry resources within the project site, and thus, the project would generate no impact related to agricultural and forestry resources. With no construction at the project site under this alternative, and with no important agricultural and forestry resources, this alternative would generate no impacts on agricultural and forestry, and impacts would be similar to those under the project.

4.2.1.3 Air Quality

With no project construction or operation under this alternative, no repowering would occur on the site and there would be no impacts on air quality. With no air quality impacts, impacts under this alternative would be less than those under the project.

4.2.1.4 Biological Resources

With no new turbines installed under this alternative, there would be no turbine-related avian and bat fatalities and no impacts on other biological resources. Consequently, this alternative would result in no impacts on biological resources, and as such would avoid the project's significant and unavoidable impacts.

4.2.1.5 Cultural Resources

With no project construction or ground-disturbing activity under this alternative, there would be no impacts on cultural resources. Impacts on cultural resources under this alternative would be less than those under the project.

4.2.1.6 Energy

The No Project – No Repowering Alternative would not involve construction, and as such would not directly result in energy consumption. However, unlike the project, the No Project – No Repowering Alternative would not serve state or local plans for renewable energy or energy efficiency. Because the project would install wind turbines that would increase available renewable energy and assist California in meeting its Renewables Portfolio Standard, GHG reduction, and carbon neutrality goals, and the No Project – No Repowering Alternative would not further these goals, the No Project – No Repowering Alternative would result in a greater impact on energy consumption than the project.

4.2.1.7 Geology, Soils, Mineral Resources, and Paleontological Resources

Under this alternative, there would be no ground-disturbing activity associated with project construction staging, turbine instillation, access roads, or a new substation. Therefore, there would be no impacts related to soil erosion and risk of harm to paleontological resources. Like the project, there would be no septic system installed and no mineral resources would be affected. This alternative would generate no impacts on geology, soils, mineral resources, and paleontological resources, and impacts would be less than those under the project.

4.2.1.8 Greenhouse Gas Emissions

Under the No Project – No Repowering Alternative there would be no project construction or operation and therefore no direct or indirect GHG emissions, and no potential to conflict with applicable policies. However, because under this alternative the annual GHG emissions reduction of approximately 26,000 metric tons of carbon dioxide equivalent presented by the project would not occur, this alternative would not help achieve GHG emission reduction goals.

4.2.1.9 Hazards and Hazardous Materials

With no project construction or operation under this alternative, no new ground-disturbing activities would occur. Therefore, there would be no impacts on hazards and hazardous materials, and impacts would be less than those under the project.

4.2.1.10 Hydrology and Water Quality

With no project construction or operation under this alternative, there would be no new ground disturbing activities or impacts on hydrologic systems. Therefore, there would be no impacts on hydrology and water quality, and impacts would be less than those under the project.

4.2.1.11 Land Use and Planning

Under the No Project – No Repowering Alternative, the proposed repowering under the project would not occur and there would be no impacts on land use. Impacts would be less than those under the project.

4.2.1.12 Noise

Under this alternative, there would be no ground-disturbing activity associated with project construction staging, turbine installation, access roads, or a new substation. Therefore, there would be no impacts related to noise and vibration. Accordingly, this alternative would generate no noise-related impacts, and impacts would be less than those under the project.

4.2.1.13 Population and Housing

With no project construction or operation under this alternative, there would be no new service population. Therefore, there would be no impacts on population and housing, and impacts would be less than those under the project.

4.2.1.14 Public Services

With no project construction or operation under this alternative, there would be no new service population. Therefore, there would be no impacts on public services, and impacts would be less than those under the project.

4.2.1.15 Recreation

With no project construction or operation under this alternative, there would be no new service population. Therefore, there would be no impacts on recreation, and impacts would less than those under the project.

4.2.1.16 Transportation and Circulation

Under this alternative, there would be no construction or operational trips associated with project construction staging, turbine instillation, access roads, or a new substation. Therefore, there would be no impacts related to transportation and circulation, and impacts would be less than those of the project.

4.2.1.17 Tribal Cultural Resources

Under this alternative, there would be no ground-disturbing activity associated with project construction staging, turbine instillation, access roads, or a new substation. Therefore, there would be no impacts related to tribal cultural resources. This alternative would generate no impact, and impacts would be less than those under the project.

4.2.1.18 Utilities and Service Systems

With no project construction or operation under this alternative, there would be no new service population. Therefore, there would be no impacts on utilities and service systems, and impacts would be less than those under the project.

4.2.1.19 Wildfire

With no project construction or operation, no impacts would occur under the No Project – No Repowering Alternative, and impacts would be less than those under the project.

4.2.2 Micro-Sited Alternative

4.2.2.1 Aesthetics

The Micro-Sited Alternative would vary slightly from the project in that of the 36 initially proposed turbines, 31 would be located elsewhere within the project site, as shown in Figure 4-1. As with the project, this alternative would develop the project site with turbines. Although the project site is currently undeveloped with wind turbines, the site had turbines at the time the PEIR was published and up until 2016. In addition, the project site is part of the area designated by the County as the wind resource area and was intended to be repowered as is currently proposed, making the development of the site with turbines part of the expected visual conditions. However, construction of the turbines still has the potential to result in a significant impact on scenic resources, to affect scenic resources along a scenic highway, and to alter the existing visual character of the site if the project site is not maintained in an orderly fashion, causing it to accumulate debris and resulting in haphazard visual conditions if surplus parts and materials become strewn about the site. The same mitigation measures as identified for the project would be required for this alternative, resulting in the same impact conclusions: less than significant with mitigation. Like the proposed project, impacts resulting to changes in light and glare under the Micro-Sited Alternative would be less than significant because new towers and rotors would be neutral and non-reflective and shadow flicker would not be a concern. This alternative would, thus, generate impacts similar to the project.

4.2.2.2 Agricultural and Forestry Resources

While this alternative proposes different locations for 31 of the 36 turbines, it would be located within the same project site and would result in the same land use intensity as the project. The project would have no impacts related to agricultural and forestry resources. Therefore, the Micro-Sited Alternative would also generate no impacts related to agricultural and forestry resources resulting in similar impacts as the project.

4.2.2.3 Air Quality

This alternative would result in the same construction and operational air quality emissions as the project. Activities would still occur adjacent to a sensitive receptor (i.e., the single residence within the project site who is leasing the house from the landowner). Because the same number of turbines would be constructed, construction equipment and vehicle use would be expected to be substantially similar to that of the project. Accordingly, the same mitigation measures as identified for the project would be required for this alternative. Overall, impacts related to air quality under this alternative would be similar to those under the project.

4.2.2.4 Biological Resources

Surface disturbance under the Micro-Sited Alternative would be similar or identical to that of the project, therefore, the effects on terrestrial biological resources would also be similar under this alternative and less than significant with mitigation.

Under the Micro-Sited Alternative, the same turbines proposed for use in the project would be used, but their locations would be adjusted, as shown in Figure 4-1, in response to the micro-siting study prepared for the project (Appendix F). The micro-siting study was performed in accordance with guidance first established by the Alameda County Scientific Review Committee (SRC) using a method to assign a relative risk category to each turbine (Smallwood and Estep 2010, in Estep 2020) using variables that include topographic and wind conditions and corresponding knowledge of raptor flight behavior, reported raptor fatalities, and to a lesser extent other risk factors such as proximity to perches, rock piles, and areas of high ground squirrel density (Appendix F). The micro-siting study was consistent with the SRC guidelines for siting wind turbines recommended for relocation (Alameda County Scientific Review Committee 2010). Note that the micro-siting process only considers risks to raptors; it is not intended to address risks to small birds or to bats. The micro-siting study included three iterations, in which Estep first identified the risk category for each proposed turbine and, for most turbines, recommended relocation to reduce the risk. The project proponent then considered the recommendations and evaluated each recommendation for regulatory, economic, and technical feasibility. In some cases, Estep's recommendations were accepted; in others, further analysis by Estep led to a revised recommendation that the project proponent determined to be feasible. The final siting recommendations are summarized as follows:

- Three turbines were removed from the project and replaced with turbines at three new locations.
- Five turbines were not recommended for relocation.
- Ten turbines were relocated in accordance with the initial relocation proposal.
- Eighteen turbines were relocated following a feasibility evaluation and further relocation studies.

This process led to the following changes in risk rating:

- Seventeen turbines were initially rated high risk; of these 7 remained high risk after micro-siting, 6 were reduced to moderate-high risk, 3 were reduced to moderate risk, and 1 was removed from the project. Thus 10 of 20, or 50% received a reduced risk rating.
- Eleven turbines were initially rated moderate-high risk; of these 7 remained moderate-high risk (although 5 of those were nonetheless somewhat reduced in risk), 3 were reduced to moderate risk, and 1 was removed from the project. Thus 4 of 11, or 36% received a reduced risk rating.
- Eight turbines were initially rated moderate risk; of these 6 remained moderate risk, 1 was elevated to a moderate-high risk rating, and 1 was removed from the project. Thus, none received a reduced risk rating.
- Three new turbines were located to replace the three removed turbines. These are all provisionally assigned high risk because they have not yet been micro-sited. Although the project proponent proposes to micro-site these turbines, that has not yet occurred and a high risk rating is conservatively assumed for these turbines.
- In total, the micro-siting process has moved from 17 high, 11 moderate-high and 8 moderate risk turbines, to 10 high, 14 moderate-high, and 12 moderate risk turbines, showing a substantial risk reduction.

Based on the apparent and substantial risk reduction achieved through the micro-siting process, the Micro-Sited Alternative would reduce raptor fatalities relative to the project. The micro-siting process does not address risk to small birds or to bats, so there is no expectation that fatalities in those groups would be reduced under the Micro-Sited Alternative. It is also important to note that the magnitude of the difference in raptor fatalities, relative to the project, cannot be quantified because the efficacy of micro-siting remains unknown. Although micro-siting has routinely been applied at most sites proposed for repowering in the APWRA, and at other areas such as in the nearby Montezuma Hills Wind Resource Area, still there have been no studies to verify the existence or magnitude of any biological benefits from micro-siting.

The Micro-Sited Alternative would have less impacts on biological resources than the project, although impacts would still be significant and unavoidable, as there is no feasible way to avoid bird and bat collisions with new wind turbines entirely. With the exception of Mitigation Measure BIO-11d, which requires completion of a micro-siting study, the same mitigation measures as identified for the project would be required for this alternative.

4.2.2.5 Cultural Resources

The Micro-Sited Alternative would vary slightly from the project in that 31 of 36 wind turbines would be constructed in different locations within the project site than identified in the project. However, the alternative would result in the same number of turbines and a similar amount of disturbance. For this reason, this alternative would have the same potential as the project to encounter a cultural resource during installation activity and the same project mitigation measures would be required. The impacts on cultural resources under this alternative would thus be similar to those under the project.

4.2.2.6 Energy

Consistent with the project, the Micro-Sited Alternative would not obstruct state or local plans for renewable energy or energy efficiency because it entails installation of wind turbines that would increase available renewable energy and assist California in meeting its RPS, GHG reduction, and carbon neutrality goals. Therefore, this alternative would provide energy benefits like project, and construction-related impacts would be the same, less than significant with mitigation. The impacts on energy under this alternative would thus be similar to those under the project.

4.2.2.7 Geology, Soils, Mineral Resources, and Paleontological Resources

Under the Micro-Sited Alternative, the same number of turbines would be installed resulting in similar ground disturbance as the project. The seismic conditions would be the same as the project and building safety requirements and mitigation measures would also be the same. Therefore, impacts related to surface fault rupture, strong ground shaking, or seismically induced ground failure would be the same as those identified in the project. For soil erosion and paleontological resources, the impacts would be similar to the project. As with the project, no septic system would be installed, and no mineral resources would be affected and for these issues there would be no impact. Overall, because the impacts would be similar and because a stormwater pollution prevention plan and the same mitigation measures as identified for the project would be required the impacts would be similar to the project.

4.2.2.8 Greenhouse Gas Emissions and Climate Change

While this alternative proposes different locations for 31 of the 36 proposed turbines, it would result in the same amount of energy generation as the project. The Micro-Sited Alternative would also result in the same construction and operational GHG emissions as the project, and as such, the same mitigation measures would be required for this alternative. Consequently, impacts related to GHG emissions under this alternative would be similar to those under the project.

4.2.2.9 Hazards and Hazardous Materials

This alternative would result in the same types of uses in the same site as the project, thus the same mitigation measures would be required for this alternative. Overall, this alternative would generate impacts on hazards and hazardous materials similar to those of the project.

4.2.2.10 Hydrology and Water Quality

This alternative would result in the same construction and operational hydrology and water quality impacts as the project. The potential for construction activities to result in increased erosion and discharge of sediment to surface waters would be similar to the project. While new turbines would be located in areas different than the project, they could still be placed in areas that impede existing drainage patterns similar to the project. Therefore, the same mitigation measures as identified for the project would be required for this alternative. Overall, impacts on hydrology and water quality under this alternative would be similar to those under the project.

4.2.2.11 Land Use and Planning

The project would have no impacts related to land use and planning. Because this alternative would result in the same uses as the project and within the same project site, the impacts of this alternative would be the same as those of the project. Thus, impacts under this alternative are considered similar to those under the project.

4.2.2.12 Noise

While the location of 31 of the 36 wind turbines would change, this alternative would result in construction noise similar to the project, although construction activities would occur farther from the on-site sensitive receptor (i.e., the single residence within project site who is leasing land from the landowner). Noise levels from operation under this alternative would be expected to be similar to the project's operational noise levels. Overall, the impacts under this alternative would be similar to those under the project.

4.2.2.13 Population and Housing

The project would generate no impacts related to population and housing. Because this alternative would result in construction and operation of the same uses as the project within the same project site, this alternative would also generate no impacts on population and housing. This alternative would thus generate impacts similar to those under the project.

4.2.2.14 Public Services

The project would generate no impacts related to public services. Because this alternative would result in construction and operation of the same uses as the project within the same project site, this alternative would also generate no impacts on public services. This alternative would thus generate impacts similar to those under the project.

4.2.2.15 Recreation

The project would generate no impacts related to recreation. Because this alternative would result in construction and operation of the same uses as the project within the same project site, it would also generate no impacts on recreation. This alternative would thus generate impacts similar to those under the project.

4.2.2.16 Transportation and Circulation

Under this alternative, the same number of turbines as under the project would be constructed, but they would be placed on different locations within the project site. Because equipment and construction activities would be similar to those of the project, the alternative would neither reduce nor increase impacts on transportation. The same mitigation measures as identified for the project would be required for this alternative and impacts on transportation under this alternative would be similar to those identified for the project.

4.2.2.17 Tribal Cultural Resources

The project would not have significant impacts on tribal cultural resources. Under this alternative, the same number of turbines as under the project would be constructed, though they would be located at different locations within the project site. Therefore, impacts on tribal cultural resources under this alternative would be less than significant. The alternative would thus generate impacts similar to those of the project.

4.2.2.18 Utilities and Service Systems

The project would not have significant impacts related to utilities and service systems. Because this alternative would result in construction and operation of the same uses as the project within the same project site, the impacts of this alternative would be the same as those of the project.

4.2.2.19 Wildfire

Under this alternative, the same number of turbines as under the project would be constructed, though they would be placed on different locations within the project site. Because equipment and construction activities would be similar to those of the project, the alternative would neither reduce nor increase impacts related to wildfire. The same mitigation measures as identified for the project would be required for this alternative to reduce impacts to less than significant with mitigation. Impacts related to wildfire under this alternative would be similar to those of the project.

4.2.3 Reduced Project Alternative

4.2.3.1 Aesthetics

The Reduced Project Alternative would differ from the project in that only 24 turbines would be installed. Eighteen turbines would be located at nearly the same locations as originally proposed within the project site (but with minor relocations due to the micro-siting process) and six would be located at a substantial distance (hundreds of feet) from any of the originally proposed turbines. The turbines proposed under the Reduced Project Alternative would be 10 meters (~7%) taller (based on total height from ground to top of blade) than those proposed under the project[3]. As with the project, this alternative would still have the potential to result in a significant impact on scenic resources, to affect scenic resources along a scenic highway, and to alter the existing visual character of the site if the project site is not maintained in an orderly fashion, causing it to accumulate debris and resulting in haphazard visual conditions if surplus parts and materials become strewn about the site. The same mitigation measures as identified for the project would be required for this alternative, resulting in the same impact conclusions: less than significant with mitigation. Like the proposed project, impacts on light and glare under the Reduced Project Alternative would be less than significant because new towers and rotors would be neutral and non-reflective and shadow

[3] The typical 3.0 MW turbine evaluated in the PEIR was assumed to be up to 153 meters (502 feet) in total height (from ground to top of blade), and the tallest turbine proposed under the project is 152 meters (499 feet) in total height. The turbines proposed under the Reduced Project Alternative would be approximately 10 meters higher in total height compared to the project, and 9 meters higher in total height compared to the typical 3.0 MW turbine evaluated in the PEIR, or an increase of approximately 7% in total height compared to either the project or the 3.0 MW turbines evaluated in the PEIR.

flicker would not be a concern. Notwithstanding the minor increase in turbine height, considering the reduced number of turbines, impacts on aesthetics would be less than those of the project.

4.2.3.2 Agricultural and Forestry Resources

While this alternative proposes fewer turbines than the project, the alternative would be located within the same project site and would result in the same land use as the project. The project would have no impacts related to agricultural and forestry resources. Therefore, the Reduced Project Alternative would also generate no impacts related to agricultural and forestry resources resulting in impacts similar to the project.

4.2.3.3 Air Quality

With 12 fewer wind turbines than the project, this alternative would result in reduced total construction air quality emissions compared to the project. However, activities could still occur adjacent to sensitive receptors (i.e., the residence within the project site who is leasing land to the applicant), and construction equipment and vehicle use on maximum activity days (the basis for impact determination) would be expected to be similar to that of the project. Trips related to operations and maintenance would be similar. Accordingly, the same mitigation measures as identified for the project would be required for this alternative to reduce impact to less than significant with mitigation. Overall, because this alternative would result in less construction than the project, impacts related to air quality under this alternative would be less than those under the project, but would still be less than significant with mitigation.

4.2.3.4 Biological Resources

Surface disturbance under the Reduced Project Alternative would be similar in nature, but less extensive than under the project; therefore, the effects on terrestrial biological resources would be less than the project, but would still be less than significant with mitigation.

The Reduced Project Alternative would replace 36 2.2 MW capacity turbines proposed under the project with 24 micro-sited 3.465 MW turbines (Figure 4-2). Compared to the project, only 24 (rather than 36) turbines would be installed, of which 18 would be located at nearly the same locations as under the project (but with minor relocations due to the micro-siting process) and 6 would be located at a substantial distance (hundreds of feet) from any of the project turbines. The project capacity is 80 MW with a total RSA of 40.7 ha (Table 4.3-4), while the Reduced Project Alternative has a nameplate capacity of 83.16 MW but would be limited to 80 MW operational capacity; its RSA would be 32.8 ha, a 19% reduction compared to the project. Based purely upon the nameplate considerations, the Reduced Project Alternative would be expected to decrease avian and bat fatalities of every focal species or species group by up to 19% based on changed RSA. As discussed in detail in Chapter 3 (*Methods for Analysis: Avian Fatality Analysis Methods*), RSA is widely regarded as a plausible metric for avian and bat fatality risk, and accordingly the Reduced Project Alternative would be expected to reduce fatality risk relative to the project. It is important to note, though, that the micro-siting process is intended to reduce raptor fatalities; it does not evaluate or address small bird or bat fatalities. Thus, any benefits from micro-siting in and of itself may only accrue to raptors. The primary benefits of the Reduced Project Alternative would result from the reduction in RSA, which could benefit small birds and bats as well as raptors.

The Reduced Project Alternative would also ~~increase~~ reduce daylight operational hours by 50% by increasing turbine cut-in speeds to approximately 4.5 to 5 m/s during all daylight hours~~. Based on wind speed data provided by the Applicant, this operational measure would reduce~~ (the exact cut in speed change will depend on the turbine model selected). This reduction in operational ~~daylight hours by approximately 50%, resulting~~ hours during the time eagles may be flying is expected to result in a commensurate decrease in ~~expected~~ eagle fatalities. The Applicant has proposed this measure recognizing the explicit relationship between operation during the time that eagles are active and flying during the daytime and the potential they would be struck and killed during those daylight hours. Indeed, the USFWS uses a specific "collision risk model," which uses the number of operational daylight hours as one of the primary variables affecting the risk of take of eagles (USFWS 2013). Accordingly, the proposed cut-in speed increase would not only result in a substantial reduction in eagle fatalities, relative to the project, but also would have significant benefits to other raptors and smaller birds. This would be in addition to the benefit produced by the 19% reduction in RSA compared to the proposed project.

The following points of discussion address residual uncertainty that the Reduced Project Alternative would reduce fatalities.

Micro-siting: The efficacy of micro-siting remains unknown. Although micro-siting has routinely been applied at most sites proposed for repowering in the APWRA, and at other areas such as in the nearby Montezuma Hills Wind Resource Area, there have been no studies to verify the magnitude of biological benefit from micro-siting.

Heterogeneity in Fatalities: Repowering studies performed to date, discussed in detail in Section 3.4, *Biological Resources*, clearly show that the spatial distribution of avian and bat fatalities is highly heterogeneous or divergent within the APWRA. Golden Hills and Golden Hills North fatality rates, shown in Table 3.4-5, represent good examples for discussion. Although the two projects use similar turbines with similar RSA values, and used similar monitoring and observation methods, the "all raptor" fatality rates at Golden Hills are over twice as high as at Golden Hills North. "All bat" fatality rates are nearly twice as high at Golden Hills North as at Golden Hills. Clearly, the different locations of these projects produce substantial differences in effects on different species, for reasons that are independent of the properties of the turbines themselves. Those reasons are unknown, but plausibly relate to the biology of the affected species, such as where they nest, where they forage, or where they migrate. For this reason, it is possible that on an individual basis, the turbine locations proposed under the Reduced Project Alternative would result in greater avian and/or bat fatality rates than the turbine locations proposed under the project. Since micro-siting has been done, this is less likely to affect raptors. Since micro-siting does not consider impacts on birds other than raptors, or on bats, there is no reason to expect any benefit to these animals. Overall, the Reduced Project Alternative would still be expected to result in less avian and/or bat fatality rates compared to the proposed project, simply because of its RSA reduction, with further substantial benefits accruing to eagles and potentially to other birds due to the cut-in speed increase.

Turbine Size: The turbines proposed under the Reduced Project Alternative are 10 meters taller (approximately 7%) than those proposed under the project; taller turbines have been implicated in increased bat fatality rates at wind farms in the eastern United States (Arnett et al. 2016; Cryan et al. 2014; Foo et al. 2017), and the mechanism of those fatalities, a bat affinity for tall structures, may apply at the APWRA as well. Thus, it is possible that the Reduced Project Alternative would result in increased bat fatality rates, on a unit RSA basis, relative to the project. However, similar to avian species, RSA is widely regarded as a plausible metric for bat fatality risk, and accordingly the

Reduced Project Alternative would be expected to reduce the fatality risk of bats relative to the project, with further benefits accruing due to the cut-in speed increase. These benefits almost certainly outweigh any increased fatalities attributable to the small turbine height change.

Notwithstanding the uncertainties surrounding the efficacy of micro-siting, it is the County's determination that the Reduced Project Alternative would have substantially reduced impacts on biological resources compared to the project, primarily due to the 19% reduction in RSA relative to the project, and with benefit for eagles and potentially other raptors and smaller birds, the increased cut-in speeds. Reduced impacts on terrestrial species would also result from fewer turbine sites and other supporting infrastructure. Impacts would still be significant and unavoidable, as there is no feasible way to entirely avoid bird and bat collisions with new wind turbines. With the exception of Mitigation Measure BIO-11d, which requires completion of a micro-siting study, the same mitigation measures as identified for the project would be required for this alternative.

4.2.3.5 Cultural Resources

The Reduced Project Alternative would vary slightly from the project in that there would be fewer wind turbines and these turbines would be in different locations within the project site than identified for the project. With reduced ground disturbance required for 24 wind turbines as opposed to 36, this alternative would generate a reduced potential to encounter a cultural resource during installation activity. While the amount of ground disturbance would be reduced, the nature of potential impacts on cultural resources would remain similar and thus the same project mitigation measures would be required. Overall, the impacts on cultural resources under this alternative would thus be less than those under the project, and still less than significant with mitigation.

4.2.3.6 Energy

Consistent with the project, the Reduced Project Alternative would not obstruct state or local plans for renewable energy or energy efficiency because it entails installation of wind turbines that would increase available renewable energy and assist California in meeting its RPS, GHG reduction, and carbon neutrality goals. With 12 fewer wind turbines compared to the project, the construction under this alternative would consume a lesser amount of energy overall. With each wind turbine providing a higher amount of energy production potential it would offset the same amount of energy as the project during operation (80 MW). Therefore, this alternative would provide energy benefits like the project, and impacts would be the same (less than significant with mitigation). The impacts on energy under this alternative would thus be less than those under the project as a result of less energy consumed during construction.

4.2.3.7 Geology, Soils, Mineral Resources, and Paleontological Resources

Under the Reduced Project Alternative, fewer wind turbines would be installed resulting in less ground disturbance than the project. The seismic conditions would be the same as the project and building safety requirements and mitigation measures would also be the same. Therefore, impacts related to surface fault rupture, strong ground shaking, or seismically induced ground failure would be the same as those identified in the project. As with the project, no septic system would be installed, and no mineral resources would be affected and for these issues there would be no impact. With reduced ground disturbance required for 24 wind turbines as opposed to 36, this alternative would generate a slightly reduced potential to encounter paleontological resources during installation activities. Therefore, impacts would be less than those of the project.

4.2.3.8 Greenhouse Gas Emissions and Climate Change

This alternative proposes a reduced number of wind turbines that produce a higher amount of energy individually than the project, which would result in a similar amount of total energy generation than the project. The Reduced Project Alternative would also result in a proportionally reduced amount of construction and operational GHG emissions as the project. Overall, the alternative would still require the same mitigation measures as required for the project. Consequently, impacts related to GHG emissions under this alternative would be less than those under the project as a result of reduced construction activity.

4.2.3.9 Hazards and Hazardous Materials

This alternative would result in the same types of uses though slightly less intense, in the same site as the project. Thus, the same mitigation measures would be required for this alternative. Overall, this alternative would generate impacts on hazards and hazardous materials less than those of the project.

4.2.3.10 Hydrology and Water Quality

With 24 as opposed to 36 turbines, this alternative would result in the slightly less construction and operational hydrology and water quality impacts than the project. The potential for construction activities to result in increased erosion and discharge of sediment to surface waters would be similar to, though slightly less than the project. While new turbines would be located in areas different than the project, they could still be placed in areas that impede existing drainage patterns similar to the project. Therefore, the same mitigation measures as identified for the project would be required for this alternative. Overall, impacts on hydrology and water quality under this alternative would be less than the project.

4.2.3.11 Land Use and Planning

The project would have no impacts related to land use and planning. Because this alternative would result in the same uses as the project, though with fewer turbines, and within the same project site, the impacts of this alternative would be the same as those of the project. Thus, impacts under this alternative are considered similar to those under the project.

4.2.3.12 Noise

The Reduced Project Alternative would differ from the project in that only 24 turbines would be installed. Eighteen would be located at nearly the same locations as originally proposed within the project site (but with minor relocations due to the micro-siting process) and six would be located at a substantial distance (hundreds of feet) from any of the originally proposed turbines. Construction activities would occur at the same distance from the onsite sensitive receptor (i.e., the residence within the project site who is leasing land from the landowner), and the same types of construction equipment would be required, resulting in similar maximum noise levels during construction. Noise levels from operation under this alternative would be reduced due to the reduced number of turbines. Overall, the impacts under this alternative would be less than significant and less than those under the project.

4.2.3.13 Population and Housing

The project would generate no impacts related to population and housing. Because this alternative would result in construction and operation of the same uses as the project within the same project site, the impacts of this alternative would also generate no impacts on population and housing. This alternative would thus generate impacts similar to those under the project.

4.2.3.14 Public Services

The project would generate no impacts related to public services. Because this alternative would result in construction and operation of the same uses as the project within the same project site, this alternative would also generate no impacts on public services. This alternative would thus generate impacts similar to those under the project.

4.2.3.15 Recreation

The project would generate no impacts related to recreation. Because this alternative would result in construction and operation of the same uses within as the project the same project site, it would also generate no impacts on recreation. This alternative would thus generate impacts similar to those under the project.

4.2.3.16 Transportation and Circulation

Under this alternative, fewer wind turbines than under the project would be constructed, and some would be placed on different locations within the project site. Because equipment and construction activities would be incrementally less than under the project, the alternative would incrementally reduce impacts on transportation overall, although construction equipment and vehicle activity on maximum activity days would be expected to be similar. The same mitigation measures as identified for the project would be required for this alternative and impacts on transportation under this alternative would be less than the project.

4.2.3.17 Tribal Cultural Resources

The project would not have significant impacts on tribal cultural resources. Under this alternative, 12 fewer wind turbines would be constructed than under the project, some of which would be located at different locations within the project site. Therefore, impacts on tribal cultural resources under this alternative would also be less than significant. With reduced ground disturbance as well, the alternative would be expected to have comparably lower impacts compared to the project.

4.2.3.18 Utilities and Service Systems

The project would not have significant impacts related to utilities and service systems. Because this alternative would result in less construction as the project, it would require a corresponding less amount of water for construction. Operation of this alternative may require the same or slightly less water compared to the project due to fewer turbines to maintain. All other aspects with respect to utilities and service systems would be the same as the project. Therefore, the impacts of this alternative would be less than those of the project.

4.2.3.19 Wildfire

Under this alternative, 12 fewer wind turbines would be constructed compared to the project, some of which would be placed on different locations within the project site. Because equipment and construction activities would be similar to those of the project, the alternative would neither reduce nor increase impacts related to wildfire. The same mitigation measures as identified for the project would be required for this alternative. Impacts related to wildfire under this alternative would be less than the project.

4.3 Environmentally Superior Alternative

The State CEQA Guidelines require that an environmentally superior alternative be identified. The environmentally superior alternative is the alternative that would avoid or substantially lessen, to the greatest extent, the environmental impacts associated with the project while feasibly attaining most of the major project objectives. If the alternative with the least environmental impact is determined to be the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

The identification of the environmentally superior alternative results from a comparison of the impacts associated with each alternative to those of the project, as shown in Table 4-1. The No Project – No Repowering Alternative is the environmentally superior alternative because by not providing repowering of the project site it avoids all environmental impacts. However, the No Project – No Repowering Alternative would not assist California in meeting its Renewables Portfolio Standard, GHG reduction, and carbon neutrality goals. The No Project – No Repowering Alternative also fails to achieve any of the project's objectives. In addition, CEQA Guidelines Section 15126.6 (e)(2) requires that, if the no project alternative is the environmentally superior alternative, another alternative must be identified that is the environmentally superior alternative. Consequently, the Reduced Project Alternative would be considered the environmentally superior alternative.

As discussed above, the Reduced Project Alternative would result in a reduction in impacts related to aesthetics, air quality, biological resources, cultural resources, energy, geology/soils/minerals/paleontological resources, greenhouse gas emissions, hazards and hazardous materials, noise, transportation, tribal cultural resources, utilities and service systems, and wildfire relative to the project, and would not result in greater impacts than the project in other areas. Therefore, the Reduced Project Alternative is the environmentally superior alternative.

4.4 References Cited

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Chapter 5
Other CEQA Considerations

5.1 Overview

This chapter contains discussions and analyses of the following topics, as required by the California Environmental Quality Act (CEQA).

- Cumulative impacts.
- Growth-inducing impacts.
- Significant and unavoidable environmental impacts.
- Significant irreversible environmental impacts.

5.2 Cumulative Impacts

5.2.1 Approach to Impact Analysis

5.2.1.1 Legal Requirements

The CEQA Guidelines require that the cumulative impacts of a project be addressed in an Environmental Impact Report (EIR) when the cumulative impacts are expected to be significant and when the project's incremental effect is cumulatively considerable (CEQA Guidelines Section 15130[a]). Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (CEQA Guidelines Section 15355[b]). Such impacts can result from individually minor but collectively significant actions taking place over time.

Section 15130 of the CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

5.2.1.2 PEIR Cumulative Impact Background

The Program EIR (PEIR) Sections 5.4.1 and 5.4.2 provided a detailed description of the cumulative background for the cumulative impacts analysis, including a topic-by-topic description of the cumulative background. This section describes that the PEIR used "a combination of the plan/projections and list approaches, using the land use designations of the ECAP [East County Area Plan] in combination with known other relevant projects in the APWRA [Altamont Pass Wind Resource Area] area" and is incorporated herein by reference. Wind energy repowering in the program area since the PEIR was certified include the following projects, two of which were anticipated in the PEIR, and the third, Rooney Ranch, was among the sites that were considered by the County for repowering in 1998. A Final Subsequent EIR for the Sand Hill Wind project proposed by sPower, another project anticipated in the PEIR, was also recently published. These projects are described in more detail in Table 2-6 in Chapter 2*, Project Description.* For this reason, the cumulative background analysis used in the PEIR has not substantially changed since the adoption of the PEIR.

Approved Repowering Projects Since 2014[1]

- Golden Hills North
- Summit Wind
- Rooney Ranch

5.2.2 Analysis of Cumulative Impacts

PEIR Section 5.4.2 provided a detailed description of the cumulative impacts of the implementation of the program. The findings and analysis found in Section 5.4.2 of the PEIR are incorporated herein by reference. The following cumulative impacts discussion is organized by first considering topics addressed in the PEIR to determine whether there is an existing cumulative impact and then identifies whether project would make a cumulatively considerable contribution to identified impacts. Second, this discussion considers topics that were not assessed in the PEIR.

Both the PEIR and this Subsequent EIR (SEIR) found that the program and project, respectively, would generate no impacts in the following areas:

- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

Because there are no impacts anticipated at both the program and project level, these topics are not considered further in the project's cumulative analysis.

The PEIR found that the program could generate impacts to the following topics. Each of these topics is discussed below to determine whether the project would make a cumulatively considerable contribution to identified impacts:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources

[1] ~~The~~ As discussed in Chapter 2, Project Description, the Sand Hill Project was approved by the County in February 2020, based on a 109.5-MW alternative evaluated in its SEIR, instead of the project proposal for a 144.5-MW project. Certification of the Sand Hill Final SEIR and approval of the CUP was subsequently appealed ~~and its approval is presently being held in abeyance pending a~~ . A hearing to consider the appeal was held by the Alameda County Board of Supervisors ~~to consider the appeal~~ on December 15, 2020, during the public review period for the Mulqueeney Ranch draft SEIR. At that hearing, the Board denied the appeal and upheld the Sand Hill SEIR and approved a revised project with a maximum capacity of 50 MW and no more than 16 total turbines.

- Cultural Resources
- Geology, Soils, and Paleontological Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Transportation

While the conclusions of PEIR Section 5.4.2 found that the program would not contribute to a cumulative impact related to most of these resources, it did identify cumulative impacts to air quality, biological resources, and transportation.

5.2.2.1 Cumulative Project Impacts for Topics Identified in the PEIR

In this section, the cumulative impacts identified in the PEIR are examined to determine whether the project would make a cumulatively considerable contribution to those impacts.

Aesthetics

PEIR Analysis

The geographic scope considered for potential cumulative impacts on visual/aesthetic resources in the PEIR was the viewshed of the public and recreational users common to the program area. Within the viewshed of the program area and project sites, the Vasco Wind project, in combination with the proposed program and projects, was found to contribute to cumulative impacts on visual/aesthetic resources. The Vasco Wind Repowering Project could affect views from Vasco Road, which is a County-designated scenic route where no turbines currently exist in Alameda County. A portion of Vasco Road is located in the northwestern corner of the program area boundary. Therefore, the program was found to contribute to a cumulatively considerable impact on this County-designated scenic route. However, existing Alameda and Contra Costa County policies would prevent the program from contributing to a cumulatively significant impact.

When considered with the Vasco Wind Repowering Project, the PEIR concluded that the program could contribute to a cumulatively considerable impact on visual character where no turbines exist near the northern boundary of the program area but that Alameda County Policy ECAP 105, together with Mitigation Measures AES-2a, AES-2b, AES-c, AES-3, and AES-5, would prevent the proposed program from contributing to a cumulatively considerable impact. In addition, the PEIR concluded that cumulative impacts on daytime and nighttime views resulting from light and glare would be less than significant for the proposed program through compliance with existing Alameda County policies and measures included in the program, and cumulative impacts on daytime and nighttime views for the Vasco Winds Repowering Project would be avoided with implementation of Mitigation Measure AES-5. Therefore, the PEIR concluded that the program would not result in a cumulative impact because the combined impacts of the projects would not create a new source of light, glare, or shadow flicker experienced by residents and businesses of sufficient magnitude that day or nighttime views in the area would be substantially degraded.

Project Analysis

The characteristics of the proposed project with respect to construction activities and views during operation would be consistent with the evaluation of the project site in the PEIR. Therefore, the project would not result in or contribute to a cumulative impact.

Agricultural and Forestry Resources

PEIR Analysis

The geographic scope considered for potential cumulative impacts on agricultural resources in the PEIR was the program area. The program area contains 24.21 acres of Prime Farmland and 0.36 acre of Farmland of Statewide Importance. PEIR Mitigation Measure AG-1 would ensure that no Prime Farmland or Farmland of Statewide Importance is converted to nonagricultural use. Because the program would not result in any impacts on farmland or forestry resources, it would not result in a cumulative impact.

Project Analysis

The characteristics of the proposed project with respect to construction activities and views during operation would be consistent with the evaluation of the project site in the PEIR. Therefore, as described in the preceding section, no cumulative impact on farmland or forestry resources would occur.

Air Quality

PEIR Analysis

The geographic scope considered for potential cumulative impacts on air quality in the PEIR was the San Francisco Bay Area Air Basin managed by the Bay Area Air Quality Management District (BAAQMD). The PEIR found that construction emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X) for the program would be greater than the BAAQMD thresholds after the implementation of PEIR Mitigation Measures AQ-2a and AQ-2b, and therefore cumulative construction impacts would be significant and unavoidable. With respect to operational impacts, the PEIR found that the program would not result in new permanent stationary sources of criteria pollutants, nor would operation increase criteria pollutant emissions from any existing stationary sources. Therefore, the PEIR's cumulative operational impacts would be less than significant.

Project Analysis

Consistent with the PEIR cumulative air quality analysis, the cumulative setting for the project air quality analysis is the San Francisco Bay Area Air Basin managed by BAAQMD. The project would generate less-than-significant impacts for each air quality threshold related to project operation, with mitigation required for construction related emissions. With respect to operational impacts, the project would not result in new permanent stationary sources of criteria pollutants, nor would operation increase criteria pollutant emissions from any existing stationary sources. With respect to construction impacts, construction of the project would generate ROG, though not above the BAAQMD threshold (less than significant), NO_X that exceed the BAAQMD threshold, and localized particulate (PM2.5 and PM10) and diesel particulate matter that also exceed the BAAQMD threshold. PEIR Mitigation Measures AQ-2a and AQ-2b would be required to reduce NO_X and fugitive dust emissions from project construction. Implementation of an additional measure, 2020 NEW

Mitigation Measure AQ-2c, would reduce the remaining NO_X exceedance to a less-than-significant level. Similarly, implementation of PEIR Mitigation Measures AQ-2a and AQ-2b, which require regular watering, covering of materials, and other practices, would reduce construction-related fugitive dust emissions such that neither diesel particulate matter, PM2.5 nor PM10 emissions would exceed BAAQMD's thresholds of significance.

The PEIR identified no cumulative impact related to localized particulate and diesel particulate matter. Therefore, the project's mitigated construction impact to a less-than-significant level would not result in or contribute to a cumulatively considerable impact.

As stated above, with respect to NO_X and ROG emissions, the PEIR found that the cumulative program emissions would be greater than the BAAQMD thresholds after the implementation of PEIR Mitigation Measures AQ-2a and AQ-2b, and therefore cumulative construction impacts would be significant and unavoidable. Although the project would generate ROG and NO_X below the BAAQMD threshold (see Impact AQ-2, PEIR Mitigation Measures AQ-2a and AQ-2b, and 2020 NEW Mitigation Measure AQ-2c), the project generated ROG and NO_X emissions would contribute to the cumulative impact identified in the PEIR. Therefore, because the amounts of project-generated ROG and NO_X would be substantial, the contribution to the cumulative air quality impact would be cumulatively considerable during construction. The project would therefore result in a significant and unavoidable cumulative air quality impact.

Biological Resources

PEIR Analysis: Avian and Bat Mortality

Geographic Scope of Analysis

In the PEIR, the geographic scope for analysis of cumulative impacts associated with avian and bat fatalities through turbine collision was considered in the context of the entire APWRA (both Alameda and Contra Costa Counties) as well as the Montezuma Hills Wind Resource Area (MHWRA) in Solano County. Since certification of the PEIR, changed understanding about the population status of avian and bat resources now enables a more precise definition of the geographic scope for the analysis. The geographic scope differs with regard to the affected resources. For golden eagles, guidance from the U.S. Fish and Wildlife Service (USFWS) (2013) addresses potential effects on the Local Area Population (LAP), which includes all golden eagles within a 109-mile radius from the project site. The use of this large area, much larger than the area considered in the PEIR, is shown to be appropriate through recent work by Hunt et al. (2017) finding that immigration from golden eagles originating outside the Diablo Range, as well as emigration from the area, are important factors in the dynamics of golden eagle populations in the APWRA and vicinity. For birds other than golden eagles, USFWS evaluates population status and trends with regard to Bird Conservation Region (BCR) 32, which is one of 66 such regions established by the U.S North American Bird Conservation Initiative (NABCI) Committee to monitor bird conservation efforts in North America. BCR 32, Coastal California, includes most of the Central Valley and extends from there westward to the Pacific Ocean, and south into northern Baja California[2]. Population estimates for all bird species in BCR 32 are annually issued by Partners in Flight (2020), an NABCI partner. With regard to bats, there is no generally accepted geographic demarcation for monitoring of bat population status. For

[2] A map and description of BCR 32 are available at https://nabci-us.org/resources/bird-conservation-regions-map/ (accessed September 16, 2020).

this analysis, the geographic scope for hoary bat is western North America, based on information (discussed later in this analysis) that indicates hoary bats in the APWRA are nearly all migratory, derived from this very large region. The other bats of principal concern in the APWRA, Mexican freetail bat and western red bat, are resident or migrate locally, with some migrations between the Central Valley and coastal areas; for these bats the geographic scope of analysis is a circle of 100 mile radius, which incorporates areas from the coast to the Central Valley.

Methods and General Analysis

The project would increase permitted APWRA capacity by 80 megawatts (MW). The PEIR (Alameda County Community Development Agency 2014) analyzed effects of an increase in total generating capacity of the APWRA up to 450 MW; with the proposed project, total APWRA capacity permitted under the PEIR would be 444.3 MW (Table 2-5), within the limit evaluated in the PEIR. In order to understand the cumulative effect of the PEIR's 450 MW alternative on avian and bat populations, the County compared estimated impacts from the 80 MW project (Chapter 3, Impacts BIO-11 and BIO-14) to those estimated for 450 MW for the entire APWRA (Table 5-1). Table 5-1 in this SEIR is similar to Table 3.4-12 in the PEIR, but has been developed using all currently available fatality rate data, as shown in Table 3.4-4 and Table 3.4-5 in this SEIR. Those fatality rates were extrapolated to a 450 MW repowered capacity to calculate estimated number of fatalities for each species or group. To estimate the project's contribution to APWRA-wide fatalities, the County divided estimates of project-related fatalities by estimates of APWRA-wide fatalities. Overall, the project represents approximately 18 percent of approved increases in wind power capacity in the entire APWRA, and thus makes an approximate 18 percent contribution to the fatalities anticipated under the PEIR 450 MW alternative, for all birds. As detailed in Section 3.4, *Biological Resources*, Impact BIO-11, the results support the hypothesis that for all raptors, including golden eagles, fatality rates have decreased in comparison to non-repowered projects evaluated in the PEIR; the size of decrease for each species or species group is shown in Table 3.4-8a in this SEIR. Also as discussed in that analysis, the PEIR likely substantially underestimated fatality rates for nonraptors and bats at both non-repowered and repowered projects, but repowering has nonetheless likely decreased actual fatality rates for nonraptors, as calculated on either a MW or RSA basis. For bats, however, repowering has likely increased fatality rates, for reasons detailed in Section 3.4, Impact BIO-14. For all groups, cumulative impacts under the 450 MW development alternative are of the same type as discussed in impacts BIO-11 and BIO-14, but are numerically increased proportional to the difference between the 80 MW project and the 450 MW PEIR alternative. The significance of this change for each species or species group is presented below.

Table 5-1. Estimated Annual Avian and Bat Fatalities for the PEIR 450 MW Alternative Based on Existing Fatality Survey Data

Species or Group	Project Type[a,b]						
		Repowered					
	Not Repowered	Buena Vista Fatalities /yr	Diablo Winds Fatalities /yr	Golden Hills Fatalities /yr	Golden Hills North Fatalities /yr	Vasco Winds Fatalities /yr	Average Fatalities /yr
American kestrel	266	50	41	44	78	128	68
Barn owl	109	12	9	13	10	10	11
Burrowing owl	349	0	378	86	0	25	98
Golden eagle	36	33	5	51	29	20	27
Loggerhead shrike	85	0	0	14	0	11	7
Prairie falcon	9	12	nd	2	10	4	7
Red-tailed hawk	198	72	90	255	68	95	116
Swainson's hawk	1	0	nd	0	0	0	0
Tricolored blackbird	nd	0	nd	8	10	10	9
Vaux's swift	nd	0	nd	82	0	40	41
White-tailed kite	nd	0	nd	26	0	0	6
Yellow-breasted chat	nd	0	nd	0	10	0	5
Yellow warbler	nd	12	nd	31	10	64	20
All raptors	1,094	168	545	517	264	290	357
All native non-raptors	**2,027**	**680**	**1,130**	**3,417**	**4,246**	**916**	**3,831**
Hoary Bats	nd	107	nd	1,194	1,105	453	1,150
Mexican free-tailed bats	nd	24	nd	1,653	5,136	846	3,395
All bats	**nd**	**357**	**nd**	**3,041**	**6,564**	**1,443**	**4,803**

Note:
nd = no data; this species was not evaluated in the represented project.
Only Golden Hills and Golden Hills North values are used in calculation of minimum, maximum, and average values for non-raptors or bats; see Section 3.4.3, *Environmental Impacts*, under *Methods for Analysis* for rationale.
[a] All estimates based on a PEIR Alternative capacity of 450 MW.
[b] All mortality rates taken from Tables 3.4-4 and 3.4-5 (see notes there appended for data sources and other caveats) and extrapolated to a 450 MW capacity.

Within the larger geographic scope for each resource, estimates of total fatalities attributable to wind power are available for the APWRA and for the MHWRA (Table 5-2). For the APWRA these estimates are based on the fatality rates recorded in Table 3.4-4 in this SEIR multiplied by the operational capacity of the APWRA[3], assuming the project were to be constructed. For the MHWRA these estimates are based on a total capacity of 1,022 MW, with fatality rates summarized from Appendix C of the Montezuma II Wind Project EIR (ICF International 2010); these fatality rates consider results from the High Winds, Shiloh I, Shiloh II, and Solano projects. Since RSA-based fatality rates are not available for the MHWRA projects, the analysis considers fatality rates on a MW basis, and based on comparisons between MW and RSA fatality rate estimates shown in Tables 3.4-4 and Table 3.4-5 in this SEIR, this may underestimate true fatalities by approximately 20%, a

[3] Projects in the APWRA include Buena Vista (38.0 MW), Vasco (78.2 MW), Summit (57.5 MW), ~~Patterson Pass (19.8 MW),~~ Golden Hills (85.9 MW), Golden Hills North (46.0 MW), Diablo (20.5 MW), Sand Hill (~~109.5~~ 50.0 MW), Rooney Ranch (25.1MW), and the proposed project (~~79.2~~ 80.0 MW) totaling ~~559.7~~ 481.2 MW of installed capacity.

circumstance considered in reaching a cumulative impact conclusion. Due to the age of some of these monitoring data, they are relatively consistent in their treatment of raptors, but are highly variable in their treatment of smaller birds and of bats, another circumstance considered in reaching a cumulative impact conclusion.

There are no available estimates of fatalities attributable to the wide range of causes (other than wind power) operating in the LAP, in BCR 32, or in the geographic scope for bats. Accordingly, assessment of potential for a cumulative impact within the full geographic scope is based on evidence regarding the potential for wind power generation to affect the population status of a resource. The evidence for this is highly species-specific, but to offer an example, if a species is widespread and is only subject to wind power impacts in a relatively small part of its range, then wind power has a low potential to substantially affect population status. Conversely, if a species is affected by wind power generation in a large portion of its range, and particularly if the population is in decline, then it is highly probable that its population status is affected by wind power. The magnitude of the cumulative effect depends upon fatality rates and the population size in the study area. Cumulative effects for each species or species group are discussed in this context below, based on the data given in Table 5-2.

Table 5-2. Cumulative Impacts on Species and Species Groups

Species/Group	Fatalities Under 450 MW Alternative (1)	Fatalities in Combined APWRA and MHWRA (2)	BCR 32 Population Estimate (3)	Percent of Population Affected Under 450 MW Alternative	Percent of Population Affected by APWRA plus MHWA wind power	Population Trend (4)
American kestrel	68	~~233~~ 221	110,000	0.06%	~~0.21~~ 20%	decline / low
Barn owl	11	*~~47~~ 36*	19,000	0.06%	~~0.25~~ 19%	constant / moderate
Burrowing owl	98	*~~428~~ 326*	9,700	1.01%	~~4.41~~ 3.37%	decline / low
Golden eagle	27	~~44~~ 40	see text	see text	see text	see text
Loggerhead shrike	7	*~~31~~ 24*	160,000	0.00%	~~0.02~~ 0.01%	decline / low
Prairie falcon	7	*~~30~~ 23*	2,400	0.29%	~~1.26~~ 0.96%	increase / high
Red-tailed hawk	116	~~259~~ 239	150,000	0.08%	~~0.17~~ 0.16%	increase / high
Swainson's hawk	0	*0*	41,000	0.00%	0.00%	increase / high
Tricolored blackbird (5)	9	*~~39~~ 30*	177,656	0.00%	0.02%	decline / high
Vaux's swift	41	*137*	5,500	0.74%	2.48%	increase / moderate
White-tailed kite	6	~~14~~ 13	9,100	0.07%	~~0.15~~ 0.14%	decrease / low

Species/Group	Fatalities Under 450 MW Alternative (1)	Fatalities in Combined APWRA and MHWRA (2)	BCR 32 Population Estimate (3)	Percent of Population Affected Under 450 MW Alternative	Percent of Population Affected by APWRA plus MHWA wind power	Population Trend (4)
Yellow-breasted chat	5	*16*	60,000	0.01%	0.03%	decrease / moderate
Yellow warbler	20	*68*	130,000	0.02%	0.05%	constant / low
All raptors	**357**	**~~638~~ 576**	**913,200**	**0.04%**	**~~0.07~~ 0.06%**	**see text**
All native non-raptors	**see text**	**see text**	**see text**	**see text**	**see text**	**see text**
Hoary Bats	1,150	*~~5,030~~ 3,841*	see text	see text	see text	see text
Mexican free-tailed bats	3,395	*~~14,851~~ 11,339*	see text	see text	see text	see text
All bats	**4,803**	***~~21,011~~ 16,043***	**see text**	**see text**	**see text**	**see text**

1. From Table 5-1 in this SEIR.
2. For APWRA, this is the average of per-MW fatality rates for all repowered facilities times total APWRA capacity of ~~560 MW.~~ 481.2 MW. This is based on the 365 MW of projects listed in Table 2-6 in Chapter 2, *Project Description*, plus two projects in Contra Costa County: Buena Vista at 38 MW and Vasco Winds at 78.2 MW. For MHWRA, this is based on per-MW fatality rates given by ICF (2010, Table 5), times total MHWRA capacity of 1022 MW. The ICF (2010) value for "large birds" is used here for "all raptors," and the values for "medium birds" plus "small birds" are used here for "all native non-raptors." Values in italics indicate that the species was not tabulated by ICF (2010) and these values were estimated by taking the per-MW fatality rates for repowered projects in the APWRA and extrapolating to the total developed capacity of the APWRA plus MHWRA.
3. From Partners in Flight (2020), for BCR 32. Partners in Flight does not provide an estimate for the golden eagle. Only raptors that have been recorded as fatalities in the APWRA (according to ICF International [2016]) are included in the "all raptors" population estimate.
4. From USGS (2020, 2021), summarizing population trend estimates for BCR 32 for all years since 1966 ~~to 2017.~~ and indicating confidence level ("credibility" in USGS [2020, 2021]) of low, moderate, or high.
5. Source for population size and trend data is Meese (2017).

Species-Specific Analysis

American kestrel: For the 450 MW PEIR alternative, there would be an estimated 68 American kestrel fatalities per year, and for the combined APWRA and MHWRA, there would be ~~233~~ 221 fatalities per year. BCR 32 has an estimated American kestrel population of 110,000 birds, so the estimated annual loss is approximately 0.06% for the 450 MW PEIR alternative, and ~~0.2~~ 0.20% for the combined APWRA and MHWRA. The American kestrel is an extremely widespread and common species in BCR 32, with overall population likely influenced by many factors in addition to APWRA and MHWRA wind power generation. Although the species shows evidence of a slow, long-term population decline, there is low confidence in this trend. Since fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, there is no cumulative impact on this species.

Barn owl: For the 450 MW PEIR alternative, there would be an estimated 11 barn owl fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about ~~47~~ 36 fatalities per year. BCR 32 has an estimated barn owl population of 19,000 birds (Partners in Flight 2020), so the estimated annual loss is approximately 0.06% for the 450 MW PEIR alternative, or ~~0.25~~ 0.19% for the combined APWRA and MHWRA. The barn owl is an extremely widespread species in BCR 32, commonly associated with agricultural areas and structures, and its overall population is likely influenced by many factors in addition to APWRA and MHWRA wind power generation. The barn owl in BCR 32 shows evidence of a nearly constant population trend, and there is moderate confidence in this trend. Since fatalities attributable to the 450 MW repowering alternative, or to combined APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, there is no cumulative impact on this species.

Burrowing owl: The project would cause an estimated 31 burrowing owl fatalities per year (on an RSA basis; Table 5-1). For the 450 MW PEIR alternative, there would be an estimated 98 burrowing owl fatalities per year (MW basis). No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about ~~428~~ 326 fatalities per year. BCR 32 has an estimated burrowing owl population of 9,700 birds (Partners in Flight 2020), so the estimated annual loss is approximately 1.01% for the 450 MW PEIR alternative, or ~~4.4~~ 3.37% for the combined APWRA and MHWRA. Burrowing owls are particularly common in annual grassland habitats, which are typical of wind power generation in the APWRA and MHWRA, so there is a strong possibility that wind power generation is an important factor in burrowing owl population trends. The burrowing owl in BCR 32 shows evidence of a gradually declining population trend~~, although there is low confidence in this trend (U.S. Geological Survey 2020)~~. Although the U.S. Geological Survey (2020) data show low confidence in this trend, more detailed studies have clearly documented a declining trend in the Imperial Valley, which has the highest concentration of burrowing owls in BCR 32 (AECOM 2012). Considering that the RSA-based fatality estimates are approximately 20% greater than MW-based estimates, then it is likely that the 450 MW PEIR alternative is causing annual loss of approximately 1.2% of the BCR 32 population, and that APWRA and MHWRA wind power operations are causing the annual loss of approximately ~~5.3~~ 4% of the burrowing owl population. These fatalities are contributing to further declines in a species that is already uncommon in BCR 32 and is showing a long-term declining population trend; therefore, there is a cumulative impact on this species. The 450 MW PEIR alternative would contribute to burrowing owl population declines; therefore, the contribution of the 450 MW PEIR alternative would be cumulatively considerable.

Golden eagle: The golden eagle within the APWRA has been the subject of extensive field studies and modeling to ascertain its population status and its likely long-term responses to fatalities caused by wind energy developments. This work was synthesized by Hunt et al. (2017), who estimated that the annual reproductive output of 216–255 breeding pairs would have been necessary to support published estimates of 55–65 turbine-caused fatalities per year in the APWRA, concluding that the area has "a stable breeding population, but one for which any further decrease in vital rates would require immigrant floaters [subadults and nonbreeding adults] to fill territory vacancies." This estimate would indicate that the 280 territorial pairs present in the Diablo Range (Wiens et al. 2015) would likely be adequate to maintain the region's golden eagle population, but with a long-term population reduction possible if fatalities were to exceed 55–65 eagles per year. That level has not yet been attained. For the 450 MW PEIR alternative, there would be an estimated 27 golden eagle fatalities per year, while for the combined APWRA and MHWRA, there would be about ~~44~~ 40 fatalities per year. Moreover, Hunt et al. (2017) assumes that the Diablo Range eagles are a discrete population, but they acknowledge that up to 17% of radio transmitter-tagged eagles used in their study left the Diablo Range area or may have originated outside the area and migrated in. These “travelers” are predominately juvenile, subadult, or nonbreeding adult eagles, a group that also comprises a disproportionate fraction of the golden eagle mortalities in the APWRA. Thus, the eagles in the APWRA make up an anomalously small fraction of the reproductive eagles in the Diablo Range, as well as an anomalously large fraction of those eagles most likely to have come from or be migrant to areas outside the Diablo Range. The analysis area described in USFWS (2013) guidance for developing eagle conservation plans is the LAP, defined to include the population of eagles within a 109-mile radius from the project site. The LAP so defined includes all of the Diablo Range and all of the MHWRA, but also includes extensive further lands that have been modeled by the California Department of Fish and Wildlife (2016) as potential golden eagle habitat; 25% of the LAP is modeled as having high habitat suitability, 26% as medium suitability, and 12% as low suitability. The entire APWRA represents less than 0.3% of the acreage of modeled habitat within the LAP. The golden eagle population in the LAP has not been ascertained but, based on the distribution of recorded eagle occurrences within the LAP and the very extensive availability of suitable habitat, is likely to be at least ten times the population of the Diablo Range, and thus to support a population of at least 2,800 breeding pairs plus floaters. The removal of 27 eagles per year under the 450 MW PEIR alternative represents an annual loss equivalent to as much as 0.5% of the breeding population. This is possibly sufficient to drive long-term population declines. The removal of 44 eagles per year in the APWRA-MHWRA management area represents as much as 0.8% of the breeding population, and has a somewhat greater potential to drive long-term population declines. These results confirm the PEIR determination of a significant and unavoidable cumulative impact on golden eagles to which the contribution of the 450 MW alternative would be cumulatively considerable; however, the data provide no evidence of a substantial increase in the magnitude of the cumulative impact, relative to the conclusions in the PEIR.

Loggerhead shrike: For the 450 MW PEIR alternative, there would be an estimated 7 loggerhead shrike fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about ~~31~~ 24 fatalities per year. BCR 32 has an estimated loggerhead shrike population of 160,000 birds (Partners in Flight 2020), so the estimated annual loss is less than 0.01% for the 450 MW PEIR alternative, or ~~0.02%~~ approximately 0.01% for the combined APWRA and MHWRA. The loggerhead shrike is an extremely widespread species in BCR 32, and its overall population is likely influenced by many factors in addition to APWRA and MHWRA wind power generation. The loggerhead shrike in BCR 32 shows evidence of a slight long-term population decline, but there is low confidence in this trend (U.S. Geological Survey 2020). Since fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, there is no cumulative impact on this species.

Prairie falcon: For the 450 MW PEIR alternative, there would be an estimated 7 prairie falcon fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about ~~30~~ 23 fatalities per year. BCR 32 has an estimated prairie falcon population of 2,400 birds, so the estimated annual loss is approximately 0.29% for the 450 MW PEIR alternative, or ~~1.3~~ 0.96% for the combined APWRA and MHWRA. The prairie falcon in BCR 32 shows evidence of a gradually increasing population trend, and there is high confidence in this trend. Although the prairie falcon is a very widespread species in BCR 32, because the RSA-based fatality estimates are approximately 20% greater than MW-based estimates, it is likely that the 450 MW PEIR alternative is causing annual loss of approximately 0.35% of the BCR 32 prairie falcon population, and that APWRA and MHWRA wind power operations are causing the annual loss of approximately ~~1.6~~ 1.2% of the population. Numbers of this magnitude have the potential to appreciably affect the population, thus the combined effects of the APWRA and MHWRA may have the potential to cause prairie falcon population declines and therefore would result in a cumulative impact. It is unlikely, however, that the smaller losses attributable to the 450 MW PEIR alternative would have any detectable effect, therefore the contribution of the 450 MW PEIR alternative to the cumulative impact would not be cumulatively considerable.

Red-tailed hawk: For the 450 MW PEIR alternative, there would be an estimated 116 red-tailed hawk fatalities per year, and for the combined APWRA and MHWRA, there would be ~~259~~ 239 fatalities per year. BCR 32 has an estimated red-tailed hawk population of 150,000 birds, so the estimated annual loss is approximately 0.08% for the 450 MW PEIR alternative, and ~~0.17~~ 0.16% for the combined APWRA and MHWRA. The red-tailed hawk is an extremely widespread and common species in BCR 32, with overall population likely influenced by many factors in addition to APWRA and MHWRA wind power generation. Moreover, the species shows evidence of a slow, long-term population increase, and there is high confidence in this trend. Since fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, there is no cumulative impact on this species.

Swainson's hawk: Neither the project, nor the 450 MW PEIR alternative, nor wind power generation in the APWRA and MHWRA are expected to result in any Swainson's hawk fatalities. BCR 32 has an estimated Swainson's hawk population of 41,000 birds, and the Swainson's hawk in BCR 32 shows evidence of a substantial, long-term population increase; there is high confidence in this trend. Fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, have no potential to cause a cumulative impact on this species.

Tricolored blackbird: For the 450 MW PEIR alternative, there would be an estimated 9 tricolored blackbird fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about ~~39~~ 30 fatalities per year. Partners in Flight does not provide estimates of the BCR 32 tricolored blackbird population, but the latest statewide survey, performed in 2017, estimated 177,656 tricolored blackbirds in California, mostly concentrated in Central Valley counties (Meese 2017). The estimated annual loss is less than 0.01% for the 450 MW PEIR alternative, or 0.02% for the combined APWRA and MHWRA. The tricolored blackbird is an extremely widespread species in California, with overall population likely influenced by many factors in addition to APWRA and MHWRA wind power generation. The tricolored blackbird shows evidence of a long-term population decline, with a decline of over 50% since 2008, despite evidence of a slight increase between 2014 and 2017 (Meese 2017). Fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the statewide population, and have a negligible potential to cause a cumulative impact on tricolored blackbird populations.

Vaux's swift: For the 450 MW PEIR alternative, there would be an estimated 41 Vaux's swift fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about 137 fatalities per year. BCR 32 has an estimated Vaux's swift population of

5,500 birds (Partners in Flight 2020), but this is a misleading figure because the vast majority of the Vaux's swift population in North America is located within more northerly BCRs, and birds from those BCRs migrate through BCR 32. Vaux's swift is primarily a bird of the forests; most of its breeding range in California is in the coast redwood zone or the higher elevations of the Sierra Nevada (Hunter 2008), and breeding in the project area is unlikely due to the near-absence of suitable habitat, so the observed fatalities are likely accruing to migrant birds. These birds are likely migrant from BCR 5 (240,000 birds), BCR 9 (100,000 birds), are BCR 10 (67,000 birds), and thus are drawn from a breeding bird population of 407,000 birds, in addition to those birds that may breed in BCR 32. Thus, the estimated annual loss is much less than 0.1% for both the 450 MW PEIR alternative, and the combined APWRA and MHWRA; moreover, these birds are likely drawn from various different populations, depending upon the source area for birds killed during their migration. Fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the Vaux's swift population, and have a negligible potential to cause a cumulative impact on Vaux's swift populations.

White-tailed kite: For the 450 MW PEIR alternative, there would be an estimated 6 white-tailed kite fatalities per year, and for the combined APWRA and MHWRA, there would be ~~14~~ 13 fatalities per year. BCR 32 has an estimated white-tailed kite population of 9,100 birds, so the estimated annual loss is approximately 0.07% for the 450 MW PEIR alternative, or ~~0.15~~ 0.14% for the combined APWRA and MHWRA. The white-tailed kite is a widespread species in BCR 32, with overall population likely influenced by many factors in addition to APWRA and MHWRA wind power generation. The white-tailed kite in BCR 32 shows evidence of a gradually decreasing population trend, but there is low confidence in this trend. Fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, and have negligible potential to cause a cumulative impact on white-tailed kite populations.

Yellow-breasted chat: For the 450 MW PEIR alternative, there would be an estimated 5 yellow-breasted chat fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about 16 fatalities per year. BCR 32 has an estimated yellow-breasted chat population of 60,000 birds (Partners in Flight 2020), so the estimated annual loss is 0.01% for the 450 MW PEIR alternative, or 0.03% for the combined APWRA and MHWRA. The yellow-breasted chat is an extremely widespread species in BCR 32, and its overall population is likely influenced by many factors in addition to APWRA and MHWRA wind power generation. The yellow-breasted chat in BCR 32 shows evidence of a long-term population decline, with moderate confidence in this trend (U.S. Geological Survey 2020). Since fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, there is no cumulative impact on this species.

Yellow warbler: For the 450 MW PEIR alternative, there would be an estimated 20 yellow warbler fatalities per year. No estimate is available for the combined APWRA and MHWRA, but if the larger area is assumed to have the same fatality rate per MW as the repowered projects in the APWRA, then there are about 68 fatalities per year. BCR 32 has an estimated yellow warbler population of 130,000 birds (Partners in Flight 2020), so the estimated annual loss is 0.02% for the 450 MW PEIR alternative, or 0.05% for the combined APWRA and MHWRA. The yellow warbler is an extremely widespread species in BCR 32, and its overall population is likely influenced by many factors in addition to APWRA and MHWRA wind power generation. The yellow warbler in BCR 32 shows evidence of a stable long-term population trend, but there is low confidence in this trend (U.S.

Geological Survey 2020). Since fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 population, there is no cumulative impact on this species.

All raptors: For the 450 MW PEIR alternative, there would be an estimated 357 raptor fatalities per year, and for the combined APWRA and MHWRA, there would be ~~638~~ 576 fatalities per year. BCR 32 has an estimated raptor population of 913,200 birds (including only those raptor species that have been recorded as fatalities within the APWRA, as tabulated by ICF International [2016]), so the estimated annual loss is approximately 0.04% for the 450 MW PEIR alternative, and ~~0.07~~ 0.06% for the combined APWRA and MHWRA. Raptors in BCR 32 show various different long-term population trends, but all of the highly abundant species have been addressed in the foregoing analysis, excepting the great horned owl (BCR 32 population estimate 180,000), which is rarely registered as a fatality in the APWRA and has a long-term increasing population trend. Fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 raptor population, and have negligible potential to cause a cumulative impact on raptor populations.

All small birds: As previously discussed in the analysis of Impact BIO-11, most fatality surveys have substantially underestimated small bird fatality rates. This has been demonstrated by the fatality surveys at the Golden Hills and Golden Hills North sites, which used 7-day search intervals assisted by trained dogs and found much higher rates of carcass detection for small birds (and bats) than were found in any previous surveys performed in the APWRA or MHWRA. The size of the estimation error can be approximated by considering the following small bird detection rates: Buena Vista, 1.51/MW; Diablo Winds, 2.51/MW; Vasco Winds, 2.04/MW (all in Table 3.4-4); High Winds, 1.05/MW; Shiloh I, 6.75/MW; Shiloh II, 0.81/MW; Solano Wind, 0.19/MW (all in ICF International 2010). These 7 studies have a combined average detection rate of 2.23/MW. In contrast, Golden Hills and Golden Hills north have small bird detection rates of 7.59/MW and 9.44/MW for an average of 8.51/MW, which is 3.82 times as high as the average of the earlier studies. This underestimation would be shown to be even greater if an RSA basis were used instead of a MW basis, as discussed in Section 3.4, subsection Avian Fatality Analysis Methods, subsection Fatality Rates, which shows that RSA-based estimates exceed MW-based estimates by about 20%. Based on these considerations, it is likely that both APWRA and MHWRA facilities are causing small bird fatalities at a rate of between 8.5 and 10.2/MW, depending upon the correction for RSA. Accordingly, for the 450 MW PEIR alternative, there would be an estimated 3,800 to 4,600 small bird fatalities per year, and for the combined APWRA and MHWRA, there would be ~~13,500~~ 12,800 to ~~16,200~~ 15,300 per year. BCR 32 has an estimated small population of no less than 80,000,000 birds, based on the observation that the total BCR 32 estimated bird population is over 93,000,000 birds, of which fewer than 1,000,000 are raptors and nearly all of the rest are native birds that would be included in the "small bird" estimates as calculated in this analysis. The estimated annual loss is then up to 0.006% for the 450 MW PEIR alternative, and up to 0.02% for the combined APWRA and MHWRA. Birds in BCR 32 show many different long-term population trends, but even under the extremely conservative assumption that trends are generally declining, fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, are affecting an extremely small fraction of the BCR 32 small bird population, and have negligible potential to cause a cumulative impact on small bird populations.

Hoary Bats: As previously discussed in the analysis of impact BIO-14, most fatality surveys have substantially underestimated bat fatality rates. This has been demonstrated by the fatality surveys at the Golden Hills and Golden Hills North sites, which used 7-day search intervals assisted by trained dogs and found much higher rates of carcass detection for bats than were found in any previous surveys performed in the APWRA or MHWRA. The size of the estimation error can be approximated by considering the following bat detection rates: Buena Vista, 0.79/MW per year; Vasco Winds, 3.21/MW per year (both in Table 3.4-4); High Winds, 2.02/MW per year; Shiloh I, 3.92/MW per year; Shiloh II, 2.72/MW per year; Solano Wind, 1.65/MW per year (all in ICF International 2010). These 6 studies have a combined average detection rate of 2.39/MW per year. In contrast, Golden Hills and Golden Hills north have bat detection rates of 6.76/MW per year and 14.59/MW per year for an average of 10.68/MW per year, which is 4.47 times as high as in the earlier studies. It is important to note that this is a very approximate number; the wide variation between the six older sites, as well as between the two newer sites, shows that factors other than survey methodology likely play an important role in determining bat fatality rates, and those factors have not been elucidated. Nonetheless, these results plainly indicate a very substantial historical underestimation of bat fatality rates. Also, Smallwood and Bell (2019) have suggested that even the relatively high fatality rates found using frequent surveys with trained dogs may be substantially underestimating bat fatalities because of the potential for carcasses to fall far from the search area, or for mortalities to be delayed while an injured bat flies away. The underestimation would also be shown to be even greater if an RSA basis were used instead of a MW basis, as discussed in Section 3.4, subsection Avian Fatality Analysis Methods, subsection Fatality Rates, which shows that RSA-based fatality rate estimates exceed MW-based estimates by about 20%. Based on these considerations, it is likely that both APWRA and MHWRA facilities are causing bat fatalities at a rate of no less than 11/MW per year, and potentially, significantly higher. Using this rate of 11/MW per year, for the 450 MW PEIR alternative, there would be an estimated 4,950 bat fatalities per year, and for the combined APWRA and MHWRA, there would be ~~17,400~~ 16,535 per year. Based on the fatality estimates summarized in Table 5-2, those fatalities would include approximately 1,150 hoary bats per year under the 450 MW PEIR alternative and approximately ~~5,030~~ 3,841 hoary bats per year in the combined APWRA and MHWRA. Based on the detailed occurrence information summarized in Impact BIO-14, those fatalities would primarily accrue to migratory bats and would chiefly occur in August and September.

Although empirical studies of population size have not been conducted for the species, the hoary bat population has been estimated at approximately 2.5 million (Frick et al. 2017). A study in the Pacific Northwest established a high likelihood that in recent years there has been a region-wide summertime decline in the probability of hoary bat occurrence (Rodhouse et al. 2019). Fatalities from the 450 MW PEIR alternative would primarily occur during migration, when bats from numerous disparate populations may be in the vicinity of the APWRA. Hoary bat migration patterns are not well understood (Rodhouse et al. 2019), but a 2016 study of a small number of hoary bats tracked from their fall capture locations in coastal northern California for a month showed a wide variety of movement patterns ranging from one staying in the immediate vicinity the whole time; another making numerous flights of 30 to 45 miles and a third making a 600 mile trip that went into Oregon, Nevada and back into California where it was originally captured (Weller et al. 2016). Because of the lack of such studies on hoary bats in the area of the APWRA, it is unclear whether observed fatalities of mature individuals from the 450 MW PEIR alternative would contribute to the observed decline in the Northwest population, or how much of the entire hoary bat population moves through in the fall or winters in California. Although hoary bat fatalities seem to be predominantly breeding age adults, the effects of the 450 MW PEIR alternative would accrue to what is assumed to be a very large bat population and would thus affect potentially only a small fraction of the hoary bat population. Despite this, assumptions of low intrinsic growth rate in the bat population could lead to extinction risk, even in response to low mortality rates. For example, if the potential bat population growth rate were 1.5% per year, a population of 2.5 million bats could suffer a potential 90% decline over a 50-year period as a consequence of wind turbine mortality (Frick et al. 2017). The possibility of an APWRA and MHWRA combined mortality of 5,030 bats per year represents 0.16% of a population of 2.5 million bats. However, the affected population is almost certainly smaller than 2.5 million. Some fraction of those bats are from the eastern U.S. and Canada, for instance. Even a change of 0.16% per year is a substantial impact on an animal with a population growth rate of only 1.5% per year, and the impact is greater if the affected population is smaller than 2.5 million bats. These fatalities are contributing to declines in a species that is already declining in the Pacific Northwest and may be declining in California; therefore, there is a cumulative impact. The impacts are large enough to cause or contribute to a long-term declining population trend. Wind power generation at APWRA and MHWRA are large enough to cause or contribute to a long-term declining population trend. The same conclusion applies, with lower confidence, to the 450 MW PEIR alternative; therefore, the contribution of this alternative to the cumulative impact is cumulatively considerable.

Mexican free-tailed bats: The analysis of cumulative effects of the proposed project on the Mexican free-tailed bat is analogous to the analysis of potential cumulative effects on birds, but substantially less information is available, and information on bat population status in particular is very limited. Based on the fatality estimates summarized in Table 5-2, approximately 71% of total bat fatalities would represent Mexican free-tailed bats, i.e. approximately 3,400 bats per year under the 450 MW PEIR alternative and approximately ~~10,900~~ 11,350 bats per year in the combined APWRA and MHWRA. Based on the detailed occurrence information summarized in Impact BIO-14, those fatalities would primarily accrue to migratory bats and would chiefly occur in August and September. The Mexican free-tailed bat is an enormously widespread bat, occurring from Oregon to the Falkland Islands east of Argentina, and in some areas it has individual colonies containing millions of bats. Rangewide, its status is stable (Barquez et al. 2015). No declines of this species have been documented in California and it appears to be both widespread and abundant. It is therefore likely that its population dynamics are primarily responsive to factors other than wind power generation, such as prey availability or year-to-year climate variability. Fatalities attributable to the 450 MW repowering alternative, or to APWRA and MHWRA wind power operations, likely affect an extremely small fraction of the statewide population, and have an extremely small potential to cumulatively impact Mexican free-tailed bat populations; therefore, there is no cumulative impact on this species.

PEIR Analysis: Other Biological Resources

The geographic scope considered for potential cumulative impacts on other biological resources in the PEIR was the larger habitat area related to impacted species. Construction-related impacts, which would largely pertain to disturbance and potential loss of land cover types and the associated effects on special-status terrestrial species, were considered in the context of the northern Diablo Range.

The PEIR found that implementation of the 450 MW program alternative would result in the permanent loss of vegetation and wetlands. The PEIR determined that each project implemented under the program would be required to mitigate losses of vegetation and wetlands, resulting in no net loss, and thereby reducing any contribution to cumulative impacts to a less-than significant level.

The PEIR determined that implementation of the 450 MW program alternative could result in the injury, mortality, or disturbance of special-status and common wildlife species during construction, with the potential to affect local populations. Implementation of mitigation measures identified in the PEIR would minimize or avoid injury, mortality, or disturbance of special-status and common species during construction and would avoid or reduce the program's contribution to cumulative effects on local populations. The program would result in the permanent and temporary losses of land cover types that provide suitable habitat for special-status and common wildlife species. The loss of these habitats would contribute to impacts of other projects that remove these habitats in the program region. However, permanent disturbance of undeveloped land would be offset by restoration of habitat when existing roads and turbine pads and foundations are restored to natural conditions. With this offset, and with implementation of mitigation measures identified in the PEIR that require restoration of temporarily affected habitat and compensation for the permanent loss of habitat, the program's contribution to certain cumulative impacts on habitats and terrestrial species would be reduced.

Project Analysis: Avian and Bat Mortality

As determined in *PEIR Analysis: Avian and Bat Mortality*, cumulative impacts would affect the burrowing owl, golden eagle, and hoary bat. The following analysis discusses whether the proposed project would make a cumulatively considerable contribution to those impacts.

Burrowing owl: The foregoing analysis found that that because APWRA and MHWRA wind power operations are likely causing annual loss of approximately 5.3% of the BCR 32 population, and that since these fatalities are contributing to further declines in a species that is already uncommon in BCR 32 and is showing a long-term declining population trend, there is a cumulative impact on this species. The portion of the population change attributable to the proposed project is approximately 0.25% of the BCR 32 population (annually), which is an immeasurably small fraction. Thus the proposed project would not make a cumulatively considerable contribution to the cumulative impact.

Golden eagle: The foregoing analysis found that APWRA and MHWRA wind power operations have the potential to drive long-term population declines, therefore there would be a cumulative impact on this species. The removal of 27 eagles per year under the 450 MW PEIR alternative represents an annual loss equivalent to as much as 0.5% of the breeding population, which in itself is possibly sufficient to drive long-term population declines and therefore the contribution of the 450 MW PEIR alternative to this cumulative impact is cumulatively considerable. However, this is also such a small fraction that it would be nearly impossible to measure the effect, except for the fact that this species is closely studied in the Diablo Range and there are thus estimates not only of replacement by fledging of chicks, but also of immigration and emigration between the Diablo Range and the larger LAP. Provided that the golden eagle population in the Diablo Range continues to be closely monitored, it is likely that fatalities associated with the proposed project will likewise make a considerable contribution to cumulative effects on the golden eagle. However, since those impacts would be within the scope of the 450 MW PEIR alternative, there would be no substantial increase in the magnitude of the cumulative impact, relative to the conclusions in the PEIR.

Hoary Bats: The foregoing analysis found that APWRA and MHWRA wind operations are contributing to declines in this species that is already declining in the Pacific Northwest and may be declining in California, therefore resulting in a cumulative impact. The analysis further found that the 450 MW PEIR alternative makes a cumulatively significant contribution to hoary bat population declines. The proposed project makes a smaller contribution, amounting to 18% of the contribution under the 450 MW alternative, and therefore there is less confidence that the contribution of the proposed project to a cumulative impact on this species is cumulatively considerable. If the hoary bat population affected by the project is a random or representative sample from the approximately 2.5 million hoary bats in western North America, then a cumulatively significant contribution is unlikely. However, if the affected bats are drawn from a smaller population, e.g., hoary bats in California, then there is a greater likelihood of a cumulatively significant contribution from the project. At this time population data on hoary bats is very limited, and the latter possibility represents a conservative assessment of the risk; therefore, the contribution of the proposed project to the cumulative impact on this species is cumulatively considerable.

Conclusion: The project would result in a significant and unavoidable cumulative impact on avian and bat mortality associated with turbine operations. For the burrowing owl and the golden eagle, the project contribution is not cumulatively considerable, but for hoary bats, it is cumulatively considerable because the impact is larger than estimated in the PEIR. There is limited confidence in this conclusion, however, due to the high level of uncertainty regarding hoary bat population status.

Project Analysis: Other Biological Resources

The project could result in the injury, mortality, or disturbance of special-status and common wildlife species during construction, with the potential to affect local populations. Implementation of mitigation measures identified in the PEIR, and as updated in some circumstances based on 2020 conditions, would minimize or avoid injury, mortality, or disturbance of special-status and common species during construction and would avoid or reduce the project's contribution to cumulative effects on local populations. The project would result in the permanent and temporary losses of land cover types that provide suitable habitat for special-status and common wildlife species. The loss of these habitats would contribute to impacts of other projects that remove these habitats in the program region. However, permanent disturbance of undeveloped land would be offset by restoration of habitat when existing roads and turbine pads and foundations are restored to natural conditions. With this offset, and with implementation of mitigation measures identified in Section 3.4 that require restoration of temporarily affected habitat and compensation for the permanent loss of habitat, the project's contribution to certain cumulative impacts on habitats and terrestrial species would be reduced.

Cultural Resources

PEIR Analysis

The geographic scope considered for potential cumulative impacts on cultural resources in the PEIR was the program area and the immediate vicinity. The PEIR found that simultaneous construction of multiple repowering projects in the program area and other development and infrastructure projects in the vicinity of the program area could result in significant impacts on historic resources, archaeological resources, and human remains, should they be present. However, implementation of mitigation measures identified in the PEIR would ensure that impacts would not be such that they would result in or contribute to a cumulative impact.

Project Analysis

The characteristics of the proposed project with respect to construction activities and views during operation would be consistent with the evaluation of the project site in the PEIR. Therefore, as described in the preceding section, no cumulative impact on cultural resources would occur.

Geology, Soils, and Paleontological Resources

PEIR Analysis

Impacts related to geology, soils, and paleontological resources are generally site-specific and depend on past, present, and future uses as well as existing soil and sediment conditions. Therefore, the geographic scope related the PEIR cumulative geology, soils, and paleontological resources was limited to the program area and the immediate vicinity. The PEIR analysis found that the program would contribute less-than-significant impacts related to soil erosion or the loss of topsoil. The PEIR concluded that while the program could result in risks to life or property related to development on a site with active geologic and soil conditions there, implementation of PEIR Mitigation Measure GEO-1, which requires a site-specific geotechnical investigation and implementation of design recommendations from subsequent geotechnical report impacts related to geology and soils would be minimized and/or avoided. Therefore, the PEIR determined that the program's incremental, less-than-significant impacts related to geology and soils would not result in a cumulative impact. Simultaneous construction of multiple repowering projects in the program area and other development and infrastructure projects in the vicinity of the program area could potentially result in significant impacts on paleontological resources, should they be present within the program area or the vicinity of the program area. However, implementation of the mitigation measures to protect paleontological resources identified in the PEIR would ensure that project impacts would not be such that they would result in or contribute to a cumulative impact.

Project Analysis

The characteristics of the proposed project with respect to construction activities and operation would be consistent with the evaluation of the project site in the PEIR. Therefore, as described in the preceding section, no cumulative impact on geology, soils, and paleontological resources would occur.

Greenhouse Gas Emissions

PEIR Analysis

Greenhouse gas (GHG) emissions are inherently a cumulative concern, in that the significance of GHG emissions is determined based on whether such emissions would contribute to global climate change. Although the geographic scope of cumulative impacts related to GHG emissions is global, the PEIR analysis focused on the state and region, and the program's direct and/or indirect generation or offset of GHG emissions. Continued GHG emissions from existing and future development and transportation uses within the state and region are expected to continue to exacerbate global climate change, resulting in a cumulative impact. The program, the Golden Hills Project, and the Patterson Pass Project were determined to result in a long-term net reduction of approximately 96,049 metric tons of carbon dioxide equivalent (CO_2e) per year, 18,727 metric tons of CO_2e per year, and 6,204 metric tons of CO_2e per year, respectively, and would thus not conflict with the state's GHG reduction goals. Therefore, the PEIR would result in a long-term net reduction in CO_2e, and therefore the contribution of the program alternative to cumulative impacts would not be cumulatively considerable.

Project Analysis

Wind energy generated by the project would reduce GHG emissions by approximately 26,006 metric tons CO_2e during its first year of operation. This reduction is found to more than offset emissions generated by project construction and operation. In addition, the project was found to comply with plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs with mitigation (see Impact GHG-2, PEIR Mitigation Measure GHG-2a, GHG-2b, GHG-2c, and GHG-2d). As addressed above under the GHG *PEIR Analysis*, program implementation would result in a long-term net reduction in CO_2e. Because the both the program and the project would contribute to a long-term net reduction in CO_2e, and because each would implement mitigation to reduce impacts on policy compliance to less than significant, the contribution of the project to cumulative impacts would not be cumulatively considerable.

Hazards and Hazardous Materials

PEIR Analysis

Impacts related to hazards and hazardous materials are generally site-specific and depend on past, present, and future uses as well as existing soil and sediment conditions. Therefore, the geographic scope related to the PEIR cumulative hazards and hazardous materials impacts is limited to the program area. With respect to wildland fires risk, the PEIR expanded this boundary and included the high fire hazard areas in which access and haul roads would be shared throughout the APWRA and other projects constructed at the same time. This area includes the following existing windfarms: Golden Hills Project, Patterson Pass, Summit, AWI, Vasco, FloDesign Wind Turbine Corp, the proposed Mariposa Energy Center and Cool Earth Solar Energy Facility near Mountain House.

The PEIR analysis found that the program would contribute less-than-significant impacts related to accidental releases of hazardous materials; interference with air navigation; or flammable or combustible materials. It also found no evidence of existing subsurface conditions that would potentially contribute to cumulative impacts relating to hazards and hazardous materials. The PEIR concluded that there were no records indicating either contaminated sites or hazardous substances were in proposed disturbed areas. Finally, the program and all cumulative projects would be required to adhere to regulations that govern hazardous materials storage and handling, water quality best management practices, Federal Aviation Administration regulations related to airspace, and fire prevention and management. Together, these measures would ensure that impacts related to exposure to hazardous materials would be minimized and/or avoided. Therefore, the PEIR determined that there would be no cumulative impact.

Project Analysis

. The characteristics of the proposed project with respect to construction activities and operation would be consistent with the evaluation of the project area in the PEIR. Therefore, as described in the preceding section, no cumulative impact would occur.

Hydrology and Water Quality

PEIR Analysis

The geographic scope considered for potential cumulative impacts on hydrology and water quality in the PEIR was the program area. PEIR Mitigation Measure WQ-1 would ensure that through compliance with the National Pollution Discharge Elimination System, all impacts related to hydrology and water quality would be reduced to less than significant. Furthermore, other projects in the same watersheds would also be required to comply with NPDES requirements. Therefore, a cumulative impact would not occur.

Project Analysis

The characteristics of the proposed project with respect to construction activities and operation would be consistent with the evaluation of the project site in the PEIR. Therefore, as described in the preceding section, no cumulative impact on hydrology or water quality would occur.

Noise

PEIR Analysis

The geographic scope for the PEIR cumulative noise analysis considered the construction and operation of other repowering projects in the program area vicinity that could cumulatively contribute to the ambient noise environment at the existing residences near the existing and proposed turbine sites in the program area. For construction noise impacts, the analysis considered the cumulative impacts at existing residences near the construction activities from construction of multiple repowering projects simultaneously in the program area. Because noise diminishes rapidly with distance (6 A-weighted decibels per doubling of distance for point sources), the noise analysis evaluated impacts at existing residences in areas immediately surrounding the project turbine sites and construction activities.

The PEIR cumulative analysis found that modern turbines are expected to have several characteristics that reduce aerodynamic sound levels and make for quieter operations than the existing turbines. The modern turbines are expected to have relatively low rotational speeds and pitch control on the rotors, both of which reduce sound levels. Nonetheless, the analysis indicated that there was potential for repowering projects to result in noise that exceeds County noise standards which would result in significant cumulative operational noise impacts. Implementation of PEIR Mitigation Measure NOI-1, however, would ensure compliance with County noise standards and would avoid significant cumulative operational noise impacts. Construction of multiple repowering projects simultaneously in the program area could potentially result in a cumulative construction noise impact at residences located near the construction activities. However, the impact would be temporary and localized and implementation of PEIR Mitigation Measure NOI-2 would avoid cumulative impacts related to construction noise.

Project Analysis

The characteristics of the proposed project with respect to construction and operation related noise would be consistent with the evaluation of the project site in the PEIR. Therefore, as described in the preceding section, no cumulative impact would occur.

Transportation

PEIR Analysis

The PEIR cumulative transportation analysis considered other projects in the program area vicinity that would involve concurrent construction activities and that could use the same access roadways to project sites. The cumulative construction impacts on traffic operation, safety hazards, emergency access, and bicycle facilities were found to be significant. However, the PEIR concluded that implementation of Mitigation Measure TRA-1 would reduce the program's cumulative contribution to the significant impact. In addition, the PEIR concluded that any proposed repowering projects with the construction activities taking place concurrently with construction of a repowering project at the location of the Sand Hill project site would contribute to a significant and unavoidable cumulative impact on traffic operation, safety hazards, emergency access, and bicycle facilities on the roadway and bicycle facilities in the vicinity. Therefore, the PEIR found potentially significant and unavoidable cumulative impacts to transportation.

Project Analysis

Similar to the PEIR, the project cumulative transportation analysis considers other projects in the program area vicinity that would involve construction activities concurrent with those of the proposed project and that could use the same access roadways to project site. The project transportation analysis concludes that with implementation of PEIR Mitigation Measure TRA-1, all transportation impacts would be reduced to a less-than-significant level. Based on the relatively general information that was known at the time that the PEIR was prepared, the PEIR concluded that any repowering project with construction activities occurring concurrent with that of the Sand Hill Repowering Project site would result in a cumulatively considerable contribution to a cumulative traffic impact. Construction of the proposed project could occur concurrently with the Sand Hill Repowering Project; however, the Sand Hill Repowering Project as currently defined is smaller in scale and capacity than it was described in the PEIR. Furthermore, construction traffic associated with the proposed project would not share local roads with construction equipment that would be required for the Sand Hill Repowering Project, and any construction-related freeway traffic would use different off- and on-ramps. Therefore, the project would not make a cumulatively considerable contribution to the cumulative traffic impact previously identified in the PEIR.

Topics not Assessed Separately in the PEIR

The following topics were not assessed separately in the PEIR: energy, tribal cultural resources, and wildfire. This section evaluates the potential for cumulative impacts associated with those resources and whether the project would make a cumulatively considerable contribution to cumulative impacts.

Energy

Section 3.6, *Energy*, of this SEIR determined the project would generate no impact related to conflicting with or obstructing a state or local plan for renewable energy or energy efficiency. Project construction, which would be a short-term impact, would be reduced to less than significant by PEIR Mitigation Measure AQ-2a and AQ-2b. The residual impact related to energy use by construction equipment would be small, and would be far outweighed by the energy production of the repowered facilities described in the PEIR. No cumulative impact associated with the program or the project would occur.

Tribal Cultural Resources

Section 3.17, *Tribal Cultural Resources*, of this SEIR concluded that there are no tribal cultural resources in or near the program area or the project site. Because there would be no impact on tribal cultural resources, the program and the project would not result in or contribute to a cumulative impact.

Wildfire

Wildfire was addressed in the PEIR as a part of the assessment of PEIR Section 3.9 *Hazards and Hazardous Materials* impacts, and the cumulative impacts analysis for this topic was determined to be less than significant (described above). Impacts associated with the exacerbation of wildfire risk were not discussed in the PEIR, but are discussed in SEIR Section 3.19, *Wildfire,* and were found to be less than significant. Although the program and project site are located in areas designated between moderate and very high fire hazard severity zones, the program area includes a network of maintenance and fire roads that can be utilized by the California Department of Forestry and Fire Prevention and the Alameda County Fire Department to rapidly access and suppress any fires that may arise in the program area. Furthermore, repowered wind turbines associated with the program have improved upon older models in terms of fire ignition risk and are anticipated to result in a reduction of potential fire ignitions compared to non-repowered conditions. Lastly, repowering projects must comply with the *Altamont Pass Wind Farms Fire Requirements* as described in Exhibit C of the 2005 Conditional Use Permits, which would also reduce fire risk, and construction activities associated with repowering projects must follow Occupational Safety and Health Administration requirements regarding the safe control and storage of combustible materials. Therefore, a cumulative impact associated with wildfire risk would not occur.

5.3 Growth-Inducing Impacts

Section 21100(b)(5) of CEQA requires an EIR to discuss how a project, if implemented, may induce growth and the impacts of that induced growth (see also CEQA Guidelines Section 15126). CEQA requires the EIR to discuss specifically "the ways in which the project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment" (CEQA Guidelines Section 15126.2[d]). The CEQA Guidelines do not provide specific criteria for evaluating growth inducement and state that growth in any area is "necessarily beneficial, detrimental, or of little significance to the environment." CEQA does not require separate mitigation for growth inducement as it is assumed that these impacts are already captured in the analysis of environmental impacts (see Chapter 3, *Impact Analysis*). Furthermore, the CEQA Guidelines require that an EIR "discuss the ways" a project could be growth inducing and to "discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment."

According to the CEQA Guidelines, a project would have potential to induce growth if it would result in either of the following.

- Remove obstacles to population growth (e.g., through the expansion of public services into an area that does not currently receive these services), or through the provision of new access to an area, or a change in a restrictive zoning or General Plan land use designation.
- Result in economic expansion and population growth through employment opportunities and/or construction of new housing.

In general, a project could be considered growth-inducing if it directly or indirectly affects the ability of agencies to provide needed public services, or if it can be demonstrated that the potential growth significantly affects the environment in some other way. However, the CEQA Guidelines do not require a prediction or speculation of where, when, and in what form such growth would occur (CEQA Guidelines Section 15145).

PEIR Section 5.2 provided a detailed description of the potential growth-inducing impacts of the program. The conclusion of the PEIR was that the program would not be expected to indirectly induce population growth through the construction of new service roads or electrical infrastructure and that the employment opportunities provided by program construction are not anticipated to induce indirect growth in the region. The analysis in Section 5.2 of the PEIR is incorporated here by reference. Similar to the findings of the PEIR regarding the two projects analyzed in that document, the Mulqueeney Ranch Repowering Project's potential for growth inducement would be similar to the program but of a smaller scale. Therefore, the project would not be expected to indirectly induce population growth through the construction of new service roads or electrical infrastructure and the employment opportunities provided by project construction are not anticipated to induce indirect growth in the region.

5.4 Significant and Unavoidable Impacts

Section 21067 of CEQA and Sections 15126(b) and 15126.2(b) of the CEQA Guidelines require that an EIR describe any significant impacts, including those that can be mitigated but not reduced to a less-than-significant level. Furthermore, where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should also be described.

5.4.1 Program Impacts

PEIR Section 5.1 identified the following significant and unavoidable impacts.

- Air Quality: Construction emissions of ROG and NO_X for the program would exceed the BAAQMD thresholds after implementation of Mitigation Measures AQ-1 and AQ-2, (Table 3.3-11); accordingly, cumulative construction impacts would be significant and unavoidable. For the Golden Hills and Patterson Pass projects individually, construction emissions of NO_X would exceed the BAAQMD thresholds after implementation of Mitigation Measures AQ-1 and AQ-2 (Tables 3.3-16 and 3.3-21); accordingly, cumulative construction impacts would be significant and unavoidable.
- Biological Resources: Operation of the either of the program alternatives, as well as the Golden Hills and Patterson Pass projects considered separately, would result in turbine-related mortality of raptors, other birds, and bats migrating through and wintering in the program area. Although mitigation can reduce these impacts, the likelihood of ongoing turbine-related mortality would constitute a significant and unavoidable impact.
- Cumulative Traffic Impacts: cumulative impacts on traffic operation, safety hazards, emergency access, and bicycle facilities could result from program and project construction activities if they take place concurrently with construction of the Sand Hill Repowering Project, which has been identified as resulting in a significant and unavoidable traffic impact.

5.4.2 Project Impacts

This SEIR identifies the following significant and unavoidable impacts for the proposed project.

5.4.2.1 Biological Resources

- Impact BIO-11: Avian mortality resulting from interaction with wind energy facilities
- Impact BIO-14: Turbine-related fatalities of special-status and other bats
- Impact BIO-19: Potential impact on the movement of any native resident or migratory wildlife species or established native resident or migratory wildlife corridors, and the use of native wildlife nursery sites

5.4.2.2 Cumulative Impacts

- Air Quality: Construction emissions of ROG and NO_X for the program would exceed the BAAQMD thresholds after implementation of Mitigation Measures AQ-1 and AQ-2, (Table 3.3-11); accordingly, cumulative construction impacts would be significant and unavoidable. Although the project would generate ROG and NO_X below the BAAQMD threshold (see Impact AQ-2, PEIR Mitigation Measures AQ-2a and AQ-2b, and 2020 NEW Mitigation Measure AQ-2c), the project-generated ROG and NO_X emissions would result in a cumulatively considerable contribution to the cumulative impact identified in the PEIR. This would be a significant and unavoidable impact.
- Biological Resources: Operation of the project would result in turbine-related mortality of raptors, other birds, and bats migrating through and wintering in the project site and larger program area. Although mitigation can reduce these impacts, the likelihood of ongoing turbine-related mortality would constitute a project-level significant and unavoidable impact. Considered with other sources of avian mortality (e.g., the Contra Costa County portion of the APWRA and the neighboring MHWRA), project-related mortality of golden eagle, burrowing owl, and hoary bat would constitute a cumulatively considerable contribution to a cumulative impact on these species. This would be a significant and unavoidable impact.

5.5 Significant Irreversible Environmental Changes

CEQA Guidelines Section 15126.2(c) requires that an EIR discuss any environmental changes that would be irreversible if a project were implemented. CEQA defines irreversible environmental changes as the irretrievable commitment of resources and/or irreversible damage resulting from environmental accidents. Irreversible changes may include current or future uses of non-renewable resources, and secondary or growth inducing impacts that commit future generations to similar uses. The CEQA Guidelines describe three distinct categories of significant irreversible changes, including changes in land use that would commit future generations to specific uses; irreversible changes from environmental actions; and consumption of nonrenewable resources.

5.5.1 Changes in Land Use Which Would Commit Future Generations

The program area and the project site, which falls within the program area, are located in eastern Alameda County. The area is currently the location of extensive wind farm development. The *East County Area Plan* (ECAP) designates the entire program area as Large Parcel Agriculture. According to the ECAP, a wind farm is a permitted use with a Conditional Use Permit. The program and the project would not commit future generations to or introduce changes in land use that would vary from the existing conditions.

5.5.2 Irreversible Changes from Environmental Actions

The PEIR found that the program involved the construction and repowering of existing wind farms on approximately 50,000 acres in unincorporated eastern Alameda County, and that the commitment of nonrenewable resources, such as sand, gravel and other components of cement, metals and fossil fuels, necessary for construction and operation of the repowered wind farms would be irreversible. The project would similarly commit such materials for construction and operation of the repowered wind farm, although on much a smaller scale, but also an irreversible commitment.

5.5.3 Consumption of Nonrenewable Resources

The PEIR found that construction of repowered wind farms would require the consumption of nonrenewable resources, such as fuel for construction vehicles and equipment. However, such use would be limited to the short-term construction period.

Operation and maintenance of the project would not increase the use of nonrenewable resources relative to existing conditions. The temporary, construction-related increase would not result in significant use of nonrenewable resources and would not commit future generations to similar uses. Moreover, the primary objective of the project is to provide an economically viable source of clean, renewable electricity generation that meets California's growing demand for power and fulfills numerous state and national renewable energy policies. The intent is to specifically reduce consumption of non-renewable sources of energy such as coal, natural gas, and other hydrocarbon-based fuels.

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