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PACIFIC GAS AND ELECTRIC COMPANY BAY AREA OPERATIONS & MAINTENANCE INCIDENTAL TAKE PERMIT ENVIRONMENTAL IMPACT REPORT

VOLUME 2. FINAL EIR

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Acronyms and Abbreviations

µg/m ³	micrograms per cubic meter
AB 52	Assembly Bill 52
ABAG	Association of Bay Area Governments
AC	alternating current
ACWD	Alameda County Water District
Air Toxics	AT
AMMs	avoidance and minimization measures
APM	Applicant Proposed Measure
APP	Avian Protection Plan
ARPA	Archaeological Resource Protection Act
ATVs	all-terrain vehicles
BAAQMD	Bay Area Air Quality Management District
BACT	best available control technologies
BAHCP	Bay Area HCP
BARWRP	Bay Area Regional Water Recycling Program
Bay Area	San Francisco Bay Area
Bay Area O&M HCP	Bay Area Operations & Maintenance Habitat Conservation Plan
BCDC	San Francisco Bay Conservation and Development Commission
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
BNSF	Burlington Northern Santa Fe
C&D	construction and demolition
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Safety and Health Administration
CALFIRE	California Department of Forestry and Fire Protection
Cal-Fire	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CARB	California Air Resources Board
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH ₄	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
Clean Power Plan	Mandatory Reporting Rule and Clean Power Plan

CLG	Certified Local Government Program
CMA	Congestion Management Agency
CNDDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
Coastal Act	California Coastal Act
CONPLAN	Concept of Operations Plan
covered species	California tiger salamander, Alameda whipsnake, and California freshwater shrimp
CPS	cathodic protection system
CPSI	Community Pipeline Safety Initiative
CPUC	California Public Utilities Commission
CPUs	cathodic protection units
CRCR	Cultural Resources Constraints Report
CRHR	California Register of Historical Resources
CRS	cultural resource specialist
CWA	Clean Water Act
dBA	A- weighted dB scale
DDT	Dichlorodiphenyltrichloroethane
Delta	Sacramento–San Joaquin Delta
DOC	California Department of Conservation
DOT	Department of Transportation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ERTC	Environmental Release to Construction
ETS	Electric Test System
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FESA	federal Endangered Species Act
FIRM	Flood Insurance Rate Map
FPs	Field Protocols
GHG	greenhouse gas
GIS	geographic information system
GO	General Order
GPS	Global Positioning System
HA	Hydrologic Area
HAS	Hydrologic Subarea
HCP	Habitat Conservation Plan
HFCs	hydroflourocarbons
HI	hazard index

HMMP	Hazardous Materials Management Plan
HSAA	Hazardous Substance Account Act
HWCL	Hazardous Waste Control Law
in/sec	inches per second
ITP	Incidental Take Permit
kV	kilovolt
LCP	Local Coastal Program
L _{eq}	equivalent sound level
LID	low impact development
L _{max}	maximum noise level
L _{min}	minimum sound levels
LRAs	Local Responsibility Areas
LSAA	Lake or Streambed Alteration Agreement
MBTA	Migratory Bird Treaty Act
MEI	maximum exposed individual
MFL	magnetic flux leakage
MLRA	major land resource area
MMWD	Marin Municipal Water District
mph	miles per hour
MRZ	Mineral Resource Zone
MS4s	municipal separate storm sewer systems
MTC	Metropolitan Transportation Commission
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCAB	North Coast Air Basin
NCP	National Contingency Plan
NERC	North American Reliability Corporation
NFIP	National Flood Insurance Program
NO	nitric oxide
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration's National Marine Fisheries Service
NOP	Notice of Preparation
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSCAPCD	Northern Sonoma County Air Pollution Control District
NSR	new source review
NWP	Nationwide Permit
O&M	operations and maintenance
OAK	Oakland International Airport
OEHHHA	Office of Environmental Health Hazard Assessment

OES	California Office of Emergency Services
OMR	Department of Conservation's Office of Mine Reclamation
OSHA	Occupational Safety and Health Administration
PCP	Pentachlorophenol
PFCs	perfluorocarbons
PG&E	Pacific Gas and Electric Company
pig	pipeline inspection gauge
PLS	pressure limiting station
PM ₁₀	PM less than or equal to 10 microns in diameter
PM _{2.5}	PM 2.5 microns in diameter or less
ppm	parts per million
PPV	peak particle velocity
psi	pounds per square inch
PTC	Permit to Construct
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act of 1976
RECP	Regional Emergency Coordination Plan
ROGs	reactive organic gases
ROW	right-of-way
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
RWS	Regional Water System
SCADA	Supervisory Controlled and Data Acquisition
Scoping Plan	California's 2017 Climate Change Scoping Plan
SCVWD	Santa Clara Valley Water District
SF ₆	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFHAs	special flood hazard areas
SFO	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SIP	State Implementation Plan
SJC	Norman Y. Mineta San Jose International Airport
SMARA	Surface Mining and Reclamation Act
SMGB	State Mining and Geology Board
SO ₂	sulfur dioxide
SRAs	State Responsibility Areas
SRs	State Routes
SSC	Species of Special Concern
Statewide Natural Gas Utility Permit	Notice of Applicability to PG&E that the Statewide General Order for Discharges from Natural Gas Utility Construction, Operation, and Maintenance Activities
STS	Charles M. Schulz Sonoma County Airport
SUVs	sport utility vehicles
SVAB	Sacramento Valley Air Basin
SWDA	Solid Waste Disposal Act
SWP	State Water Project

SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
Tanner Act	Toxic Air Contaminant Identification and Control Act
TCR	Tribal Cultural Resources
TMDL	Total maximum daily load
TPZ	timberland preserve zones
TSCA	Toxic Substances Control Act
TSPs	tubular steel poles
TVMP	Transmission Vegetation Management Plan
U.S.	United States
Unified Program	Unified Hazardous Waste and Hazardous Materials Management Regulatory Program
UP	Union Pacific
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USFWS	U.S Fish and Wildlife Service
VOCs	Volatile organic compounds
YSAQMD	Yolo-Solano Air Quality Management District

Executive Summary

Introduction

Pacific Gas and Electric Company (PG&E) has filed an application for an Incidental Take Permit (ITP) under Section 2081 of the California Endangered Species Act (CESA) with the California Department of Fish and Wildlife (CDFW). The ITP would cover PG&E's San Francisco Bay Area (Bay Area) Operations and Maintenance (O&M) and minor new construction activities for its natural gas and electric lines, and establish a comprehensive approach to avoid, minimize, and fully mitigate impacts on covered species and habitat (collectively "covered activities"). CDFW has directed preparation of this Bay Area O&M Incidental Take Permit Environmental Impact Report (EIR) in conformance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.) and the CEQA Guidelines (14 California Code of Regulations, Section 15000 et seq.).

For purposes of CEQA, the proposed project consists of the ITP, which would condition and provide incidental take coverage for the covered activities to the extent that they could result in impacts to three species, the California tiger salamander, Alameda whipsnake, and California freshwater shrimp (covered species). In addition, as a Trustee Agency, CDFW has jurisdiction by law over natural resources affected by the ITP that are held in trust for the people of the State of California. CDFW is the trustee agency with regard to the fish and wildlife of the state, designated rare or endangered native plants, and game refuges, ecological reserves, and other areas administered by CDFW. The duration of the ITP would be 30 years. PG&E's covered activities for which CDFW is issuing an ITP (proposed Project). The ITP will provide incidental take coverage for three species, the California tiger salamander, Alameda whipsnake, and California freshwater shrimp (covered species), in the Bay Area for the next 30 years.

The activities covered in the ITP are essential to support PG&E's obligation to provide safe and reliable energy to customers throughout the Bay Area. Much of the work included in the covered activities is specifically aimed at making PG&E's gas and electric systems more resilient and resistant to risks such as wildfires and earthquakes, while all covered activities will make the gas and electric systems safer and more reliable.

Project Location

The geographic scope of the proposed ~~Project~~ project encompasses Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, and Solano Counties; collectively this area is known as the *study area*. Within those nine counties, the *Permit Area* consists of PG&E gas and electric transmission and distribution facilities, rights-of-way (ROWs), certain land adjacent to ROWs plus standard buffers, lands owned or obtained by PG&E or subject to PG&E easements, access routes, and conservation areas acquired to provide compensatory mitigation for impacts resulting from covered activities. The total Permit Area encompasses approximately 402,440 acres.¹

¹ This number and the percentages and acreages of existing conditions shown throughout the EIR are approximate and based on conditions as described in PG&E's Bay Area O&M HCP. Over the next 30 years, changes will occur due to land use and regulatory changes, new construction, acquisition of additional utility property and habitat lands, and other factors.

PG&E ROWs and facilities in the Permit Area are located in the following land-cover types: urban (approximately 61%), natural (approximately 32%) and agricultural (approximately 7%). The estimated acreage of habitat for the three ITP-covered species within the Permit Area is substantially smaller:

- California tiger salamander habitat—approximately 43,500 acres
- Alameda whipsnake habitat—approximately 10,800 acres
- California freshwater shrimp habitat—approximately 100 acres

Activity and project O&M and minor new construction locations vary year to year based on maintenance schedules, changes in maintenance priority, and the need to respond to emergencies. As a result, work may be implemented anywhere in the Permit Area. O&M and minor new construction work are expected to be performed throughout PG&E's ROW and in close proximity to the ROW over the course of the 30-year permit term. Activities on habitat conservation lands would also be covered.

Project Overview

PG&E applied for an ITP to streamline the incidental take permitting for three species in the Permit Area within the nine-county Bay Area region for its ongoing natural gas and electric O&M activities, minor new construction, and habitat conservation and enhancement activities. The ITP would cover California tiger salamander and Alameda whipsnake, which are listed as threatened under CESA, and California freshwater shrimp, which is listed under CESA as endangered.

Covered activities under the ITP would consist of O&M of PG&E's gas and electrical transmission and distribution systems, minor new construction, and habitat conservation and enhancement. PG&E has conducted O&M activities in the Bay Area for decades. CDFW's issuance of the ITP would not change the nature and extent of the work that will be required within the next 30 years on PG&E's natural gas and electric systems in the Bay Area, but it would eliminate the need for PG&E to obtain incidental take authorization on a case by case basis when implementing covered activities likely to cause take of the covered species. The ITP would establish standardized avoidance and minimization measures, which would shape the way PG&E carries out covered activities, and provide a comprehensive approach to habitat conservation that enables landscape-level habitat preservation and enhancement that is more ecologically beneficial. The ITP's comprehensive approach to compensatory mitigation would result in more comprehensive habitat conservation than would otherwise occur over the 30-year term because many of PG&E's O&M activities for which measures would be implemented would not individually cause incidental take requiring related mitigation of species impacts. The Bay Area-wide ITP, as proposed, assumes that, even with the implementation of avoidance and minimization measures, covered activities are likely to cause incidental take of the covered species, and that take must be fully mitigated.

The vast majority of O&M activities affect less than 0.1 acre (approximately 66 by 66 feet), are regularly reoccurring, and take a few hours to complete. Operational activities typically consist of inspecting, monitoring, testing, cleaning, and operating valves, enclosures, switches, insulators, and other components. These O&M activities involve utility personnel working at existing facilities in existing ROWs or other utility properties. Maintenance activities consist of repairing and replacing facilities, structures, and access roads. This work includes electrical transmission and distribution

reconductoring projects, and gas pipeline replacement. This work also includes emergency repair and replacement, and vegetation management, including tree pruning and removal. These activities primarily take place at existing facilities and within existing ROWs and utility properties, although, to ensure regulatory compliance and the safety of its facilities, PG&E is required by law to manage or remove hazard trees and incompatible vegetation wherever they are located.

Minor new construction activities would also be covered under the ITP. Minor new construction ~~New structures~~ would be limited to new gas pressure limiting stations with an impact of up to 1 acre of natural vegetation, ~~and~~ electrical substation expansions with up to 3 acres of impacts on natural vegetation, ~~and undergrounding of power lines.~~ These facilities are adjacent to existing facilities and/or in utility or road ROWs.

As part of its conservation strategy and obligations under the ITP, PG&E will conserve, manage, and/or enhance habitat for covered species. PG&E will provide an endowment for mitigation lands to address the management needs of conserved properties. Activities required for land management typically include vehicle use in or near upland habitat, regular pedestrian surveys or sampling, installation and maintenance of fencing, and use of handheld equipment to manage vegetation and invasive species and otherwise enhance or restore habitat. In the course of acquiring, managing, monitoring, or enhancing habitat conservation lands consistent with a CDFW-approved management plan, take of covered species could result. The ITP is intended to cover habitat management activities. The ~~proposed Project~~ ITP will contain a compensatory mitigation plan that allows for offset of impacts on a regional basis. The plan would benefit habitat because it would provide permanent protection and management of lands that are large enough to support populations of covered species. Compensatory mitigation on a project-by-project basis does not typically provide the opportunity for this landscape-level approach.

Project Objectives

The proposed project has the following objectives:

- Streamline the incidental take permitting for the continued long-term O&M of PG&E electrical and natural gas facilities to ensure delivery of reliable and safe energy to PG&E customers, in accordance with California Public Utilities Commission mandates and in compliance with CESA.
- Complete necessary O&M activities and minor new construction in a manner that minimizes impacts on California tiger salamander, Alameda whipsnake, and California freshwater shrimp in the Bay Area's nine counties.
- Fully mitigate environmental impacts on California tiger salamander, Alameda whipsnake, and California freshwater shrimp from O&M activities and minor new construction in a manner that contributes to the long-term survival of these species as well as other species with similar habitat requirements.

Contents of the Environmental Impact Report

This EIR serves as an informational document for the public agency decision makers and the general public regarding the characteristics and objectives of the project, potential environmental impacts, recommended mitigation measures, applicant-proposed measures that would lessen or reduce

potentially significant impacts, and feasible alternatives to the project. Chapter 2, *Project Description*, provides a detailed description of the ~~project~~proposed ITP and covered activities. This discussion includes information regarding the background and purpose of the ~~project~~ITP, as well as descriptions of covered activities and applicant-proposed environmental protection-measures that are part of the project. The resource impact evaluations in Chapter 3, *Impact Analysis*, of this EIR evaluate the potential environmental impacts resulting from approval of the proposed ITP by CDFW, which authorizes incidental take of the covered species as described in Chapter 2. Over the 30-year permit term of the ITP, the incremental changes to future O&M, minor new construction, and habitat conservation, enhancement, and management caused by the ITP would result in temporary and permanent disturbance, which could result in environmental impacts. Chapter 3, *Impact Analysis*, describes the environmental and regulatory settings, identifies the environmental impacts of the project and covered activities, and specifies applicant-proposed measures and mitigation measures that would lessen or reduce significant impacts to a less-than-significant level or further reduce less-than-significant impacts. New information was added in Section 3.0, *Baseline for CEQA Analysis*, to establish the points of comparison against which the physical changes caused by the ITP are evaluated to determine environmental impacts. The baseline conditions for this EIR are the physical environmental conditions within the PG&E Permit Area at the time the NOP was published for this EIR (November 2017). PG&E has maintained its electrical and natural gas infrastructure per CPUC regulations, including O&M, for over 30 years. As such, this EIR acknowledges that PG&E's O&M activities are part of the baseline conditions in the Permit Area. Furthermore, the impact analyses in Chapter 3 rely on practices incorporated into the proposed covered activities to avoid and minimize potential impacts to ITP-covered species and CDFW trust resources, which are considered in the impact evaluations prior to determining the significance conclusion of each impact. Chapter 4, *Alternatives Analysis*, describes potential alternatives to the project, provides analysis of the alternatives' ability to meet project objectives, and identifies differences in the level of environmental impacts. Chapter 5, *Other CEQA Considerations*, discusses potential growth-inducing impacts, significant unavoidable impacts on the environment, significant irreversible environmental changes, and cumulative effects on the environment.

Summary of Impact Analysis

The impacts of the ~~covered activities~~ITP, proposed mitigation, and significance conclusions before and after mitigation are identified in detail in Chapter 3, *Impact Analysis*. Impact determinations associated with each resource area are summarized below.

Less-than-Significant Impact ~~with Mitigation~~

With implementation of field protocols (FPs), best management practices (BMPs), and avoidance and minimization measures (AMMs) (see Section 2.10, *Project Measures to Reduce Impacts* and Table 2-3) and PG&E's applicant proposed measures (APMs) (see Section 2.10, *Project Measures to Reduce Impacts* and Table 2-4), which are part of the project, issuance of the ITP would result in less-than-significant impacts to:

- Aesthetics
- Agricultural and forestry resources
- Air quality

- ~~Biological resources~~
- Cultural resources
- Energy
- Geology and soils
- Greenhouse gas emissions
- Hazards and hazardous materials
- Hydrology and water quality
- Land use and planning
- Mineral resources
- Noise
- Population and housing
- Public services
- Recreation
- Transportation and traffic
- Utilities and service systems
- Wildfires

Less-than-Significant Impact with Mitigation

Impacts to non-ITP covered biological resources would be less than significant with implementation of FPs, BMPs, and AMMs (see Section 2.10, *Project Measures to Reduce Impacts* and Table 2-3) and PG&E's APMs (see Section 2.10, *Project Measures to Reduce Impacts* and Table 2-4), which are part of the covered activities. Impacts to the three ITP-covered species, California tiger salamander, Alameda whipsnake, and California freshwater shrimp, would be less than significant with implementation of Mitigation Measures BIO-1, BIO-2, BIO-3, and BIO-4 in addition to the FPs, BMPs, AMMs, and APMs.

- Biological Resources
- ~~Agricultural and forestry resources~~
- ~~Air quality~~
- ~~Energy~~
- ~~Geology and soils~~
- ~~Greenhouse gas emissions~~
- ~~Land use and planning~~
- ~~Mineral resources~~
- ~~Population and housing~~
- ~~Public services~~
- ~~Recreation~~
- ~~Utilities and service systems~~

Table ES-1. Summary of Impacts, Applicant-Proposed Measures, and Mitigation Measures

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
Aesthetics					
Impact AES-1: Potential to have substantial adverse effect on a scenic vista	Less than Significant	APM AES-1: Restore disturbed areas APM AES-2: Protect scenic vistas and scenic highways APM AES-3: Shield temporary construction lighting APM AES-4: Apply minimum lighting standards APM AES-5: Reduce visibility of new structures in sensitive landscapes APM AES-6: Implement landscape buffers or other screening for minor	Less than Significant	None needed	Less than Significant
Impact AES-2: Potential to substantially damage scenic resources along a scenic highway	Less than Significant	APM AES-1: Restore disturbed areas APM AES-2: Protect scenic vistas and scenic highways APM AES-5: Reduce visibility of new structures in sensitive landscapes APM AES-6: Implement landscape buffers or other screening for minor	Less than Significant	None needed	Less than Significant
Impact AES-3: Degradation of the existing visual character or quality of the site and its surroundings in non-urbanized areas or conflict with applicable zoning and other regulations governing scenic quality in urbanized areas	Less than Significant	APM AES-1: Restore disturbed areas APM AES-2: Protect scenic vistas and scenic highways APM AES-5: Reduce visibility of new structures in sensitive landscapes APM AES-6: Implement landscape buffers or other screening for minor	Less than Significant	None needed	Less than Significant
Impact AES-4: Introduction of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.	Significant	APM AES-3: Shield temporary construction lighting APM AES-4: Apply minimum lighting standards	Less than Significant	None needed	Less than Significant with APMs

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
		APM AES-5: Reduce visibility of new structures in sensitive landscapes APM AES-6: Implement landscape buffers or other screening for minor			
Agricultural and Forest Resources					
Impact AG-1: Conversion of Important Farmland to nonagricultural use	Less than Significant	APM AG-1: Coordination with farmers and ranchers regarding construction activities	Less than Significant	None needed	Less than Significant
Impact AG-2: Conflict with existing zoning for agricultural use or with a Williamson Act contract	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact AG-3: Conflict with existing zoning of forest land, timberland, or timberland zoned Timberland Production	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact AG-4: Loss of forest land or conversion of forest land to non-forest use	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
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	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Air Quality					
Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plans	Less than Significant	APM AIR-1: Implement Dust Control Best Management Practices	Less than Significant	None needed	Less than Significant
Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an	Less than Significant	None needed	Less than Significant	None needed	Less than Significant

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
applicable federal or state ambient air quality standard					
Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations	Less than Significant	APM AIR-1: Implement Dust Control Best Management Practices	Less than Significant	None needed	Less than Significant
Impact AQ-4: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Biological Resources					
Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS	Significant	APM BIO-1: Prevent or minimize spread of invasive weeds APM BIO-2: Protect covered special-status wildlife encountered while performing covered activities <u>and report covered wildlife observations</u> APM BIO-3: Design and site minor new construction projects activities to avoid sensitive areas <u>APM BIO-3a: Minimize spread of invasive plant and plant pathogens in minor new construction</u> APM BIO-4: Avoid special-status plants APM BIO-5: Erect wildlife <u>flagging or</u> exclusion fencing APM BIO-6: Protect nesting birds <u>APM BIO-6a: Western burrowing owl avoidance</u> APM BIO-7: Avoid breeding and pupping bats APM BIO-8: Avoid Alameda whipsnake in core habitat <u>APM BIO-9: San Joaquin kit fox/American badger</u>	Significant	MM BIO-1: Acquire, preserve, and/or enhance suitable habitat for mitigation <u>MM BIO-2: California freshwater shrimp minimization measures</u> <u>MM BIO-3: California tiger salamander minimization measures</u> <u>MM BIO-4: Alameda whipsnake minimization measures</u>	Less than Significant with Mitigation

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
		APM HYDRO-1: Develop and implement a frac-out plan for projects using horizontal directional drilling (HDD)			
Impact BIO-2: Have 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	Less than Significant	APM BIO-1: Prevent or minimize spread of invasive weeds APM BIO-3: Design and site minor new construction projects <u>activities</u> to avoid sensitive areas <u>APM BIO-3a: Minimize spread of invasive plant and plant pathogens in minor new construction</u>	Less than Significant	None needed	Less than Significant
Impact BIO-3: Have a substantial adverse effect on federally protected wetlands as defined by CWA Section 404 (including marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means	Less than Significant	APM BIO-1: Prevent or minimize spread of invasive weeds APM BIO-3: Design and site minor new construction projects <u>activities</u> to avoid sensitive areas <u>APM BIO-3a: Minimize spread of invasive plant and plant pathogens in minor new construction</u>	Less than Significant	None needed	Less than Significant
Impact BIO-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	Less than Significant	APM BIO-3: Design and site minor new construction projects <u>activities</u> to avoid sensitive areas APM BIO-6: Protect nesting birds APM BIO-7: Avoid breeding and pupping bats	Less than Significant	None needed	Less than Significant
Impact BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	No Impact	None needed	No Impact	None needed	No Impact
Impact BIO-6: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural	Less than Significant	None needed	Less than Significant	None needed	Less than Significant

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
Community Conservation Plan, or other approved local, regional, or state habitat conservation plan					
Cultural Resources					
Impact CUL-1: Causes a substantial adverse change in the significance of a historical resource	Less than Significant	APM CR-1: Inventory, evaluate, and protect cultural resources	Less than Significant	None needed	Less than Significant
Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological resource	Less than Significant	APM CR-1: Inventory, evaluate, and protect cultural resources APM CR-2: Provide worker training APM CR-3: Inadvertent discovery of previously unidentified cultural resources	Less than Significant	None needed	Less than Significant
Impact CUL-3: Disturb any human remains, including those interred outside of dedicated cemeteries	Less than Significant	None Needed <u>APM CUL-4: Discovery of human remains</u>	Less than Significant	None needed	Less than Significant
Impact CUL-4: Cause a substantial adverse change in the significance of a tribal cultural resource (as defined in Public Resources Code Section 5020.1(k))	Less than Significant	None needed <u>APM CR-1: Inventory, evaluate, and protect cultural resources</u> <u>APM CR-2: Provide worker training</u> <u>APM CR-3: Inadvertent discovery of previously unidentified cultural resources</u> <u>APM CUL-4: Discovery of human remains</u> <u>APM CUL-5: Undiscovered potential tribal cultural resources</u>	Less than Significant	None needed	Less than Significant
Energy					
Impact EN-1: Wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact EN-2: Conflict with or obstruction of a state or local plan	No Impact	None needed	No Impact	None needed	No Impact

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
for renewable energy or energy efficiency					
Geology and Soils					
Impact GEO-1: Exposure of people or structures to 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	None needed	Less than Significant	None needed	Less than Significant
Impact GEO-2: Potential to result in substantial soil erosion or the loss of topsoil	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
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	None needed	Less than Significant	None needed	Less than Significant
Impact GEO-4: Placement of project-related facilities on expansive soil, creating substantial risk to life or property	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact GEO-5: Placement of facilities on 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	No Impact	None needed	No Impact	None needed	No Impact

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
Impact GEO-6: Directly or indirectly destroy a significant paleontological resource or site or unique geologic feature	Significant	APM GEO-1: Protect unanticipated paleontological resource discoveries APM GEO-2: Provide worker environmental awareness training	Less than Significant with APM	None needed	Less than Significant with APM
Greenhouse Gas Emissions					
Impact GHG-1: Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	Less than Significant	APM GHG-1: Avoid and minimize potential sulfur hexafluoride (SF ₆) emissions	Less than Significant	None needed	Less than Significant
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	None needed	Less than Significant	None needed	Less than Significant
Hazards and Hazardous Materials					
Impact HAZ-1 and HAZ-2: Creation of a significant hazard to the public or the environment through either the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	Less than Significant	APM HAZ-1: Spill response AMP HAZ-2: Vehicle refueling	Less than Significant	None needed	Less than Significant
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	Less than Significant	APM HAZ-1: Spill response AMP HAZ-2: Vehicle refueling	Less than Significant	None needed	Less than Significant
Impact HAZ-4: Placement of project-related facilities on a site that is included on a list of hazardous materials sites, and resulting	Less than Significant	APM HAZ-1: Spill response AMP HAZ-2: Vehicle refueling	Less than Significant	None needed	Less than Significant

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
creation of a significant hazard to the public or the environment					
Impact HAZ-5: Placement of project-related facilities within 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 a safety hazard for people residing or working in the project area	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact HAZ-6: Placement of project-related facilities in the vicinity of a private airstrip, resulting in a safety hazard for people residing or working in the project area	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact HAZ-7: Impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan	Significant	APM HAZ-1: Spill response AMP HAZ-2: Vehicle refueling APM TRA-1: Implement transportation best management practices	Less than Significant with APMs	None needed	Less than Significant with APMs
Impact HAZ-8: Exposure of people or structures to a significant risk involving wildland fires	Less than Significant	APM HAZ-1: Spill response AMP HAZ-2: Vehicle refueling	Less than Significant	None needed	Less than Significant
Hydrology and Water Quality					
Impact WQ-1: Violation of any water quality standards or waste discharge requirements	Less than Significant	APM HYDRO-1: Develop and implement a frac-out plan for projects using horizontal directional drilling (HDD)	Less than Significant	None needed	Less than Significant
Impact WQ-2: Substantial depletion of groundwater supplies or substantial interference with groundwater recharge	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact WQ-3: Substantial alteration of existing drainage patterns, including through the alternation of the course of a stream or river, in a	Less than Significant	None needed	Less than Significant	None needed	Less than Significant

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
manner that would result in substantial erosion or siltation onsite or offsite					
Impact WQ-4: Substantial alteration of existing drainage patterns, including through the alteration of the course of a stream or river, in a manner that would result in flooding onsite or offsite	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
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	None needed	Less than Significant	None needed	Less than Significant
Impact WQ-6: Other substantial degradation of water quality	No Impact	None needed	No Impact	None needed	No Impact
Impact WQ-7: Placement of housing within a 100-year flood hazard area	No Impact	None needed	No Impact	None needed	No Impact
Impact WQ-8: Placement of structures that would impede or redirect flood flows within a 100-year flood hazard area	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact WQ-9: Exposure of people or structures to significant risk involving flooding, including flooding as a result of the failure of a levee or dam	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact WQ-10: Contribution to inundation by seiche, tsunami, or mudflow	Less than Significant	None needed	Less than Significant	None needed	Less than Significant

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
Land Use					
Impact LU-1: Physical division of an established community	No Impact	None needed	No Impact	None needed	No Impact
Impact LU-2: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Mineral Resources					
Impact MIN-1: Contribute to the loss of availability of a known mineral resource that would be of value to the region and the residents of the state	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact MIN-2: Contribute to 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	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Noise and Vibration					
Impact NOI-1: Exposure of persons to or generation of noise levels in excess of applicable standards	Significant	APM NOI-1: Restrict construction hours APM NOI-2 Limit noise during construction near occupied residences	Less than Significant	None needed	Less than Significant with APMs
Impact NOI-2: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels	Less than Significant	APM NOI-1: Restrict construction hours	Less than Significant	None needed	Less than Significant
Impact NOI-3: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a	Less than Significant	None needed	Less than Significant	None needed	Less than Significant

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels					
Population and Housing					
Impact POP-1: Create substantial population growth either directly or indirectly	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact POP-2: Displace a substantial number of people or existing housing units, necessitating the construction of replacement housing elsewhere	No Impact	None needed	No Impact	None needed	No Impact
Public Services					
Impact PS-1: Create 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	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Recreation					
Impact REC-1: Increased use of existing recreational facilities, resulting in substantial physical deterioration	No Impact	None needed	No Impact	None needed	No Impact
Impact REC-2: Construction or expansion of recreational facilities that might have an adverse physical effect on the environment	No Impact	None needed	No Impact	None needed	No Impact

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
Transportation and Traffic					
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	APM TRA-1: Implement transportation best management practices	Less than Significant	None needed	Less than Significant
Impact TRA-2: Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)	Less than Significant	APM TRA-1: Implement transportation best management practices	Less than Significant	None needed	Less than Significant
Impact TRA-3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	Less than Significant	APM TRA-1: Implement transportation best management practices	Less than Significant	None needed	Less than Significant
Impact TRA-4: Result in inadequate emergency access	Less than Significant	APM TRA-1: Implement transportation best management practices	Less than Significant	None needed	Less than Significant
Utilities and Public Services					
Impact UT-1: Exceedance of wastewater treatment requirements of the applicable Regional Water Quality Control Board	No Impact	None needed	No Impact	None needed	No Impact
Impact UT-2: Construction of new water or wastewater treatment facilities or expansion of existing facilities, with the potential to cause significant environmental effects	No Impact	None needed	No Impact	None needed	No Impact
Impact UT-3: Construction of new stormwater drainage facilities or expansion of existing facilities, with the potential to cause significant environmental effects	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact UT-4: Creation of a need for new or expanded entitlements or	No Impact	None needed	No Impact	None needed	No Impact

Impact	Significance	Applicant-Proposed Measures (APMs)	Significance after APMs	Mitigation Measure (MM)	Significance after MM
resources for sufficient water supply					
Impact UT-5: Project-related exceedance of existing wastewater treatment capacity	No Impact	None needed	No Impact	None needed	No Impact
Impact UT-6: Project-related exceedance of the relevant landfill's permitted capacity	Less than Significant	None needed	Less than Significant	None needed	Less than Significant
Impact UT-7: Inconsistency with federal, state, and local statutes and regulations related to solid waste	No Impact	None needed	No Impact	None needed	No Impact
Wildfire					
Impact WF-1: Substantially impair an adopted emergency response plan or emergency evacuation plan	Less than Significant	APM TRA-1: Implement transportation best management practices	Less than Significant	None needed	Less than Significant
Impact WF-2: Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire	Less than Significant	APM FIRE-1: Construction fire prevention practices	Less than Significant	None needed	Less than Significant
Level of significance: LTS = less than significant; S = significant; SU = significant and unavoidable; NI = no impact.					

Chapter 1

Introduction and Scope of Environmental Impact Report

Pacific Gas and Electric Company (PG&E) has filed an application for an Incidental Take Permit (ITP) under Section 2081 of the California Endangered Species Act (CESA) with the California Department of Fish and Wildlife (CDFW). The ITP would provide incidental take coverage for PG&E's San Francisco Bay Area (Bay Area) Operations and Maintenance (O&M) activities and minor new construction for natural gas pipelines and electric lines, and would by establishing a comprehensive approach to avoid, minimize and fully mitigate impacts on three covered species: California tiger salamander, Alameda whipsnake, and California freshwater shrimp where they may occur within the 402,440 acre Permit Area. Please refer to Chapter 2, *Project Description*, for more information about the activities that would be covered by the ITP.

CDFW's issuance of the ITP would not change the ~~nature-need or overall -and~~ extent of the work that will be required within the next 30 years on PG&E's natural gas and electric systems in the Bay Area, but it would include requirements for avoiding and minimizing take of the three covered species, which may alter the approach for carrying out O&M and minor new construction activities by shifting disturbance area locations, limiting timing, or implementing physical actions to protect the species and their habitat; however, t The ITP would eliminate the need for PG&E to obtain incidental take authorization on a case by case basis when implementing covered activities likely to cause take of the covered species, which would facilitate more efficient implementation of covered activities.

The ITP would establish standardized avoidance and minimization measures, which would shape the way PG&E carries out covered activities, and provide a comprehensive approach to habitat conservation for the three covered species (California tiger salamander, Alameda whipsnake, and California freshwater shrimp) that enables landscape level habitat preservation and enhancement that is more ecologically beneficial. The ITP's comprehensive approach to compensatory mitigation would result in more habitat conservation than would otherwise occur over the 30-year term because many of PG&E's O&M activities would not individually require an ITP and related offsets to species impacts. The ~~Bay Area-wide Permit a~~ Area-wide ITP, as proposed, assumes recognizes that, even with the implementation of avoidance and minimization measures, covered activities are likely to cause incidental take of the covered species, and that take must be minimized and fully mitigated.

1.1 The California Environmental Quality Act

This PG&E Bay Area O&M Incidental Take Permit Environmental Impact Report (EIR) has been prepared in conformance with the California Environmental Quality Act (CEQA) (Public Resources Code §§ 21000 et seq.) and the CEQA Guidelines (14 California Code of Regulations §§ 15000 et seq.) (CEQA Guidelines). Issuing the ITP is a discretionary action that requires CDFW to comply with CEQA in accordance with CEQA Guidelines Sections 15021 and 15040 as well as Title 14, Section 783.5(d) of the California Code of Regulations. While the California Public Utilities Commission (CPUC) has jurisdiction over PG&E's design, construction, operations and maintenance, and construction activities, CDFW is the lead agency for CEQA review because CDFW is responsible for the discretionary action of issuance of the ITP is the only discretionary permit being requested for

~~this regional, multi-species action.~~ The covered activities, when they take place as individual projects, may require discretionary permits or approvals from the CPUC or other state agencies in addition to coverage under the ITP, ~~although a majority of the O&M work would not require any discretionary permitting or would be exempt from CEQA review.~~

~~Under the CEQA process,~~ an EIR must be prepared when there is substantial evidence that supports a fair argument that significant effects may result from project implementation. Consistent with Section 15121(a) of the CEQA Guidelines, this EIR is a public information document that assesses and discloses the potential environmental effects of conducting O&M and minor new construction activities, as well as habitat conservation and enhancement, covered by the ITP.

~~CEQA authorizes~~ requires a lead agency to impose mitigation “in order to substantially lessen or avoid significant effects on the environment caused by the project, to the extent feasible, consistent with applicable constitutional requirements such as the “nexus” and “rough proportionality” standards established by case law (citations omitted).” controlling law (CEQA Guidelines, § 15041, subd. a.). Thus, the aim of CEQA mitigation is to reduce project impacts to a less-than-significant level. In contrast, CESA requires that impacts related to the incidental take of species be “fully mitigated.” CDFW may issue an ITP for an otherwise lawful activity if, among other things, the impacts of the take are minimized and fully mitigated, there is adequate funding for the mitigation measures, and the take does not jeopardize the continued existence of the species.

1.1.1 California Department of Fish and Wildlife Authority

CDFW is the regulatory authority that may issue the PG&E Bay Area O&M ITP for California tiger salamander, Alameda whipsnake, and California freshwater shrimp. Therefore, CDFW has authority to enforce the conditions of the ITP for the covered O&M and minor new construction activities and their potential environmental impacts on the three ITP-covered species. In addition, CDFW is a trustee agency and has jurisdiction by law over natural resources affected by the ITP which are held in trust for the people of the State of California. CDFW’s trustee agency role relates to the fish and wildlife of the state, native plants, and game refuges, ecological reserves, and other areas administered by CDFW. Furthermore, as CEQA lead agency, although CDFW does not have regulatory authority over environmental resources outside of its jurisdiction, CDFW is required to evaluate and disclose the significant and potentially significant environmental impacts due to issuance of the ITP and to adopt all feasible mitigation to reduce those impacts to a less-than-significant level.

1.1.2 The Purpose of this Environmental Impact Report

Pursuant to the CEQA, this EIR discloses and analyzes the potential direct and indirect environmental effects associated with the proposed Pproject. ~~The Pproject, which consists of issuance of an ITP for PG&E’s covered activities, under Section 2081 of the California Fish and Game Code, which regulates take of listed species under the CESA~~ PG&E’s covered activities for which CDFW is issuing an ITP under Section 2081 of the California Fish and Game Code, which regulates take of species listed under the CESA. The ITP ~~will~~ would provide incidental take of three species, the California tiger salamander, Alameda whipsnake, and California freshwater shrimp for the next 30 years. This EIR is intended to serve as an informational document for the public agency decision makers and the general public regarding the characteristics and objectives of the project, potential environmental impacts, recommended mitigation measures and feasible alternatives to the project.

CDFW has determined that preparation and certification of the EIR in compliance with CEQA is required before CDFW may decide whether to issue the requested ITP for ~~proposed Project the covered~~ activities in compliance with CESA. (See generally Fish & G. Code, § 2081, subd. (b), (c).) CDFW is the lead agency under CEQA. In this respect, this EIR will describe the physical environmental conditions related to the Project Permit Area, and disclose and analyze significant or potentially significant direct and indirect environmental impacts that ~~are~~ could arise from the issuance of the ITP under CDFW's permitting authority, as well as those impacts to fish and wildlife resources held in trust by CDFW for the people of California.

The standards for adequacy of an EIR, as defined in the State CEQA Guidelines, section 15151, are as follows:

An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

This document has been prepared in accordance with the above legal standards for adequacy of an EIR under CEQA and the State CEQA Guidelines.

The provisions governing PG&E's request for an ITP for proposed ~~p~~Project activities that would result in the take of state-listed species under CESA are found in Fish and Game Code section 2081, subdivisions (b) and (c). "Take" as defined in section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt pursue, catch, capture, or kill." As discussed below, CESA authorizes CDFW to permit allows for authorized take incidental to otherwise lawful activities, subject to various conditions.

According to Section 15002(a) of the CEQA Guidelines, the basic purpose of CEQA is to:

- Inform government decision makers and the public about the potential significant environmental effects of proposed activities.
- Identify ways that adverse environmental impacts can be avoided or significantly reduced.
- Prevent significant, avoidable adverse impacts to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governing agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The process of preparing an EIR involves the following discrete steps.

- **Notice of Preparation (NOP).** Prior to preparing the Draft EIR, the lead agency releases an NOP to solicit the comments of public agencies and interested organizations and individuals regarding the scope and content of the EIR. The NOP is available for comment for at least 30 days. An NOP was distributed for this EIR in November 2017. The comments on the NOP received from agencies and the public are included in Appendix A, *Notice of Preparation*, of this EIR.

- **AB 52 Tribal Consultation.** Assembly Bill (AB) 52 (Statutes of 2014) requires consideration of a project's potential to significantly impact a Tribal Cultural Resource (TCR) in CEQA evaluations. AB 52 requires that the lead agency provide early notice of projects to tribe(s) and, if requested by a tribe, consultation with requesting tribes to inform the CEQA process. As lead agency, CDFW sent notification letters for the proposed PG&E Bay Area Incidental Take Permit on November 30, 2017. No tribes requested AB 52 consultation.
- **Scoping Meeting.** A scoping meeting is intended to offer an additional opportunity for input prior to preparation of the Draft EIR. Two scoping meetings were conducted for public agencies and members of the public at the Burlingame Recreation Center (850 Burlingame Avenue, Burlingame, CA 94010) on January 8, 2018, from 4:00 p.m. to 6:00 p.m. and the Mill Valley Community Center, Terrace Lounge (180 Camino Alto, Mill Valley, CA 94941) on January 9, 2018, from 4:30 p.m. to 6:30 p.m.
- **Preparation and release for public review and comment of the Draft EIR.** The Draft EIR will be available for 45 days for review and comment by public agencies and interested organizations and individuals.
- **Preparation of the Final EIR.** The Final EIR will present the comments received during the public review period (and a complete list of commenters), written responses to the comments related to environmental issues, and any revisions that are made to the Draft EIR in response to the comments. CDFW will certify the Final EIR prior to taking action on the project.
- **Adoption of findings and a statement of overriding considerations.** If there are any unavoidable adverse environmental effects that cannot be mitigated to a less-than-significant level, an adoption of findings and a statement of the overriding considerations will be issued.

1.1.3 Document Format

Sections 15120 et seq. of the CEQA Guidelines identify the content requirements for EIRs. An EIR must include a description of the environmental setting, an environmental impact analysis, mitigation measures, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. This EIR is organized as follows.

- **Executive Summary**—presents an overview of the project including its location and objectives, a brief description of the purpose and contents of the environmental impact report, and a summary of the impact conclusions with a table listing the impacts that would result from the project and covered activities and each impact's level of significance.
- **Chapter 1—Introduction and Scope of Environmental Impact Report** (this chapter) provides an overview of the project and CEQA requirements, and a summary of the scope, intent, and contents of the EIR.
- **Chapter 2—Project Description** ~~presents an overview of the project, describes the Permit Area, the proposed ITP, and the covered actions~~activities including the location and description of O&M, and minor new construction activities, and habitat enhancement and management; provides a summary of the project's purpose and objectives; and identifies anticipated permits and approvals.
- **Chapter 3—Impact Analysis** describes the existing environmental setting, regulatory setting, and discusses the environmental impacts of the project and covered activities. This chapter also identifies mitigation measures and applicant-proposed measures to reduce potential impacts.

- **Chapter 4—Alternatives Analysis** describes potential alternatives to the project, along with analyses of the alternatives' ability to meet project objectives and differences in the level of environmental impacts.
- **Chapter 5—Other CEQA Considerations** discusses other CEQA issues, including potential growth-inducing impacts, significant unavoidable impacts on the environment, significant irreversible environmental changes, and cumulative effects on the environment.
- **Chapter 6—Environmental Impact Report Preparers** provides the names of the EIR authors and consultants, and agencies or individuals consulted during preparation of the EIR.
- **Appendix A—Notice of Preparation** presents the proposed Project covered by the application for an ITP under CESA Section 2081 with CDFW.
- **Appendix B—Summary of Plant Analysis** presents the results of additional GIS analysis of California Natural Diversity Database records conducted for all special-status plant species.
- **Appendix C—Avian Protection Plan** describes PG&E's program to address avian electrocutions, collisions, and nesting birds.

1.2 Intended Uses of this EIR

As the lead agency, CDFW will use this EIR in accordance with CEQA Guidelines Section 15092 to disclose and analyze the direct or indirect, significant or potentially significant environmental effects associated with the issuance of an ITP under Section 2081 of the California Fish and Game Code, which regulates take of species listed under the CESA and activities covered by the ITP.

This EIR focuses on the direct and indirect effects of the proposed issuance of the requested ITP by CDFW for PG&E's covered activities. PG&E has maintained its electrical and natural gas infrastructure per CPUC regulations, including O&M activities, for over 30 years. As such, this EIR acknowledges that PG&E's ongoing O&M activities are part of the baseline conditions in the Permit Area. Against this backdrop, this EIR evaluates whether issuance of the ITP conditioning PG&E ongoing O&M and minor new construction activities in the Permit Area during the 30-year term of the permit, including habitat conservation and management activities required by the permit, would cause an incremental physical change to baseline conditions and a related substantial or potentially substantial adverse effect to the environment. As CEQA lead agency for the ITP, CDFW must evaluate, disclose, and adopt feasible mitigation for significant environmental impacts.

~~The ITP would cover incidental take of three species that could result from PG&E's implementation of O&M activities, minor new construction, and habitat conservation and enhancement for a period of 30 years. The covered species are California tiger salamander and Alameda whipsnake, which are listed under CESA as threatened, and California freshwater shrimp, which is listed under CESA as endangered.~~

Thus, in addition to the resource protection measures included as part of the covered activities, the ITP would condition covered activities to the extent that implementation of the ITP creates impacts to covered species or other species subject to CDFW authority. Covered activities are not being approved by this ITP and may require other discretionary permits by other agencies that could trigger additional formal CEQA review (CEQA Guidelines, §§ 153002, subdiv. (3), 15004) or application of CEQA's statutory or categorical exemptions (CEQA Guidelines, § 15061) and the

exceptions to the exemptions (CEQA Guidelines, § 15300.2). ~~This EIR could be used to establish that impacts to the covered species resulting from the covered activities under this ITP would be less than significant. It could also be used by CDFW to support issuance of future Lake and Streambed Alteration Agreements for individual covered activities within the Bay Area.~~

1.2.1 Responsible and Trustee Agencies

In addition to CDFW as the lead agency and a trustee agency, this document may be used by other responsible agencies for approval of permits, as listed in Table 1-1, below. Responsible agencies may include the Regional Water Quality Control Board or California State Lands Commission.

Table 1-1. Other Permits and Approvals that Could Be Required for Covered Activities

<u>Agency</u>	<u>Permit/Consultation/ Approval</u>	<u>Jurisdiction/Purpose</u>	<u>Notes/Assumptions</u>
Federal Agencies			
<u>U.S. Army Corps of Engineers</u>	<u>Clean Water Act Section 404 nationwide permit</u>	<u>Fill of waters of the United States</u>	<u>Permits are generally issued 45 days from submittal of a complete application; however, compliance with Section 401 must be certified first, and review under Section 7 of the federal Endangered Species, Section 106 of the National Historic Preservation Act, and CEQA must be completed.</u>
	<u>Clean Water Act Section 408 permit</u>	<u>Alteration of civil works projects</u>	<u>U.S. Army Corps of Engineers has 90 days to render a decision or provide an estimated date of final decision.</u>
<u>U.S. Fish and Wildlife Service</u>	<u>Consultation under Section 7 of the federal Endangered Species Act (when activity has a federal nexus)</u>	<u>Activities that may affect federally listed species or their habitats</u>	<u>Consultation can take 135 days to 1 year from submittal of the consultation request to the lead agency.</u>
	<u>Consultation under Section 10 of the federal Endangered Species Act</u>	<u>Activities that may affect federally listed species or their habitats</u>	<u>PG&E has a Habitat Conservation Plan that addresses federally listed species in the Bay Area.</u>
<u>Advisory Council on Historic Preservation</u>	<u>National Historic Preservation Act Section 106 review</u>	<u>Activities on federal land that may affect cultural or historic resources</u>	<u>There is no regulatory timeline for Section 106 compliance; however, a minimum of 1 year is anticipated.</u>
<u>Federal Aviation Administration</u>	<u>Aeronautical Study under 49 United States Code Section 44718, Title 17 Code of Federal Regulations, Part 77</u>	<u>Determination of hazard to air navigation</u>	<u>PG&E must file Federal Aviation Administration Form 7460-02, Notice of Actual Construction or Alteration, with the agency at least 45 days prior to construction.</u>
State Agencies			
<u>State Water Resources Control Board</u>	<u>National Pollutant Discharge Elimination System—Construction Storm Water Permit</u>	<u>Storm water discharges associated with construction activities disturbing 1 or more acre of land</u>	<u>Permits are generally issued 10 days following the submittal of the complete notice of intent.</u>
	<u>National Pollutant Discharge Elimination System—Order for Discharges from Natural Gas</u>	<u>Discharges from natural gas utility construction and maintenance activities</u>	<u>Submittal of completed notice of intent at least 30 days prior to discharge.</u>

<u>Agency</u>	<u>Permit/Consultation/ Approval</u>	<u>Jurisdiction/Purpose</u>	<u>Notes/Assumptions</u>
	<u>Utility Construction, Operations and Maintenance Activities</u>		
<u>California Coastal Commission</u>	<u>Coastal Development Permit</u>	<u>Work in coastal zone; ensure scenic integrity of and access to coastal zone</u>	<u>Permits are issued by local governments with certified local coastal plans or the CCC.</u>
<u>California Public Utilities Commission</u>	<u>Advice Letter, Permit to Construct, or Certificate of Convenience and Necessity</u>	<u>Authorized construction of non-exempt electric power line or substations facilities</u>	<u>Approval timing varies with the level of permitting required.</u>
<u>California Department of Fish and Wildlife</u>	<u>California Fish and Game Code Section 1600 Streambed Alteration Agreement</u>	<u>Activities that substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake.</u>	<u>Agreements are generally issued 90 days after the submittal of a complete application.</u>
	<u>Individual California Endangered Species Act Section 2081 Incidental Take Permit</u>	<u>Activities that may affect state-listed species aside from California tiger salamander, Alameda whipsnake, and California freshwater shrimp</u>	<u>Permits are generally issued 90 to 120 days after the submittal of the complete application but can take up to 1 year.</u>
<u>Regional Water Quality Control Board</u>	<u>Clean Water Act Section 401 Water Quality Certification</u>	<u>Activities authorized by federal agencies that may affect state water quality</u>	<u>Permits are generally issued within several months of a complete application and completed CEQA.</u>
	<u>Waste Discharge Requirements</u>	<u>Discharge of trench water or hydrostatic test water that may affect waters of the state</u>	<u>Notice timing varies by activity and level of analysis needed.</u>
<u>State Historic Preservation Officer</u>	<u>Consultation</u>	<u>Activities that may affect cultural or historic resources</u>	<u>The consultation timeline assumes there would be a potential effect on historic properties and a consultation period of at least 1 year.</u>
<u>California Department of Transportation</u>	<u>Encroachment Permit ^a</u>	<u>Construction of facilities within, under, or over state highway rights-of-way</u>	<u>Permits are generally issued 60 calendar days after the submittal of a complete application and in compliance with all other statutory requirements, including CEQA.</u>
<u>Local Agencies</u>			
	<u>Encroachment Permit ^a</u>	<u>Construction of facilities within, under, or over city or county road rights-of-way</u>	--

^a The issuance of an encroachment permit is anticipated to require a Traffic Control Plan and a Traffic Management Plan.

1.3 Reviewing an EIR

1.3.1 Making Effective Comments

CDFW will accept written comments during the review period described below. Please focus your comments on the environmental issues and adequacy of the Draft EIR.

1.3.2 Submitting Comments

The Draft EIR will be available for public review during the 45-day public review period, beginning on December 31, 2020, and ending on February 16, 2020. During that time, agency representatives and members of the public will have the ability to submit written comments on the Draft EIR to the address provided below. Please insert “PG&E Bay Area O&M ITP DEIR” in the subject line.

Address: 2825 Cordelia Road, Suite 100, Fairfield, CA 94534

Contact: Melissa Farinha

Phone: (530) 351-4801

Email: Melissa.Farinha@wildlife.ca.gov

1.4 Final EIR

After the end of the public review period and as part of preparing the Final EIR, CDFW will prepare written responses to all environmental issues raised through the public review process. The Final EIR will present the comments received, written responses to comments, a complete list of commenters, and revisions made to the Draft EIR (if warranted) in response to comments received. It may also contain additional information necessary to respond to the comments.

Chapter 2

Project Description

~~For purposes of the California Environmental Quality Act (CEQA), the project consists of This EIR evaluates the proposed issuance of an Incidental Take Permit (ITP) by the California Department of Fish and Wildlife (CDFW) for Pacific Gas & Electric Company's (PG&E's) covered activities, described in detail in Section 2.7, Covered Activities, for which the California Department of Fish and Wildlife's (CDFW's) is issuing an Incidental Take Permit (ITP). The ITP will~~ The ITP would condition the covered activities to the extent that implementation of the ITP results in impacts on covered species or other species subject to CDFW authority. The ITP would provide take coverage for three species, the California tiger salamander, Alameda whipsnake, and California freshwater shrimp (covered species). In addition, as a trustee agency, CDFW has jurisdiction by law over natural resources affected by the ITP that are held in trust for the people of the State of California. CDFW is the trustee agency with regard to the fish and wildlife of the state, native plants, and game refuges, ecological reserves, and other areas administered by CDFW. This chapter presents a description of the objectives of the proposed project, the ITP under consideration by CDFW, and the covered activities.

PG&E has submitted an application to CDFW for an ITP under Section 2081 of the California Endangered Species Act (CESA).

The ITP would ~~cover~~ authorize take of the covered species that could occur as a result of implementation of PG&E's operations and maintenance (O&M) activities related to natural gas pipelines and electric transmission and distribution lines, minor new construction activities, and habitat management and enhancement activities (together constituting the covered activities) in a nine-county region (i.e., San Francisco Bay Area) consisting of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, and Solano Counties. The ITP ~~also~~ would establish a comprehensive approach to avoid and minimize impacts on covered species and to mitigate impacts. The duration of the ITP would be 30 years to coincide with PG&E's federal permit issued under the *Bay Area Operations and Maintenance Habitat Conservation Plan* (Bay Area O&M HCP) in October 2017.

This EIR focuses on the direct and indirect effects of the proposed issuance of the requested ITP by CDFW for PG&E's covered activities. PG&E has maintained its electrical and natural gas infrastructure per California Public Utilities Commission (CPUC) regulations, including O&M, for over 30 years. As such, this EIR acknowledges that PG&E's ongoing O&M activities are part of the baseline conditions in the Permit Area. Against this backdrop, this EIR evaluates whether issuance of the ITP conditioning PG&E ongoing O&M and minor new construction activities in the Permit Area during the 30-year term of the permit, including habitat conservation and management activities required by the permit, would cause an incremental physical change to baseline conditions and a related substantial or potentially substantial adverse effect to the environment. As the California Environmental Quality Act (CEQA) lead agency for the ITP, CDFW must evaluate, disclose, and adopt feasible mitigation for significant impacts that could result from issuance of the ITP for the covered activities.

~~This ITP will not change the nature and extent of the work that will be required within the next 30 years on PG&E's natural gas and electric systems in the San Francisco Bay Area (Bay Area), nor will the ITP enable work to be done by PG&E that would not otherwise be done. Rather, the ITP will~~ The

~~ITP would~~ eliminate the need to obtain individual incidental take authority when ~~its~~ covered activities would affect ~~a~~ an ITP-covered species. ~~In exchange, the ITP will~~ The ITP would establish standardized avoidance and minimization measures (AMMs), which ~~will~~ would shape the way PG&E conducts covered activities, and a comprehensive approach to habitat conservation that enables landscape-level habitat preservation and enhancement that is ecologically beneficial resulting from a programmatic approach. The ITP's comprehensive approach to compensatory mitigation ~~will~~ would result in more habitat conservation than would otherwise take place over the 30-year term because many of PG&E's O&M activities would not individually require an ITP and related mitigation for species impacts. Rather, the Bay Area-wide ITP ~~will~~ would facilitate compensatory mitigation for temporary and permanent impacts when covered activities take place in potential habitat for covered species.

2.1 Project Objectives

The proposed project has the following objectives.

- Streamline incidental take permitting for the continued long-term O&M of PG&E electrical and natural gas facilities to ensure delivery of reliable and safe energy to PG&E customers, in accordance with ~~California Public Utilities Commission (CPUC)~~ mandates.
- Complete necessary O&M activities and minor new construction in a manner that minimizes impacts on California tiger salamander, Alameda whipsnake, and California freshwater shrimp in the Bay Area's nine counties.
- Fully mitigate environmental impacts on California tiger salamander, Alameda whipsnake, and California freshwater shrimp from O&M activities and minor new construction in a manner that contributes to the long-term survival of these species and other species with similar habitat requirements.

2.2 Permit Area

For purposes of this environmental impact report (EIR), the *Permit Area* (Figure 2-1) consists of PG&E gas and electrical transmission and distribution facilities ~~plus and their~~ rights-of-way (ROWs), the lands owned by PG&E or subject to PG&E easements to maintain these facilities, access routes associated with PG&E's routine maintenance, ~~a buffer around certain lands adjacent to the ROW, and mitigation areas~~ conservation lands acquired to mitigate impacts on the ITP-covered species resulting from O&M and minor new construction activities within the nine Bay Area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. The *study area* consists of the nine counties collectively.

The *Permit Area* currently encompasses approximately 402,440 acres.¹ PG&E ROWs and facilities in the Permit Area are located in the following land cover types: approximately 128,735 acres (32%) are in natural land cover types, approximately 246,777 acres (61%) are in urban areas, and

¹ This number and the percentages and acreages of existing conditions shown throughout the EIR are approximate and based on conditions as described in PG&E's *Bay Area Operations and Maintenance Habitat Conservation Plan*. Over the next 30 years, changes will occur due to land use and regulatory changes, new construction, acquisition of additional utility property and habitat lands, and other factors.

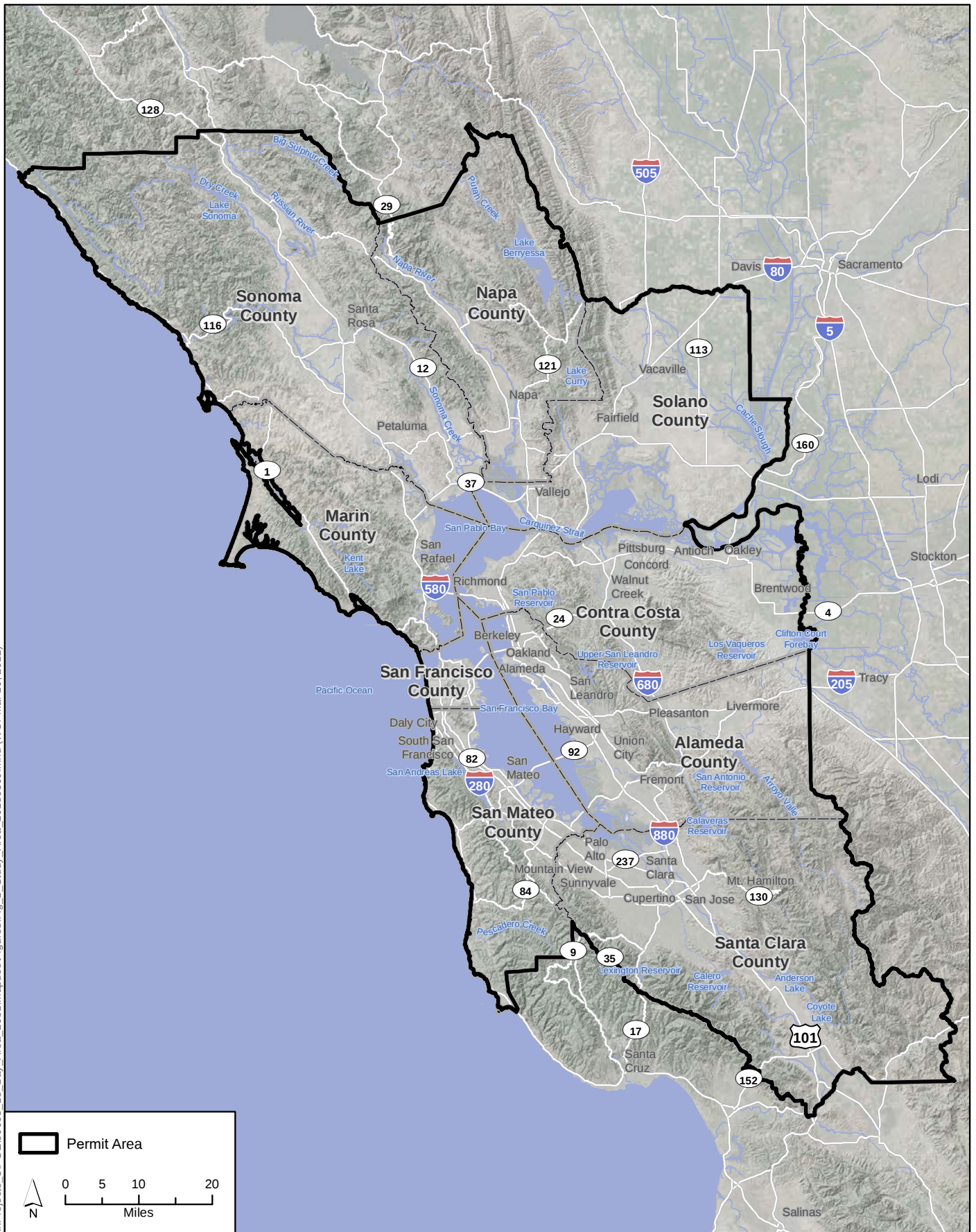


Figure 2-1
Permit Area

approximately 26,928 acres (7%) are in agricultural areas (Figure 2-2). The estimated acreage of habitat for the three ITP-covered species within the Permit Area is substantially smaller:

- California tiger salamander habitat—approximately 43,500 acres
- Alameda whipsnake habitat—approximately 10,800 acres
- California freshwater shrimp habitat—approximately 100 acres

The 402,440-acre Permit Area, the percentages of land cover types, and the covered species habitat acreages are approximate, based on the conditions as described in PG&E's *Bay Area Operations and Maintenance Habitat Conservation Plan*. Over the next 30 years, changes in the Permit Area will occur due to land use and regulatory changes, new facility construction, acquisition of additional utility property and habitat lands, and other factors.

Activity and project O&M and minor new construction locations vary year to year based on maintenance schedules, changes in maintenance priority, and the need to respond to emergencies. As a result, in any given year work may be implemented anywhere in the Permit Area. O&M activities are expected to be performed throughout PG&E's ROWs and in close proximity to the ROWs over the course of the 30-year permit term. Activities on habitat conservation lands would also be covered.

All proposed O&M and most minor new construction activities would be implemented within or adjacent to the Permit Area, with the exception of gas and electric line extensions, which would extend from existing ROWs for no more than 2 miles. Although most activities described in this chapter would be conducted only in the Permit Area, this EIR addresses the potential environmental impacts in the study area of covered activities. Minor new construction includes construction of gas pressure limiting stations, minor electrical substation expansions, and underground electric lines, which are adjacent to existing facilities and/or in utility or road ROWs (see G-14, E-14 and E-15).

Maximum facility corridor widths were established based on the facility type to establish an approximate maximum area in which O&M activities would be implemented. Table 2-1 summarizes the land area associated with each type of activity or facility. Minor new construction activities, ~~which consist of such as new gas pressure limiting stations, or substation expansions, and new lines to extend service to new commercial or residential customers,~~ could require the acquisition of additional small easements. These easements would be adjacent to, or extend from, existing facilities. A buffer was established along gas lines and electric transmission and distribution lines to include the facility infrastructure (e.g., pipes, towers, conductors, and poles) and immediately adjacent lands. The buffers vary by facility size and type with the maximum facility corridor width for electric facilities established at 200 feet for 500 kilovolt (kV) lines, 120 feet for 230 kV lines, and 80 feet for 60/70/115 kV lines. Maximum facility corridor width for gas transmission and distribution facilities is 150 feet and 25 feet, respectively.

Table 2-1. Type and Size of Facilities and Work Areas ~~(Estimated Acreage)~~

Type of Facility	Size of Facility	Maximum Facility Corridor Width (feet)	Buffer Area (feet)	Work Area (feet)
Electrical transmission	500 kilovolt (kV)	200	200	400
Electrical transmission	230 kV	120	120	240
Electrical transmission	60/70/115 kV	80	80	160
Gas transmission	All	150	150	300
All distribution facilities	All	25	25	50

2.3 Permit Term

The ITP is proposed to have a 30-year term.

2.4 Covered Species

The ITP would cover California tiger salamander and Alameda whipsnake, which are listed under CESA as threatened, and California freshwater shrimp, which is listed under CESA as endangered.

2.5 Conservation Strategy

PG&E's proposed ITP includes a compensatory mitigation plan to ensure that impacts on the three ITP-covered species (California tiger salamander, Alameda whipsnake, and California freshwater shrimp) are fully mitigated. The plan includes a strategy for mitigating both temporary and permanent impacts on the covered species and is expected to benefit special-status species as well. The compensatory mitigation plan requires that PG&E provide mitigation in advance of impacts. Habitat mitigation would be provided for covered species based on acreages of estimated and actual habitat losses consistent with jump start and stay ahead mitigation approaches. *Jump start* means land acquisition, preservation, and/or habitat enhancement efforts that are made in advance of permit issuance. *Stay ahead* means that PG&E will "stay ahead" of its mitigation obligations by calibrating the mitigation credits that may be necessary for future years based on information from the annual report for the prior year. Mitigation options include the placement of conservation easements on land purchased in fee by PG&E or on lands owned by others, and the purchase of mitigation credits from approved banks, or for freshwater shrimp habitat – creation, restoration, or enhancement as approved by CDFW. For the conservation easements, PG&E would fund endowments to provide for management in perpetuity.

PG&E would locate mitigation opportunities in accordance with specific habitat requirements of the ITP-covered species. Factors considered would include size (prioritizing large contiguous areas of habitat), surrounding compatible land uses, coordination with other local and regional conservation efforts, location relative to the impact areas, and sites that are sensitive to development pressure or land use changes. For habitat lands conservation projects, management plans would be prepared for each proposed property, which would include an analysis to determine the required endowment amount for management. The management plans would include elements such as:

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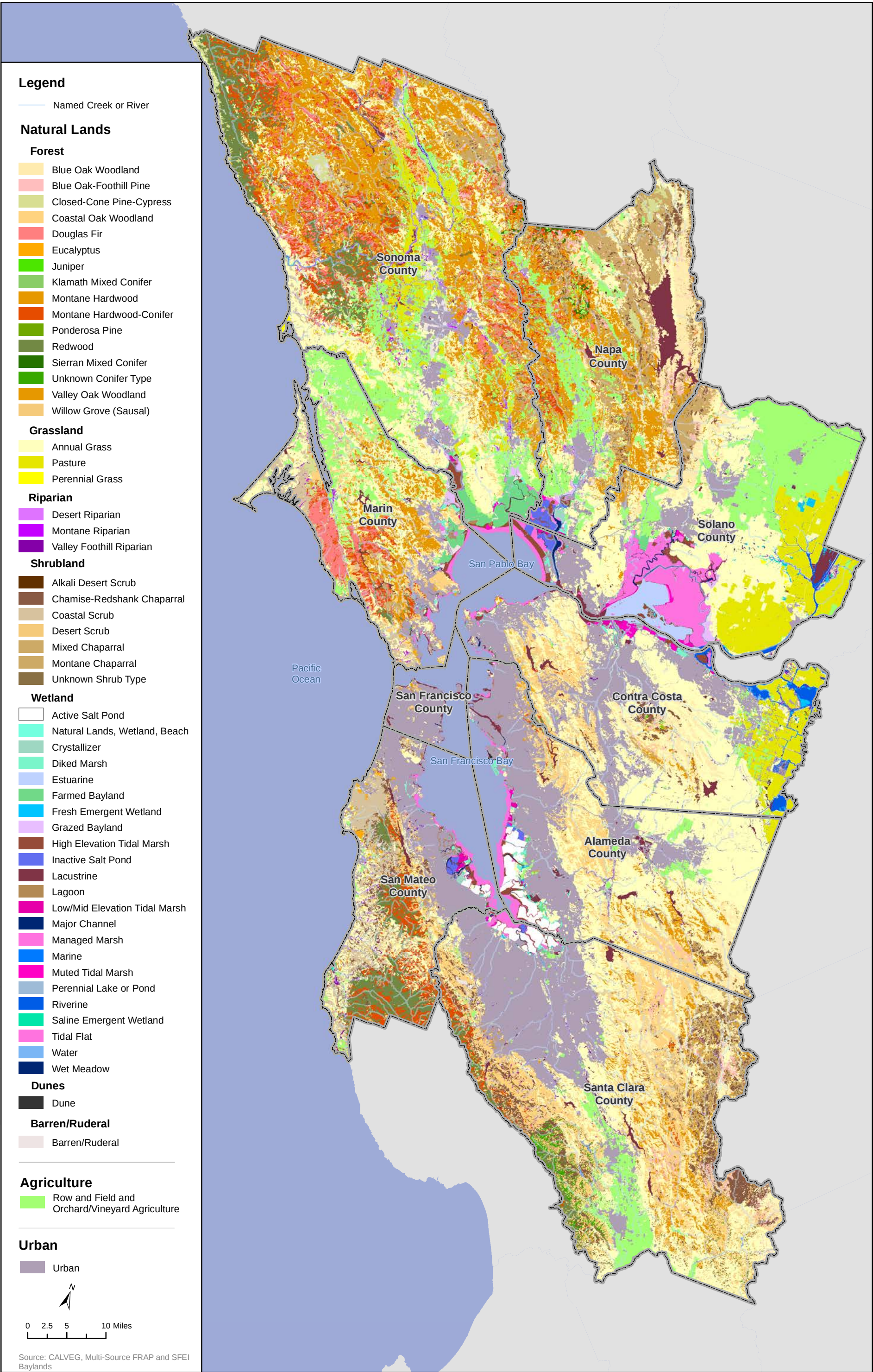


Figure 2-2
Land-Cover Types in the Study Area

- List of covered species to be managed under the plan.
- Management goals.
- Description of management and enhancement activities.
- Maps of existing habitat.
- Acreage table for each habitat type included within conserved land.
- Maps of needed fence and sign locations.
- Description of anticipated management activities to be performed, including vegetation management.
- Maps of habitat anticipated to result from enhancement.
- Success criteria for habitat enhancement or restoration and restoration plans to be implemented if success criteria are unmet.
- Description of applicable monitoring activities.
- Name and agreement with conservation easement holder, if any, or deed restrictions on fee-owned land.
- Cost of management and endowment.
- Name and agreement with managing entity.
- Description of other activities allowed on the preserve (e.g., education, flood control) and how their impacts on covered species would be minimized.
- Determination of whether public access would be permitted.
- Description of potential revenue-generating activities to be permitted, if applicable.
- Description of how unwanted or illegal activities would be eliminated or reduced in the preserve.
- Description of methods for predator control (e.g., feral cats, coyotes, bullfrogs), if necessary.

PG&E proposes to meet a portion of its conservation goals by acquiring conservation lands during the ITP development that will count toward compliance requirements when the ITP is issued. The identification, evaluation, acquisition, conservation easements, management plans, and endowments take considerable time. Because of this level of effort, key acquisitions identified during the ITP development would ensure that PG&E's compensatory mitigation would stay ahead of impacts. PG&E would maintain a database of mitigation acreage acquired and used for covered species and activities.

Habitat lands for conservation identified to date that may be used as mitigation for impacts on ITP-covered species include the following properties.

- Gabany Preserve (Sonoma County)—PG&E-owned property that a private mitigation banking company had been developing as a commercial bank for Sonoma California tiger salamander. PG&E has been holding the property since 2019 while the ITP is being finalized. This site is 52 acres in total, with 49.9 acres proposed for conservation easement: 48.5 upland acres plus about 1 acre of breeding habitat for California tiger salamander.

- Morgan Territory (Contra Costa County)—PG&E-owned property totaling 334 acres. PG&E has been holding the property since 2017 while the ITP is being finalized. This site includes:
 - Alameda whipsnake habitat:
 - 36.4 species acres of “core” habitat.
 - 58.4 species acres of “perimeter core” habitat.
 - 240.8 species acres of “movement” habitat.
 - California tiger salamander habitat:
 - 0.4 species acre of “aquatic/breeding” habitat.
 - 299.3 species acres of upland habitat.
 - Moller Ranch (Contra Costa and Alameda Counties)—PG&E holds an option to purchase a conservation easement on this property, which equates to 193 acres. The property is slated to provide about 60 acres of California tiger salamander credit.

PG&E also intends to meet portions of its conservation goals utilizing CDFW-approved mitigation banks. Credits have been purchased from the following conservation banks; however, these credits have not been allocated to specific projects or activities yet.

- Ohlone West Conservation Bank (Alameda County)—60 multispecies acres purchased in 2018/2019. There are credits for Alameda whipsnake and California tiger salamander.
- Muzzy Ranch Conservation Bank (Solano County)—The purchased credits include 603.5 acres of California tiger salamander credit (600 upland and 3.5 acres of breeding).
- Oursan Ridge Conservation Bank (Contra Costa County)—Credit was approved in 2020 for 0.15 acre of Alameda whipsnake habitat.
- Margaret West CB (Sonoma County)—There are 2 acres of Sonoma California tiger salamander credit.

The compensatory mitigation plan would ensure that ~~mitigation~~ conservation is achieved on a larger, regional scale, which would benefit habitat. Specifically, a regional approach to mitigation provides permanent protection and management of lands that are large enough to support populations of the ITP-covered species. Mitigation of impacts on a project-by-project basis does not necessarily provide the opportunity for this landscape-level approach. The mitigation sites may require restoration or enhancement work, which would be considered a covered activity under the ITP. ~~Additionally, field protocols (FPs), HCP AMMs, and applicant proposed measures (APMs) would be implemented to reduce impacts on covered species.~~

2.6 System Overview

PG&E is one of the largest combined natural gas and electric utilities in the United States, serving more than 5.3 million electricity customers and 4.3 million natural gas customers in 50 of California’s 58 counties. Nearly 11% of its total service area lies within the nine Bay Area counties.

PG&E acquires natural gas in open markets and moves it (by means of compression) through a series of compressor stations prior to use or storage. Gas is distributed to individual residential and business customers via smaller, lower-pressure distribution pipelines, transitioning from high-

pressure lines to smaller, low-pressure lines via pressure regulators or gas pressure-limiting stations (PLSs). In the Bay Area, PG&E owns and operates a compressor station and 1,820 miles of transmission pipelines, which convey natural gas to 19,350 miles of distribution lines. On the electric side, high-voltage transmission lines convey power from generation plants to switching stations or substations, where power is redirected and transformed to lower voltages. Distribution lines carry the lower-voltage service to industrial, commercial, and residential customers. In the Bay Area, PG&E currently owns and operates 4,430 miles of electric transmission lines and 207 substations, which convey electricity to approximately 23,015 miles of distribution lines.

The majority of PG&E's Bay Area electric and gas transmission and distribution infrastructure was installed from the 1950s through the 1970s. Ongoing operations result in normal wear and tear, which also trigger the need to periodically test, maintain, and repair facilities. These activities ensure compliance with CPUC mandates concerning the siting, design, operation, and maintenance of public utilities in California, specifically CPUC General Order (G.O.) 95 (overhead electrical line construction), G.O. 112-E (construction, testing, operation, and maintenance of gas gathering, transmission, and distribution piping systems), and G.O. 131-D (planning and construction of electrical generation, transmission/power/ distribution line facilities and substations). As part of O&M, PG&E occasionally needs to install new or replacement structures to upgrade existing facilities or extend service to new residential or commercial customers.

2.6.1 Natural Gas Transmission and Distribution System Overview

PG&E's natural gas system consists of a transmission system and a distribution system. The transmission system in the Bay Area includes 16 primary gas transmission lines totaling approximately 1,820 miles of pipeline. The largest three transmission facilities in the Bay Area are Line 2 and Lines 300A and B, as described below.

- **Line 2.** This 115-mile-long (of which 13.3 miles are within the Bay Area), 12- to 20-inch-diameter pipeline runs from the Brentwood Terminal in Contra Costa County to the Panoche Metering Station in Fresno County.
- **Lines 300A and 300B.** These 502-mile-long (of which 42 miles are within the Bay Area), 34-inch-diameter pipelines run from the California/Arizona border near Needles, California, to PG&E's Milpitas Terminal in the Bay Area.

The gas transmission system transports natural gas in steel pipelines buried 3 to 4 feet deep (measured to the top of the pipe). Depending on the location and type of pipe, pipe diameter can vary from 8 to 42 inches. Gas pressure in transmission pipelines generally exceeds 60 pounds per square inch (psi). The Bethany Compressor Station in Alameda County maintains the gas pressure in the pipelines within the Bay Area.

The Bay Area gas distribution system consists of approximately 19,350 miles of both steel and plastic lines. Typically, the 0.25- to 24-inch-diameter lines are buried 2 to 4 feet deep. Gas pressure in distribution pipelines is generally less than 60 psi. Approximately 90% of the gas distribution lines are in urban areas. The transmission and distribution pipelines are buried in native soil; however, in areas of rocky soil, imported backfill is used to prevent potential damage to the pipes.

The ROW width for the natural gas system varies from 5 to 150 feet. PG&E owns less than 1% of linear ROWs in fee title; the remainder is in easements and franchise. Generally, PG&E has

nonexclusive easements that do not allow PG&E the rights to fence the pipeline corridors. PG&E obtains exclusive easements with the right to construct fences when security fencing is required for valve lots, compressor stations, and other aboveground facilities, or subsurface vaults.

2.6.2 Electrical Transmission and Distribution System Overview

PG&E's electrical system consists of a transmission system and a distribution system. The electrical transmission system in the Bay Area consists of approximately 4,430 miles of transmission lines. Bulk transmission lines (230 kV and 500 kV) are supported on steel-lattice towers or steel poles. Power lines with a 60 kV, 70 kV, or 115 kV capacity are most often supported by wood poles, but steel poles, tubular steel poles (TSPs), and lattice towers are also used in certain areas.

PG&E currently operates 207 transmission substations in the Bay Area. Power from high-voltage transmission lines is transformed to lower voltage at these substations. The in-line spacing of these structures varies. The height of conductors above the ground varies according to topography and the design of the transmission system. Generally, conductors on 230 kV and 500 kV systems are designed to maintain a minimum clearance of 30 feet above the ground. CPUC G.O. 95 dictates the design of electrical facilities. Conductor sag (the extent to which an electrical conductor can hang between poles and towers) varies and is dependent on the height of the towers or poles, the electrical load through the conductors, ambient air temperature, conductor type, and span length.

Transmission ROWs are of varying widths and generally are within easements that are negotiated with private landowners of private lands or public agency landowners of public lands. PG&E owns less than 1% of these ROWs in fee title; the rest are in easements. The ROW widths depend on circuit or line voltage, the number of lines per ROW, terrain, and other factors. The electrical transmission system includes a network of fiber optic communications cable associated with the Supervisory Controlled and Data Acquisition (SCADA) system. In addition, there may be cables owned by other entities located inside PG&E ROWs. For example, third-party fiber optic communications cables (for telephone, television, or internet) are typically installed on PG&E facilities, either above or below the electrical circuits.

PG&E's electrical distribution system provides links between most customers and the transmission system. Approximately 14,885 miles of overhead distribution lines extend through the Bay Area, and another 8,130 miles are underground. Wood or steel poles support the overhead distribution conductors. The electrical distribution ROW widths vary according to the system voltage, terrain, and other factors. The distribution system includes primary and secondary distribution lines that deliver electricity and distribution transformers that reduce voltage from distribution to utilization (i.e., residential or commercial) levels. Primary distribution lines carry three-phase AC power in the 2–50 kV range to street rail and bus systems as well as to industrial and commercial customers. Secondary distribution lines serve most residential customers with 120-/240-volt, single-phase, three-wire service, which provides electrical power for lighting and most appliances. Secondary distribution transformers can further reduce voltage to the required secondary voltage at or near a customer's service connection.

Insulators are positioned between support structures and conductors to support the wires and isolate energized conductors from potential grounding. Most insulators for transmission voltages are ceramic; non-ceramic insulators made of fiberglass rods and rubber shrouds also are used.

2.6.3 Emergency Work

Emergency work includes the same activities as otherwise described under O&M activities for the natural gas and electric systems, respectively, but it typically must be done immediately or under an abbreviated schedule to respond to a triggering event, such as an outage. It is defined in PG&E's Utility Procedure ENV-8003P-01 as

...a project or activity which includes but is not limited to emergency repairs to facilities necessary to maintain service essential to the public health, safety or welfare. Emergency work would be covered activities under the ITP. Emergency repairs include those that require a reasonable amount of planning where delay of project or activity would result in significant safety or environmental impacts. Furthermore, emergency projects include specific actions necessary to prevent or mitigate an emergency.

The emergency work is the same as other O&M activities; however, the difference is the timing and urgency of completing the work. Emergency work typically requires an abbreviated initial environmental review process, or none at all, as well as a post-project assessment to determine impacts and associated mitigation for the impacts of the covered activity.

2.7 Covered Activities

This EIR addresses impacts from issuance of the ITP for the three covered activities that would be conducted in accordance with CPUC requirements and for which PG&E is requesting incidental take authorization: (1) O&M; (2) minor new construction; and (3) habitat conservation and enhancement. Each of these covered activities is described below. PG&E's O&M and minor new construction activities would be covered activities under the ITP. These activities are associated with PG&E's gas and electrical transmission and distribution system, as mandated for public safety and reliable energy. The vast majority of O&M activities occur regularly and would affect less than 0.1 acre (approximately 66 by 66 feet) in each project location.

Typical O&M activities take 4 hours to 2 days to complete, although some larger activities take up to 3 months of work. ~~Minor new construction activities may take 3 days to 3 months for gas pipeline extensions and PLS, 5 days to 3 months for transmission line extensions and substations and 5 to 10 days for distribution line extensions.~~

~~The EIR addresses those O&M activities necessary for the safe and efficient operation of PG&E's gas and electrical systems. To meet the needs of customers and satisfy the CPUC's requirements to offer "adequate, efficient, just, and reasonable" service, PG&E must operate and maintain facilities and, in some cases, perform minor new construction for safe and efficient gas and electrical service. The EIR covers the three categories of activities that would be conducted in accordance with CPUC requirements and for which PG&E is requesting incidental take authorization: (1) O&M; (2) minor new construction; and (3) habitat conservation and enhancement. PG&E has maintained its electrical and natural gas infrastructure per CPUC regulations, including O&M, for over 30 years. As such, this EIR acknowledges that PG&E's ongoing O&M activities are part of the baseline conditions in the Permit Area. Against this backdrop, this EIR evaluates whether issuance of the ITP conditioning PG&E ongoing O&M and minor new construction activities in the Permit Area during the 30-year term of the permit, including habitat conservation and management activities required by the permit, would cause an incremental physical change to baseline conditions and a related substantial or potentially substantial adverse effect on the environment. As CEQA lead agency for~~

effect on the environment. As CEQA lead agency for the ITP, CDFW must evaluate, disclose, and adopt feasible mitigation for significant impacts associated with the ITP-covered activities.

The alpha-numeric coding system for the various O&M activities listed in the following sections is tied to PG&E's internal tracking system used throughout the state. Activities with a "G" refer to the natural gas system, while activities with an "E" refer to the electrical system.

2.7.1 Natural Gas System

2.7.1.1 Operation and Maintenance Activities for the Natural Gas System

G1. Patrols

Aerial Patrol

PG&E conducts aerial patrols of gas pipelines and associated facilities quarterly using fixed-wing aircraft that fly at an elevation of 500 feet. Helicopters are used periodically as needed.

Ground Patrol

Compliance with CPUC regulations requires periodic ground patrols of the gas transmission lines. On a quarterly to annual basis, PG&E conducts ground patrols of the pipelines and associated facilities on foot, with all-terrain vehicles (ATVs), or by using small trucks or SUVs on existing access and pipeline patrol roads. The purpose of the patrols is to observe surface conditions on and adjacent to the transmission line ROW and look for indications of leaks, ensure that pipeline markers are clearly visible, and record conditions that might affect safety and operation. Ground patrols also read gas meters.

Leak Detection Patrol

PG&E conducts leak detection patrol of the gas facility system at either 6-month or 12-month intervals. Leaking gas from pressurized pipelines can present hazardous conditions that must be corrected. The patrol is conducted on foot or by small trucks, depending on the terrain and accessibility. PG&E uses either a portable hydrogen-flame ionization gas detector or a laser-methane detector to sample air above the gas line to test for leaks.

G2. Inspections

Valves

Valves are located along all pipelines at different intervals depending on the size of the line and number of taps (i.e., point of interconnection of a similar diameter or smaller diameter pipeline) off the line. PG&E inspects valve sites along the pipelines and tests the valves three to four times per year. Light trucks are used on existing access and pipeline patrol roads. Valves are not marked but are located inside vaults or fenced areas and can be accessed by a two- or three-member maintenance crew. Crews lubricate valves as necessary, using a gun pump to apply either motor oil or grease (e.g., 1033 grease).

Telecommunication Sites

PG&E conducts routine inspections of telecommunication sites, which are used to monitor gas pipeline functions remotely, on a monthly basis unless problems are identified at specific sites. Light trucks use existing access and pipeline patrol roads, or PG&E uses fixed-wing aircraft.

Anode Beds

Anode beds are part of the cathodic protection system (CPS) and usually placed approximately every 10–20 miles along the pipeline. PG&E inspects cathodic protection every 2 months, or as indicated by the integrity management team, by checking the electric current at various Electric Test System (ETS) stations along the line and at anode bed sites. Simple testing instruments are used. Surveys of pipelines located within the Permit Area typically require 10 days to complete. Light trucks use existing access and pipeline patrol roads.

Pressure Limiting Stations

PG&E conducts routine inspections of existing PLSs every 2 months along transmission lines and annually along distribution lines. A single light truck uses existing access and pipeline patrol roads.

Land Surveys

PG&E periodically conducts land surveys of facilities and facility ROWs along the alignment. It is estimated that the entire gas transmission and distribution system is inspected once per year.

G3. Pipeline Remedial Maintenance and Internal Pipeline Inspections

G3a. Pipeline Remedial Maintenance

Remedial maintenance corrects erosion and vandalism problems and involves the evaluation of internal pipeline issues. PG&E performs remedial maintenance at approximately 100 locations per year. The majority of these locations are in upland land cover types, but some are in streams. Maintenance materials used for site-specific solutions to erosion problems may include biodegradable jute netting and, to a lesser extent, the periodic use of concrete, Ercon mats, or concrete pillow systems. The extent of concrete, Ercon mat, or concrete pillow system installation does not typically exceed 100 feet long or 50 feet wide on any stream. During such installation, PG&E complies with permits for work in waterways. PG&E installs concrete, Ercon mats, or concrete pillow systems at approximately one location per year.

Vandalism can affect any structures located above ground; it usually entails visual (e.g., graffiti) rather than structural impacts. Of the 100 sites maintained each year, PG&E estimates that only 10 will require fencing for protection from vandalism. Fencing these areas requires excavation for fence post installation; this action results in a 50- by 50-foot disturbance area for each fenced location and a 50- by 50-foot work area.

G3b. Internal Pipeline Inspections

PG&E inspects the internal coatings of its pipelines annually. Every 7 years, on average, each segment is inspected above ground by electronically measuring the integrity of the pipeline coating. Using technology such as magnetic flux leakage, PG&E inspects the pipeline with sensors to measure pipe corrosion, cracks, and indentations. During these procedures, the pipeline remains in operation. If problems are indicated, the pipeline is inspected internally using a pipeline inspection

gauge (pig) that is inserted into the pipe at an external launch and receiver point. No excavation is required. The pig travels throughout the length of the pipeline, employing robotically operated cameras to look directly inside pipes. Once the “pigging” data are analyzed, the inspection crew conducts a calibration test (i.e., excavates a bell hole) at two or three locations along the pipeline to confirm that the pigging results are accurate. The area exposed depends on the length of pipeline where the pig has indicated possible problems. If corrosion cannot be repaired, pipeline replacement is necessary.

PG&E internally inspects approximately 100 miles of pipeline each year, resulting in 50 inspection locations per year. On average, two or three calibration tests are conducted at each site along a 10-foot length of pipe, requiring a bell hole work area of approximately 10 by 10 feet along the exposed pipeline. Soil excavation, soil stockpiling, and construction vehicle travel are within the work area during the inspection.

For the purposes of estimating impacts, PG&E assumed that all internal inspections result in a section of pipeline that needs to be replaced, and that excavation, soil stockpiling, staging, and the use of construction vehicles would disturb a 50- by 50-foot work area. PG&E hydrostatically tests the new section of pipe and disposes of the water by discharging overland, using a baker tank, discharging to a sewer, or using other approaches. Before test water is discharged from the banker tank to the land or sewer, PG&E tests the water under the appropriate water quality permits.

G4. Compressor Station Upgrades and Maintenance

The Bethany Compressor Station is a 100-acre facility in eastern Alameda County and within the Permit Area. The compressor station occupies a developed and fenced site. Some routinely maintained natural land is present within the grounds, and approximately 17 acres of landscaped and natural lands surround the station. PG&E conducts inspections daily and performs maintenance and upgrades two times every couple of years. Typical maintenance tasks include overhauling compressors and engines, repairing and replacing piping, painting the station, and drilling or cleaning water wells. In addition, operations and air quality standards may require modifications or upgrades to station equipment. To make such improvements, PG&E acquires permits, as necessary, to meet these standards. Inspections, maintenance, and upgrades to the Bethany Compressor Station are within the fenced facility footprint. Access to the site is from existing roads. Crews mow a strip approximately 600 feet long by 20 feet wide outside the perimeter of the facility’s fence line once each year to comply with local fire standards.

G5. Pipeline Electric Test System Installation

The electric test system (ETS) is a component of the cathodic protection system. Units are installed 1–5 miles apart on pipelines to (1) determine protection system effectiveness by measuring conductivity, and (2) help crews locate the pipe prior to excavation. This technology precludes the need to systematically expose the pipe and physically examine it for signs of corrosion. The ETS consists of two wires (leads) that are welded to the pipe; the leads are exposed at the surface inside a 4-foot-tall, 4-inch-diameter plastic tube or valve box. Installation entails exposing a 3- to 5-foot-long section of pipe, attaching the leads with a small weld, and recovering the pipe. During ETS installation, the pipeline remains in operation. Most sites are accessible from existing access roads. Where an ETS is not accessible from an existing road, workers access it on foot or by use of small trucks.

PG&E performs approximately seven ETS installations per year. At each installation site, soil excavation, soil stockpiling, and the use of construction vehicles disturb an approximate 50- by 50-foot work area.

G6. Pipeline Valve Maintenance—Recoating

As part of activities G10, Pipeline Coating Replacement, and G11, Pipeline Replacement, PG&E may need to recoat a gas pipeline valve. Mainline valves, which are generally 7 to 20 miles apart, regulate the flow of gas through the pipeline and enable crews to isolate portions of pipeline. Occasionally, these valves malfunction or wear out, causing leaks. Depending on the condition of the valve, PG&E will either recoat or replace approximately five valves annually. Recoating is done by sandblasting the valve over tarps, collecting the debris, and recoating the valve with a specialized epoxy that protects against corrosion.

G7. Pipeline Valve Maintenance—Replacement or Automation

As part of activities G10, Pipeline Coating Replacement, and G11, Pipeline Replacement, PG&E may replace a gas pipeline valve. Mainline valves, which regulate the flow of gas through the pipeline and enable crews to isolate portions of pipeline, occasionally malfunction or wear out, causing leaks. PG&E also replaces valves to allow for the passage of inspecting devices (i.e., pigging for in-line inspections). To ensure overall pipeline system safety PG&E will be automating valves and, when automation is not possible, replacing valves. Enhancing or replacing approximately eight of the valves per year may include an aboveground valve, several small cabinets for a SCADA system, and electric service extension. Mainline valves are generally 7 to 20 miles apart.

Prior to replacing or installing valves, a portion of the gas line must be blown down. Valves are replaced within the existing station facility corridor. If PG&E replaces a small section of the pipeline during valve placement or automation, the pipeline must be hydrostatically tested. PG&E may replace or automate valves at any time, depending on weather and on operational restrictions related to the need to temporarily shut down the pipeline.

Estimated disturbance areas include the anticipated need for facility upgrades and fencing at 10% of the valve locations, which expands the footprint to a 50- by 50-foot facility. Soil excavation, soil stockpiling, and the use of construction vehicles require an approximate 150- by 150-foot work area. A 50- by 50-foot laydown area to store equipment may also be required. Once the pipeline valves are automated, PG&E checks them annually to ensure that they work properly.

G8. Pipeline Cathodic Protection

Corrosion of underground steel pipes is a continual maintenance issue for gas system pipelines. Pipes generate or carry corrosion-cell current that, as it moves to the soil, can form pits in the pipe. These pits can weaken sections of the pressurized pipe and cause it to fail. PG&E uses cathodic protection to prevent corrosion.

PG&E undertakes approximately 100 cathodic protection activities per year using the methods described below. Of those activities, approximately 25 require excavation, and an estimated 20% (five total activities) are in natural vegetation. A work area approximately 100 by 10 feet wide is needed to install the cable, excavate the soil, stockpile soil, and house construction equipment. Most installations require 5 to 7 days to complete.

Anode Beds

As a pipeline's coating degrades over time, it requires increased cathodic protection to prevent corrosion. *Cathodic protection* is a technique to control pipeline corrosion by making the pipeline the cathode of an electrochemical cell. A cable rated for the expected current output connects the negative terminal of a *rectifier*, which is a small piece of equipment that is mounted on an existing utility pole, to the pipeline. A cathode protection expert adjusts the operating output of the rectifier to the optimum level after conducting various tests, including measurements of electrochemical potential. Pipe coatings commonly degrade faster in areas of high moisture content (e.g., locales with regular precipitation or irrigation) than in drier areas. Increased cathodic protection current accelerates the consumption of anode beds and decreases their effectiveness. Consequently, anode beds must be replaced periodically, and additional anodes may be needed. The pipeline continues to operate during installation or replacement of the anodes.

Galvanic anode cathodic protection is PG&E's preferred method for distribution facilities and for use in urban areas. Galvanic anodes do not require an external power source, and installation requires minimal excavation for installation. There is some flexibility as to where the anode beds can be located, with beds usually placed approximately every 10 to 20 miles along the pipeline. The installation of anodes typically can be accomplished in a single day.

Deep-Well Anode Beds

Deep-well anode beds typically have a 20-year life span and are abandoned in place when no longer in use. Installation of deep-well anode beds involves drilling deep ground wells (200–300 feet) and installing zinc or magnesium bars, platinum anode rods, or ground mats. PG&E uses this installation method where pipelines are exposed to large amounts of induced alternating current (AC) (typically from adjacent high-voltage electric transmission lines) or where soil conditions dictate. For many applications, the anodes are installed in a 200 to 300-foot-deep (or more), 10-inch-diameter vertical hole and backfilled with conductive coke (a nontoxic carbon material that improves the performance and life of the anodes). Once an anode bed is installed, it is connected to the pipeline and the electric line by an underground cable. The deep-well anode bed typically is located approximately 10 to 15 feet from the gas pipeline and every 10 to 20 miles along the pipeline corridor. In the Permit Area, a rectifier is the standard method PG&E uses to provide electricity. Installation of deep-well anodes typically requires 4 days to complete. Work crews evenly distribute leftover fill over the buried work site and grade it to blend in with the existing site, reserving topsoil to spread on top.

Other Types of Anode Beds

Other protection measures include the installation of cathodic protection units (CPUs), anode flex and magnesium anodes, and horizontal anode beds. Although deep anodes are preferable, these other measures can be used for certain soils or in isolated corrosion areas where installing a deep well is not practical.

Installation of CPUs involves trenching a few feet parallel to the pipeline and installing the flex or magnesium anode at the same depth as the pipeline. Trenching for CPU installation varies in width, from approximately 4 inches to 2 feet.

Horizontal anode beds are installed parallel to the pipeline, 400 to 1,000 feet from the ROW centerline, at approximately the same depth as the pipeline. The need to install or replace a

horizontal anode bed is relatively infrequent, and PG&E anticipates it will occur less than once per year in the Permit Area. A small underground cable delivers an electric current from the horizontal anode bed to the pipeline.

G9. Pipeline Lowering

PG&E may need to lower gas pipelines to increase the depth below surface and thereby improve public safety. The need for pipeline lowering arises mostly in agricultural areas and areas of intense land use, but pipeline lowering also may be needed in other land cover types or in waterways where pipe structures are exposed.

Pipeline lowering typically involves trenching and installing a new pipeline parallel to, and to a greater depth than, the existing pipeline. Typically, the old pipe is abandoned in place and either capped or filled with slurry and then capped. Pipeline lowering may be needed at any time of year, depending on operational restrictions related to the need to temporarily shut down the pipeline.

PG&E lowers approximately 1 mile of pipeline every 3 years. A 20-foot-wide work corridor is needed for trenching and soil excavation, soil stockpiling, and the use of construction vehicles. The pipeline requires hydrostatic testing prior to pressurizing the gas pipeline.

G10. Pipeline Coating Replacement

PG&E coats natural gas pipelines to protect them from degradation and external corrosion. When a pipeline's coating has deteriorated to the point of requiring replacement, PG&E recoats the pipe with epoxy. To determine whether the coating has maintained its integrity, PG&E induces an electric current on the pipeline at the ETS station and then measures for a loss of voltage, which would indicate degradation in coating integrity.

To avoid bending or affecting the integrity of the pipe, the pipeline must be excavated in sections and supported at intervals typically of 40 feet. Workers remove the old coating by jetting, scraping, or sandblasting and typically place plastic sheeting or tarps below the pipe to collect the residue. PG&E performs testing to determine if the material is hazardous and then disposes of it in accordance with regulations. The surface is then prepared for the new wrap by running a self-contained grit- or shot-blasting machine over the pipe. The pipeline continues to operate while a coating machine applies the coating.

PG&E recoats approximately 1 mile of pipeline every 5 years. This requires construction vehicles and includes vegetation removal, trenching, soil excavation, and soil stockpiling. On average, a 20-foot-wide work area is needed for this activity. The majority of recoating is in upland land cover types but may periodically be within streams. In intermittent and ephemeral streams, PG&E schedules instream maintenance when the stream is dry. One mile of pipeline coating replacement typically involves three different access locations.

G11. Pipeline Replacement

Public safety sometimes necessitates replacing sections of pipe for various reasons, including those listed below.

- Development alongside the pipeline has resulted in a change of class location.
- Aging or corrosion has affected the integrity of the pipeline.

- Pipelines have been damaged by private contractor(s) during construction (i.e., dig-ins).
- Acts of nature have damaged the pipeline.

In the case of class location changes, PG&E must move or replace the line with upgraded pipe to comply with regulations mandated by the California Department of Transportation and CPUC. PG&E uses standard pipeline construction techniques. As the old pipeline is removed from service for the tie-in to the new line, it is *blown down* (i.e., gas is evacuated to the atmosphere from the affected section of pipe through a blowdown stack). Any gas condensation is captured and removed from the old pipeline and disposed of in compliance with current regulatory standards. The existing pipeline is abandoned in place by filling it with slurry before the pipeline is capped. Typically, the crew will cut and cap the pipeline every 1,000 feet, depending on the location. Slurry is used if the pipeline crosses a water body or needs to be stabilized. In the event a pipeline is abandoned in place, PG&E will typically place the new section of pipe as close to the abandoned pipeline as possible and modify existing easements by expanding existing ROW or acquiring additional land rights.

PG&E performs pipeline replacement approximately five times per year. The length of pipe affected varies, depending on the reason for replacement. The minimum length of pipe replaced is typically 40 feet (one joint of pipe), although 8 miles could be replaced during each targeted replacement effort. Replacing an existing pipeline with a new pipeline includes clearing and grading the ROW, trenching and excavating the existing pipeline alignment, placing the pipe (including welding, inspecting the welds, field-coating or fiber-wrapping, and backfilling), performing hydrostatic testing, protecting pipes against corrosion, marking the pipeline, implementing erosion control measures, stockpiling spoil in the ROW, removing or abandoning existing line, and cleaning up and restoring the ROW. In general, the existing pipeline will be abandoned in place and filled with slurry and capped, although some of the pipelines will be removed and restored. PG&E may need to acquire additional ROW to accommodate an increase in the pipeline corridor for about 75% of the new pipeline. A 50- by 50-foot area for new valve equipment is required along each pipeline replacement. Trenching and soil excavation, soil stockpiling, staging, and construction vehicles disturb a 20-foot-wide work area, which includes the 10-foot excavation area. As the new pipeline is installed, PG&E hydrostatically tests the pipe, collects test water in a baker tank for discharge to land or a municipal sewer system (based on water quality, quantity, local conditions and relevant discharge or release requirements), and backfills the trench. Before test water is discharged from the banker tank to the land or sewer, PG&E tests the water under the appropriate water quality permits.

PG&E estimates that it will replace approximately 248 miles of pipeline during the course of the 30-year permit term. Of the 248 miles, approximately 75% (186 miles) are in urban areas where replacement would cause no disturbance to natural or agricultural land cover types. The remaining 62 miles are in nonurban areas. A new 10-foot-wide ROW above the pipeline alignment is required and could be in natural vegetation. Trenching and soil excavation, soil stockpiling, staging, and the use of construction vehicles require a work area, which includes the 10-foot-wide excavation area along the length of the pipeline.

PG&E may perform pipeline replacement at any time of year, depending on operational restrictions related to the need to temporarily shut down the pipeline. In the event that no access road exists or an emergency arises, construction of a temporary road that is estimated to be 0.5-mile in length by 12 feet wide may be necessary to implement this O&M activity.

G12. Pipeline Telecommunication Site Maintenance

A SCADA system monitors pipeline functions remotely and transmits pipeline operational information to PG&E's operations offices at the Brentwood Gas Terminal via PG&E's utility telecommunications system. Periodic vehicle or helicopter access is required to check the telecommunication facilities, replace batteries, conduct minor maintenance, or make adjustments to the facilities or components. In the event of major storm damage, reconstruction of the facility or replacement of a component is required as soon as weather permits. A staging area may be required for major maintenance or storm damage repairs. The staging area may be located either next to the site within the temporary work area or at a distant location (for helicopter transport of workers and materials). The pipelines continue to operate during site maintenance.

PG&E performs this activity approximately once per year. A 20- by 20-foot work area is needed for soil excavation, soil stockpiling, and the use of construction vehicles. Also, approximately once per year, PG&E must install new fiber optic cable, which requires an estimated 10- by 1,500-foot work area.

G13. Pipeline Right-of-Way Vegetation Management and Access Road Maintenance

G13a. Pipeline Right-of-Way Vegetation Management

PG&E manages vegetation along the pipeline ROWs to prevent damage to the natural gas system, facilitate inspections related to routine O&M tasks, and comply with state and federal regulations that require PG&E to patrol periodically for gas leaks. The gas system vegetation management program is designed to remove weeds, brush, and trees around equipment and facilities for ROW visibility, fire hazard reduction, security, safety, and maintenance access. Trees and brush that interfere with patrols or tree and brush roots that may pose a threat to buried pipelines may require periodic removal. PG&E also clears any tree canopy and brush that obscures the ROW to facilitate aerial inspections and maintain the line of sight between gas line markers. PG&E's ROW management associated with vegetation management focuses on the need to be able to patrol, inspect, and protect facilities. To keep incompatible vegetation from growing over the facilities, PG&E does not replant trees within the ROW after vegetation management, although reseeding—with the landowner's notification—is routinely performed.

PG&E identifies areas within the ROW that require vegetation removal during routine patrols. ROW width averages 20 feet over the gas pipeline and is dependent upon legal documentation. Maintenance width is dependent on the width of the easement. For example, some easements are 10 feet wide, and others can be up to 65 feet wide. Vegetation management usually is accomplished by manually removing (with a chainsaw) large-diameter woody vegetation, then mechanically removing other vegetation with a brush hog, hydro-axe, or brush rake, usually to establish a maximum clearance height of 1 foot from the ground (depending on vegetation and the return growth rate), and to allow surveys by foot. If access is poor, vegetation is manually lopped into 6- to 24-inch lengths and scattered within the ROW. PG&E also relies on chemical control (herbicides) for vegetation management.

PG&E uses herbicides in accordance with label requirements and U.S. Environmental Protection Agency (EPA) regulations, and herbicides are applied by a qualified applicator licensed by the ~~Department of Food and Agriculture California~~ California Department of Pesticide Regulation. In general, herbicides are used in the gas transmission ROWs and for cut-stump applications (where

PG&E has notified the landowner). Only federal and California EPA-registered herbicides are used. These include selective and nonselective, inorganic and organic, contact and translocated, and pre-emergent and post-emergent types. The use of herbicides is subject to landowner notification. PG&E contracts with licensed and registered pest control advisors to prepare herbicide prescriptions for vegetation control and eradication within ROWs.

The O&M activity described in this section is for those instances in which vegetation management is necessary as a distinct and separate action that PG&E crews perform, and not a part of ROW clearing necessary for other O&M activities, such as pipeline replacement. On average, there are 10 sections of ROW reclaimed per year by removing 10 feet of vegetation on each side of the pipeline over a 0.5-mile length. Ongoing vegetation management of the ROW disturbs a 20-foot-wide corridor averaging 1 mile in length. Frequency is based on an assumed return interval of 5 years within tree- and shrub-dominated land cover types.

G13b. Pipeline Access Road Maintenance

Access road maintenance work takes place in the ROW. PG&E maintains the road without altering the road profile. Every 2 to 3 years, PG&E performs surface maintenance on an as-needed basis to keep access roads in operational condition. At approximately five locations a year a temporary turnout that is approximately 45 feet in length and 10 feet wide is needed. If a culvert is replaced during maintenance activities, PG&E obtains additional required permits (e.g., U.S. Army Corps of Engineers [USACE] Clean Water Act [CWA] Section 404 permit).

2.7.1.2 Minor New Construction Activities for the Natural Gas System

G14. Gas Pressure Limiting Station Construction

Human population densities determine the class location designations of pipelines. A change of class location designation may require PG&E to move or replace a pipeline with upgraded pipe to increase safety, as mandated by CPUC.

An alternative to replacing the pipeline is installing a PLS that lowers the pressure of the gas in the line. A ~~typical~~ PLS is located within or adjacent to the existing ROW and typically encompasses a footprint area of approximately 250 by 100 feet, including aboveground pipe and valve structures and a small control/monitoring building (usually 100 square feet) surrounded by security fencing. The control building houses pressure flow monitoring and SCADA equipment. The local distribution system or solar panel-charged batteries provide the electricity for the SCADA equipment.

Installation of a PLS occurs approximately once every 5 years and involves excavating a pipeline joint. A construction corridor approximately 100 feet long by 100 feet wide and a laydown area approximately 100 by 100 feet may be required. In addition, the footprint of the PLS is approximately 250 by 100 feet, including fencing. In all cases, the work would disturb less than 1 acre of land. As part of the PLS installation, natural gas is cleared from a portion of the pipeline using forced air. Once the PLS is in place, the pipeline must be hydrostatically tested.

~~G15. New Customer/Business Pipeline Extension~~

~~To serve new residential or commercial gas customers, PG&E installs new pipelines as needed. Installing new sections of pipeline, up to 2 miles in length in natural vegetation, to existing segments involves clearing and grading the ROW, trenching and excavating, pipe placement (including~~

welding, inspection of welds, field coating or fiber wrapping, and backfilling), hydrostatic testing, corrosion protection, marking the pipeline, erosion control, and cleanup and restoration. In most terrains, trenching is used to install the pipeline, unless specific circumstances, such as an open crossing of a ravine or a similar small open area, dictate construction of aboveground sections. Specialized trenching and boring methods are used at crossings of rivers, streams, backwaters, washes, faults, roads, railroads, utilities, aqueducts, and canals.

PG&E installs new pipeline extensions approximately once per year. A new 10-foot-wide ROW over the pipeline alignment is required and could be in natural vegetation, city streets, or agricultural settings. Trenching and soil excavation, soil stockpiling, and the use of construction equipment require an approximate 125- by 20-foot work area, which includes the 10-foot excavation area on one side of the alignment. In the event that no access road exists or an emergency arises, it may be necessary to construct a new temporary access road to implement this activity.

2.7.2 Electric System

2.7.2.1 Operation and Maintenance Activities for the Electric System

E1. Patrols

PG&E conducts patrols of its lines and associated facilities annually or on more frequent basis as needed or required. Patrols alternate annually between patrols by air and patrols from the ground.

Aerial Patrol

PG&E conducts aerial patrols of electric transmission lines, distribution lines, and associated facilities biannually (in terms of calendar years) using helicopters only.

Ground Patrol

If electric transmission lines and associated facilities are located in no-fly zones, PG&E personnel conduct ground patrols on foot or with ATVs or use small trucks or SUVs on existing access roads. These patrols occur on a 2- to 5-year cycle, depending on whether the facility is wood or steel. Vegetation management personnel conduct biannual ground patrols of transmission and distribution lines by vehicle and on foot. It is estimated that 33.3% (7,664 miles) of the electric distribution system and 87.5% (3,876 miles) of the transmission system is patrolled each year. Approximately 95% of the patrolled system length is accessible from existing roads. The rest is patrolled on foot or by use of a helicopter. Approximately 5% (577 miles) of the electric system requires access by off-road travel using light trucks or ATVs.

E2. Inspections

Tower, Pole, and Equipment Inspection

PG&E routinely inspects tower footings and poles to verify stability, structural integrity, and equipment condition (e.g., fuses, breakers, relays, cutouts, switches, transformers, paint). Footings and poles are accessed from existing roads or may require off-road travel, either in vehicles or on foot.

Outage Inspection

When outages and CPUC Reportable Incidents take place because of weather, accidents, equipment failure, or other reasons, PG&E inspects lines to determine the location and probable cause of the outage. Lines are accessed from existing roads or may require off-road travel, either in vehicles or on foot.

Substation Inspection

PG&E inspects all transmission and distribution substations every 1 to 2 months to verify equipment operation and conduct safety inspections. Substations are accessed from existing roads in vehicles.

Telecommunication Sites

PG&E conducts routine inspections of telecommunication sites annually unless problems are identified at specific sites. Access is by light truck on existing access and power line ROW roads or by helicopter. Helicopter patrols are infrequent, and hovering typically lasts only a few minutes, allowing personnel to collect a Global Positioning System (GPS) point for the site or note the facility location.

Sections of Line

The regular inspection of underground facilities, instrumentation and control, and support systems is critical for safe and reliable operation. PG&E inspects aboveground components at least annually for corrosion, equipment misalignment, loose fittings, and other common mechanical problems. The underground portion of the line is inspected at vault locations annually. Inspections are performed from existing roads or may require off-road travel, either in vehicles or on foot.

Land Surveys

When new construction is proposed by a property or land developer, PG&E conducts land surveys of facilities and facility ROWs for construction layouts and other purposes. Data collected include precision measurements regarding length and slope and other geology-related information. Access is by vehicles on existing roads but may include off-road travel or surveys on foot.

E3. Insulator Washing or Replacement

Conductive airborne particles or bird droppings that settle on ceramic insulators can provide a conductive path across the insulators, causing contamination-induced electric faults. PG&E personnel periodically wash ceramic insulators to reduce the risk of such faults. Non-ceramic insulators tend to perform better in contamination-prone areas. Insulators are washed periodically to prevent faults using a truck- or trailer-mounted spray system or a helicopter. Washing typically is done during energized conditions (i.e., while the power lines are operating). Distilled water is used to wash the insulators; dry washing using ground corn hulls also is used.

PG&E replaces insulators when they have been damaged by gunshot, lightning, heavy corrosion or when they no longer can be washed. They can be replaced while energized or de-energized, depending on access, loading, and safety. Replacement typically takes a four- to six-person crew with a small truck for hauling crewmembers, tools, and materials. If access is limited, a helicopter

may be used to land crewmembers and tools on a tower. Insulators are washed or replaced approximately once per year.

E4. Substation Maintenance

Most of PG&E's substations are located near load centers, such as residential, commercial, and industrial areas. Typical minor maintenance tasks at these substations include repair and replacement of transformers, switches, fuses, cutouts, meters, and insulators. Maintenance of substation systems requires this type of work approximately once per year. Load demands may require modifications of station equipment or installation of new facilities. These O&M activities could require use of station property or adjacent property for construction staging, materials storage, permanent facilities, and land management.

PG&E conducts vegetation management inside and outside of substation facilities as required to meet CPUC and local regulations and ordinances, reduce and eliminate fire hazards, enhance security for fenced facilities, enhance aesthetics, and reduce potential for illegal dumping and homeless encampments. O&M activities on PG&E lands to control vegetation external to substations may include the mowing of grass and weeds. Treatments include pruning or removal of vegetation where needed inside or on the immediate perimeter of a fenced facility (usually within 3–5 feet of the fence).

Occasionally, public agencies, municipalities, or neighboring landowners ask PG&E to conduct additional fuels reduction activities on PG&E parcels outside of the fenced facility, usually for the purpose of improving or maintaining compliance with local and state fire codes. These activities, aimed at managing fire risk or public nuisances, may include brush and weed mowing and discing, herbicide treatments, tree thinning or pruning, and trash removal. Workers may use tractors, flail mowers, or string trimmers for mowing and discing operations. Tree service crews use chainsaws to manually prune or remove hazard trees and to cut brush. Herbicides may be applied, when appropriate, by use of vehicle-mounted spray equipment on tractors, ATVs, and pickups, or manually applied by backpack sprayer. Herbicide applications on special projects are prescribed by a California Licensed Pest Control Adviser and may include pre-emergent, directed post-emergent, and cut stump treatments. Substations are located primarily in residential, commercial, and industrial areas. No impacts on natural vegetation result within the fenced perimeters during maintenance because the grounds are paved with blacktop or gravel. An estimated 150 acres of PG&E property external to fenced substation perimeters is disced, mowed, or cleared of vegetation annually and is part of the baseline condition for sites that have been maintained annually. It is estimated that on an annual basis one of these substations has adjacent natural habitat, resulting in a 20- by 1,000-foot disturbance area.

E5. System Outage Repair

O&M activities involving outage repair are necessary to maintain reliable service and ensure public safety. Weather, equipment failure, accidents, fire, or bird electrocution are typical causes of outages. When an outage is reported, PG&E patrols the line until personnel determine the cause of the outage. Access is primarily on existing roads, although some overland access with small trucks or SUVs is expected. Depending on the cause of the outage, repair may entail anything from reclosing a switch to replacing a transformer or pole. Crews repair and restore circuits as quickly as possible.

PG&E performs outage repair approximately 500 times per year in rural locations throughout the Permit Area. Soil excavation, soil stockpiling, and the use of construction equipment disturb an approximate 22- by 22-foot work area during each repair.

E6. Tower and Boardwalk Replacement or Repair

E6a. Tower Replacement or Repair

PG&E tower replacement or repair typically involves tower extensions or strengthening the foundations or superstructures of towers. Superstructures typically are strengthened by replacement, modification, or the addition of pieces of steel lattice, as determined by engineering analysis specific to each tower. PG&E extends towers approximately 360 times annually.

Tower Extensions. The most common method to raise a tower involves installing a prefabricated extension at the bottom, waist, or top of the tower. The extension is typically installed using a helicopter or crane, depending on the tower location. If a crane is used, an approximately 25- by 40-foot area is graded adjacent to the tower to serve as a level crane pad. Temporary wood pole supports (shoo-flies) are constructed adjacent to the tower to support the conductors while the crane lifts the tower. The tower extension is installed, the conductors replaced, and the shoo-flies removed.

The second method requires lifting the tower. A tower lifter is driven beneath the tower, and its four arms are clamped to the tower legs. The tower legs are unbolted from the base, the tower is lifted, and leg extensions are installed.

Strengthening Tower Foundations. To strengthen tower foundations, concrete from the existing footings is broken away to expose the steel reinforcements. A new replacement concrete footing, called a grade beam, is poured between reinforcements. When the towers are accessible from existing roads, the old concrete footings are removed and hauled off-site on large trucks. For some project locations the old concrete footings are bagged in a giant tarp with ropes and bundled and taken by helicopter from the tower site and disposed of according to regulations, typically at a local landfill. To repair foundations submerged in water, such as in the San Francisco Bay, a cofferdam is installed at low tide to allow access to the foundation footing. The wood cofferdam is built around the footing to be repaired and is used to isolate the footing from the water. The mud is removed by hand, and the dam is pushed down to the required depth to expose the solid piling, usually 3 feet below the mud line. Typically, the mud is placed in bags and taken to a landfill. If there is little mud collected, then it is returned to the base of the footing after the cement is poured. The material is staged by helicopter or barge, or a combination of both. The old concrete pier is chipped away to expose the pile. New pins are inserted, a new rebar cage is installed around the pile, and the concrete is replaced. The cofferdam then is removed by excavating around the outside and hoisting it from the tower.

Where PG&E cannot complete the work from an existing boardwalk, construction crews place a rubber mat at the base of each footing as a work area. If a lot of material is needed at the job site, PG&E builds a temporary section of boardwalk laterally from the existing boardwalk. A helicopter is then used to place the material on the temporary boardwalk, and workers move the material to the work site by hand or wheelbarrow.

If piles are not required for the tower foundation, footing repairs can be done within a work area extending approximately 2 feet from the footing. If piles are required, the work area may need to be

extended to 20 feet outside the tower footprint. For a couple of hours, PG&E crews may use rubber mats to temporarily access the area requiring maintenance work. Workers place the mats in such a way to help protect the vegetation around the temporary boardwalk during its construction.

Strengthening Tower Superstructures. Superstructures typically are strengthened by replacement, modification, or addition of pieces of steel lattice, as determined by engineering analysis specific to each tower. Other minor repairs that require accessing facilities are replacing fuses, breakers, relays, cutouts, switches, transformers, and paint.

E6b. Access Boardwalk Repair and Replacement

PG&E has many miles of boardwalks that service transmission facilities in the vegetated margins of the San Francisco Bay. The boardwalks typically extend from levees and provide access across marsh and salt ponds to transmission tower footings. These boardwalks have a 15- to 20-year life and require repair and replacement. Approximately 15 times per year, 1,500 feet of boardwalk are repaired or replaced, which consists of installing replacement piles (spaced approximately 100 feet apart) and replacement planks. PG&E crews perform boardwalk maintenance and construction activities using hand tools and gas-powered tools such as drills and saws. Replacement piles are pushed into the ground using a steel bar for leverage and the weight of four people. The planking is transported along the boardwalk on special hand-dollies. Planking is slid into place, drilled, and bolted. If the boardwalk is not too degraded (i.e., still walkable), crews do much of the work from the boardwalk and some from adjacent to the boardwalk where piles are being replaced. If PG&E is raising the height of an existing boardwalk, crews do the work from the boardwalk. If the boardwalk is substantially degraded, crews do the work within a 10-foot corridor around the boardwalk being replaced. When a 10- by 10-foot work area is required, soil excavation and soil stockpiling disturb vegetation.

E7. Facility Installations (Shoo-Flies)

PG&E needs to replace or repair poles/towers and equipment (e.g., anchors, cross arms, insulators, wires, cables, guys, switches) when they fail or become unsafe. New additions to existing transmission line facilities or tap lines from the old facilities may require installation of a shoo-fly.

Shoo-fly installations involve adding temporary poles or structures around existing permanent facilities to limit service interruptions until work crews can make permanent repairs. Shoo-flies consist of a number of poles and anchors supporting conductors to bypass facilities needing repairs or upgrades. In some cases, existing conductors are removed from the old poles or structures and reattached to the shoo-fly structures. In most cases, this is accomplished with one or two poles for every circuit attached to the structure being shoo-flied. For example, one double-circuit 115 kV tower (six wires attached) requires a minimum installation of four poles. Shoo-fly supports are removed when the repair or construction work is complete. Shoo-fly installations occur approximately 100 times per year. A work area of approximately 25 by 100 feet is frequently required.

E8a. Pole Equipment Repair and Replacement

PG&E repairs or replaces pole equipment (e.g., cross arms, insulators, pins, transformers, wires, cables, guys, anchors, switches, fuses, and paint) when it fails, becomes unsafe, outlasts its usefulness, or is identified for replacement. Replacement and repair of pole equipment typically are

performed with the pole in place, using a line truck. Such repairs and replacements take place approximately 500 times per year.

E8b. Utility/Wood Pole Replacement

When replacing a PG&E distribution or transmission pole, the new pole is framed (i.e., cross arms, pins, insulators, grounds, bonding, markers, and any equipment are installed) on the ground adjacent to the existing pole prior to setting the pole in the ground. To replace a pole, the line is typically de-energized. A line truck augers a hole, the new pole is moved into the new hole, the conductors are moved from the old pole to the new pole, the old pole is typically removed, and the old pole site is backfilled with the augured soil. Existing wood poles may be replaced with new wood poles or light-duty steel poles. PG&E pole replacements take place approximately 500 times per year, requiring a 10-foot-long by 7-foot-wide work area.

E9. Line Reconductoring

PG&E replaces conductors (wires) once the wires have outlasted their usefulness. Work crews install replacement conductors by temporarily splicing them to the ends of the existing conductors and pulling them through travelers (pulleys) attached to the arms of the towers or pole cross arms. Travelers are installed at each tower or pole using a boom truck. Where a boom truck cannot be used, a winch is used to install the travelers. In some cases, a helicopter is necessary to install the travelers and conductors.

Reconductoring typically is done in 2- to 3-mile sections with the use of pull and tension sites (pull sites). *Pull sites* are temporary construction areas that are used during the removal of existing conductors and the placement of new conductors along the transmission line. Pull sites may also be used to stage materials and provide work areas for tower or pole work. Pull sites are typically located within relatively flat areas that are in line with the conductor. Several pieces of equipment are used at the pull sites, including tensioners (rope trucks) to feed out the new conductor and adjust tension, conductor reels to receive the existing conductor as it is removed, and reels of new conductors. Trailers pulled by semi-trucks, which also are parked on site, typically deliver and remove the reels. Onsite cranes move the conductor reels on and off of the semi-trucks.

Pull sites are generally rectangular and vary in size, from approximately 50 to 350 feet wide for small pull sites and approximately 100 to 1,250 feet long for large pull sites. Distances between pull sites vary, but on average, approximately 2.7 miles of conductor separates single pull sites or groups of pull sites. Vegetation mowing and minor grading may be required to prepare pull sites for use.

Before pulling the conductor, PG&E crews install clearance structures at road crossings and other locations (where necessary) to prevent conductors from contacting existing electric or communication facilities or passing vehicles. These temporary structures consist of wood poles. After the conductors are pulled into place, they are tensioned by pulling them to a predetermined sag and tension. The conductors are then permanently attached to the insulators and existing conductors.

Electric distribution reconductoring takes place approximately 250 times per year, and electric transmission reconductoring takes place approximately 10 times per year. One-third of all reconductoring work requires a pull site; the remaining reconductoring work requires installation and removal of travelers on a two-circuit line, resulting in disturbance. Electric transmission reconductoring also requires a 25- by 25-foot work area. Reconductoring and new substation

construction sometimes require separate CEQA review by the CPUC and issuance of a Permit to Construct (PTC) for substations and electric lines of less than 200 kV and a Certificate of Public Convenience and Necessity for major transmission line projects of more than 200 kV. However, CPUC G.O. 131-D contains exemptions from the formal permit requirements for many activities.

E10. Vegetation Management

PG&E performs routine vegetation management on all of its overhead electric distribution and transmission facilities to maintain compliance with Public Resource Code Section 4293, CPUC G.O. 95, Rule 35, the California Independent Systems Operator (CAISO) Transmission Maintenance Agreement, and Northern American Electric Reliability Corporation's (NERC) FAC-003-01 and 02.

The clearance regulations identify, by voltage, specific clearance distances that PG&E must maintain between vegetation and energized conductors. Minimum clearance distances range from 18 inches to 20 feet.² Vegetation removals for routine maintenance and reliability work generally involve individual trees or small groups of trees encompassing less than 0.1 acre (66 by 66 square feet) per event on an annual basis.

E10a. Routine Maintenance

Routine Maintenance. Routine vegetation management includes an annual patrol of vegetation growing near overhead distribution and transmission facilities. It also includes pruning or removal of trees that will not remain outside of required clearance distances or that may pose a hazard to electric facilities before the next year's patrol. Approximately 80% of the routine maintenance is pruning the trees to a clearance level dependent on voltage and regulations, and approximately 20% is removal of small in-growth or hazard trees.

This activity focuses on tree work outside of the minimum clearance distances on distribution line sections that have a history of high numbers of tree-related outages. This activity affects larger portions of the tree than other routine vegetation maintenance work. The goal is to increase public safety and reliability by reducing the number of outages by preventing power line contacts from tree or branch failures. PG&E prioritizes the distribution line sections that have the worst performance, as measured by either a high number of customers who have been without power or a high number of repeat outages. Once a line section is prioritized, personnel analyze the outage data to determine the pattern of tree decay that has historically caused vegetation-related outages and a vegetation-specific management prescription is written for trees along those line sections.

Enhanced Vegetation Management. This activity is currently focused on lines within high fire-threat areas, which are those noted as tier 2 or tier 3 on the CPUC fire threat maps. Work includes maintaining expanded clearances, eliminating overhanging branches, and removing hazard trees to reduce fire risk and ensure system reliability, as well as creation of fire defense zones in partnership with customers.

² General Order 95, Rule 35, including associated exhibits. Further, clearance distances take into account the growth rate of the vegetation in a year's time. So that PG&E has to perform maintenance only annually, pruning clearances include the average growth rate in the clearance calculations. For example, for vegetation with a clearance distance of 4 feet and a growth rate of 8 feet in 1 year, PG&E will clear 12 feet so that the clearance distance will be maintained after 1 year of growth.

E10b. Pole Clearing

PG&E performs pole clearing around subject poles on its overhead distribution and transmission facilities to maintain compliance with Public Resource Code Section 4292.

There are two subcategories of pole clearing: maintenance of previously cleared poles and maintenance of new poles that have never been cleared of vegetation. PG&E implements both subcategories of clearing annually. Vegetation clearing for existing poles applies to vegetation that has grown over the course of the year (e.g., grasses, forbs, saplings, and branches). Vegetation clearing for new poles requires the removal of all vegetation within 10 feet of a pole that could propagate a fire.

Approximately 100 new subject poles are cleared of vegetation in a 10-foot radius around the pole annually in natural vegetation.

E10c. Tree Removal—Small Groups

When appropriate—considering tree species, growth rates, site conditions, landowner notification, and appropriate permits—PG&E removes small groups of trees growing below overhead transmission and distribution facilities while conducting routine maintenance activities (E10a). Trees are removed in groups affecting approximately 0.1 acre (4,350 square feet) at approximately 25 locations each year. Trees are cut off at ground level, with the roots and stump left in place.

E10d. Tree Removal—Transmission ROW Clearing

PG&E uses an integrated vegetation management program to manage incompatible vegetation (tall-growing plant communities) and maintain low-growing diverse plant communities that are compatible with transmission ROWs. Properly maintained ROWs are essential for ensuring the safety of the public and workers, minimizing vegetation-related outages, providing access for the inspection and maintenance of facilities, and ensuring the timely restoration of service during emergency conditions. PG&E vegetation management staff prioritizes lines and line sections to be worked annually. Prioritization is based on a NERC-regulated line, line criticality, level of risk of an outage, vegetation density, and property ownership. Goals of transmission ROW vegetation management also include protecting the transmission system in the event of a fire, as well as preventing vegetation-caused fires.

NERC requires transmission owners to have a documented Transmission Vegetation Management Plan (TVMP). The TVMP needs to describe how transmission owners conduct work on their applicable active transmission line ROWs to prevent sustained outages due to vegetation coming into contact with conductors and causing vegetation-related outages leading to blackouts or cascading outages (Standard FAC-003-2). Compliance with the standard is mandatory, and if a transmission owner allows vegetation to encroach into the Minimum Vegetation Clearance Distance (imminent threat), steep fines can be levied. PG&E's TVMP is associated with ROWs for its critical transmission lines, which operate at 200 kV or more, and for some transmission line ROWs, which operate at less than 200 kV.

The first step of the integrated vegetation management program is to clear the ROW of incompatible vegetation (e.g., any vegetation growing within the ROW that has the potential to grow or fall into PG&E minimum clearance distances). ROW clearing typically is accomplished either mechanically or manually. However, because cutting or mowing can stimulate resprouting of incompatible vegetation, PG&E vegetation management staff monitors the ROW for resprouting and reinvasion by

incompatible vegetation. When resprouting and reinvasion does occur, staff manages the ROW to achieve the desired outcome. A number of factors are considered in selecting and implementing the appropriate management method or methods.

This covered activity is defined by those instances in which vegetation management is necessary as a distinct and separate action. The long-term goal of an integrated vegetation management program in the transmission ROW is to convert tall-growing plant communities to low-growing communities. Low-growing shrubs, grasslands, or plants are preferred at the belly of the span, which is the middle 50% of the line between towers or poles. Vegetation may be taller near towers. Management toward low-growing communities can be accomplished over a period of many years by selectively controlling incompatible plants while preserving low-growing shrubs, grasses, and plants. With proper management, the low-growing vegetation eventually can dominate the ROW and suppress the growth of the tall-growing vegetation, thereby reducing the need for future treatments.

ROW management is based on the concept of creating wire zones and border zones. The *wire zone*, which comprises the ROW area beneath the transmission wire plus 10 feet on either side, is managed for low-growing shrub-forb-grass plant communities (early successional). The *border zone*, which extends from the wire zone to the edge of the ROW, is managed for taller shrubs and brush communities (transition zone). This management concept is depicted in Figure 2-3.

At approximately 10 locations per year, PG&E removes 1 mile of vegetation in a 25-foot-wide area under the belly of the span and prunes the remaining vegetation in a 75-foot-wide area along all transmission lines from 115 kV to 500 kV. This estimated area is based on an assumption that PG&E removes most trees from under the belly of the span, and, depending on clearance requirements, leaves the trees near towers. In riparian areas, vegetation management is anticipated to be more targeted. Riparian vegetation clearing is not expected to extend beyond 1,000 feet in one continuous area, and 1,000 feet of clearing is anticipated only once every 3 to 5 years. Riparian removals for this activity are illustrated in Figure 2-4 and Figure 2-5. Low-growing trees that stay below the clearance distance height are compatible and are retained. If the trees are incompatible then they will be removed; however, the compatible understory vegetation will be retained.

E10e. Tower Cage Clearing

PG&E performs vegetation management around poles and towers on its overhead transmission facilities to maintain the visibility necessary to inspect the footings for structural integrity as required by the CAISO Transmission Maintenance Agreement. Managing vegetation around poles and towers also keeps the interior of the tower clear of woody vegetation. Vegetation management includes patrol of poles and towers and removal of all trees, tree seedlings, and any material that obstructs the ability to visually inspect the tower and pole footings. The work is scheduled throughout the year and the work type depends on the plant material to be removed. Vegetation management involves cutting vegetation with string trimmers or chainsaws, and treatment with herbicides to prevent regrowth, where appropriate. PG&E performs this activity approximately 80 times per year. Approximately 10% of the time (eight times annually), vegetation is pruned or removed within a 1,600-square-foot area.

E10f. Fee Strip Maintenance

To comply with city and county ordinances for fuels reduction and beautification, PG&E performs weed abatement work on PG&E-owned land under electric transmission facilities approximately once a year along a 1-mile ROW corridor. Work type and timing varies depending on requirements

defined in each local ordinance. Ongoing vegetation management includes removing material by chemical, mechanical, or physical methods, depending on the site conditions, environmental considerations, types of vegetation, and size of the area. Methods may include mowing, discing, and using string trimmers.

E11. Wood Pole Test and Treat

E11a. Inspection and Maintenance

PG&E identifies the line segments for inspection and testing based on age and condition of the utility assets. Staff evaluates all transmission and distribution wood poles that are at least 10 years old to determine whether they are suitable candidates for replacement, trussing, stubbing, or fiber-wrapping. Within a 3-foot radius around the pole, construction crews excavate 20 inches of soil and bore a minimum of three $\frac{9}{16}$ -inch holes at 45° angles to the axis of the pole. Each successive boring is 120° to the right and 12 inches above the previous bore. The shell thickness and circumference of the pole are used to determine whether the pole is a candidate for replacement or reinforcement. Inspection and maintenance takes place frequently, approximately 60,000 times per year. Approximately 10% (6,000) of these poles are in nonurban areas. The excavation of soil within the 3-foot radius of the existing pole results in minor disturbance.

E11b. Reinforcement

Approximately 180 poles (or 3% of the 6,000 wood poles in non-urban areas) that PG&E inspects will need reinforcement. Staff determines the type of reinforcement method—stubbing or trussing—after reviewing the testing results of an inspected line segment. Stubbing and trussing entail driving or setting a short steel truss or wood pole into the ground and attaching it to the existing pole to provide the support originally afforded by the pole butt. Fiber-wrapping is performed on poles that are not candidates for trussing or replacement. This entails fiber-wrapping the pole at or below ground level with a material that has been impregnated with preservatives to retard external deterioration of the pole. Excavation of soil within the 6-foot radius of the existing pole results in minor disturbance.

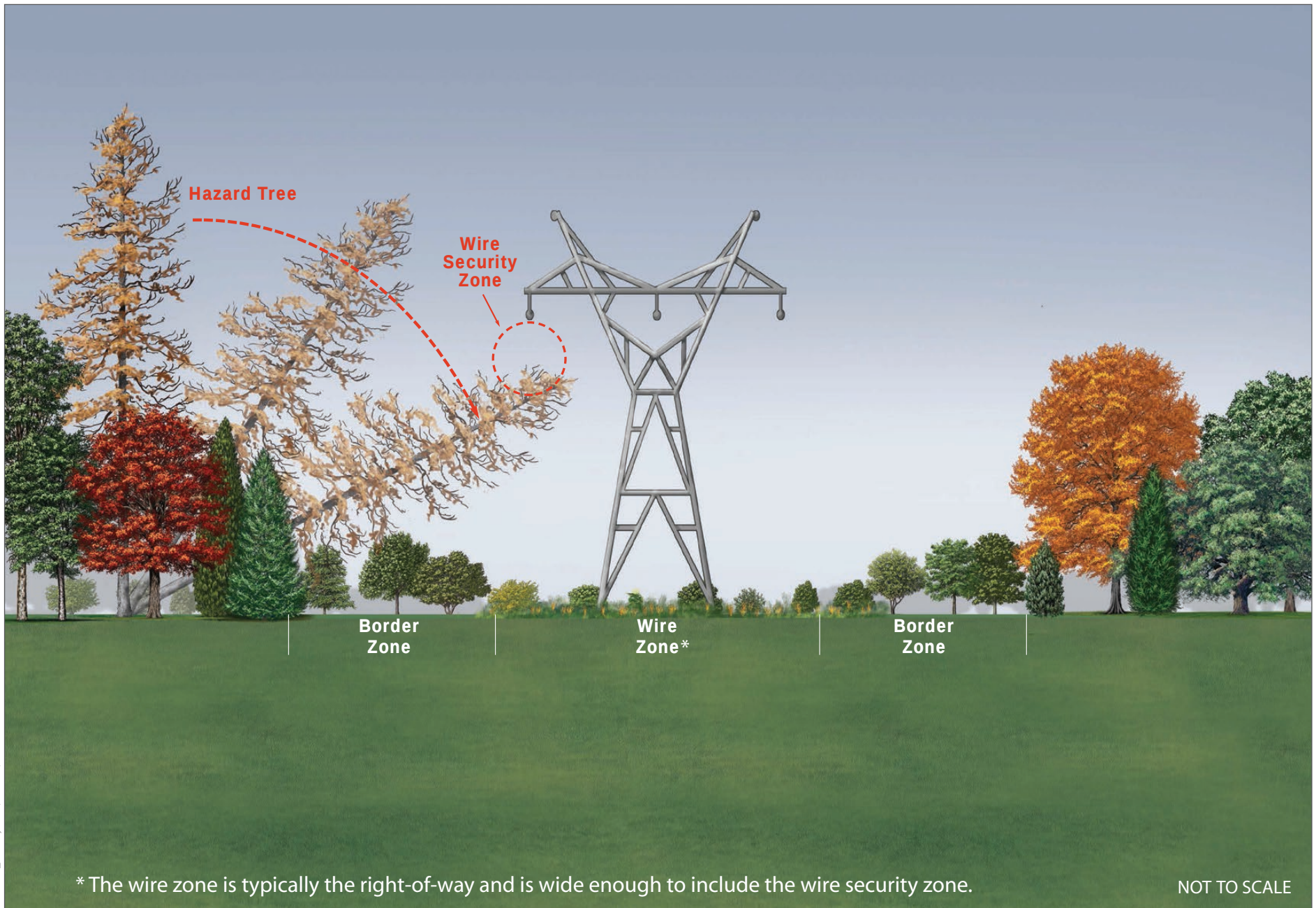
2.7.2.2 Minor New Construction Activities for the Electric System

~~E12. New Distribution and Transmission Line Construction~~

~~To provide additional service to residential or commercial customers, up to 2-mile extensions of distribution and transmission lines on new wood poles or light-duty steel poles are installed approximately twice per year. Each line extension requires the following:~~

- ~~• Typically, approximately 15 wood or direct-embedded light-duty steel or self-supporting steel poles per mile. Each work site is approximately 10 by 10 feet.~~
- ~~• A pull site of approximately 50 by 50 feet, or similar to the site necessary for electric line reconductoring.~~
- ~~• A staging area of approximately 75 by 75 feet.~~

~~Access to the new transmission or distribution section may require construction of a new 10-by-1,000-foot unsurfaced access road. Degraded or eroding access roads may need to be repaired or replaced. Once construction crews survey and stake the centerline for the new line, pole sites, pull~~



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Figure 2-3
Wire Zone/Border Zone ROW Management Concept

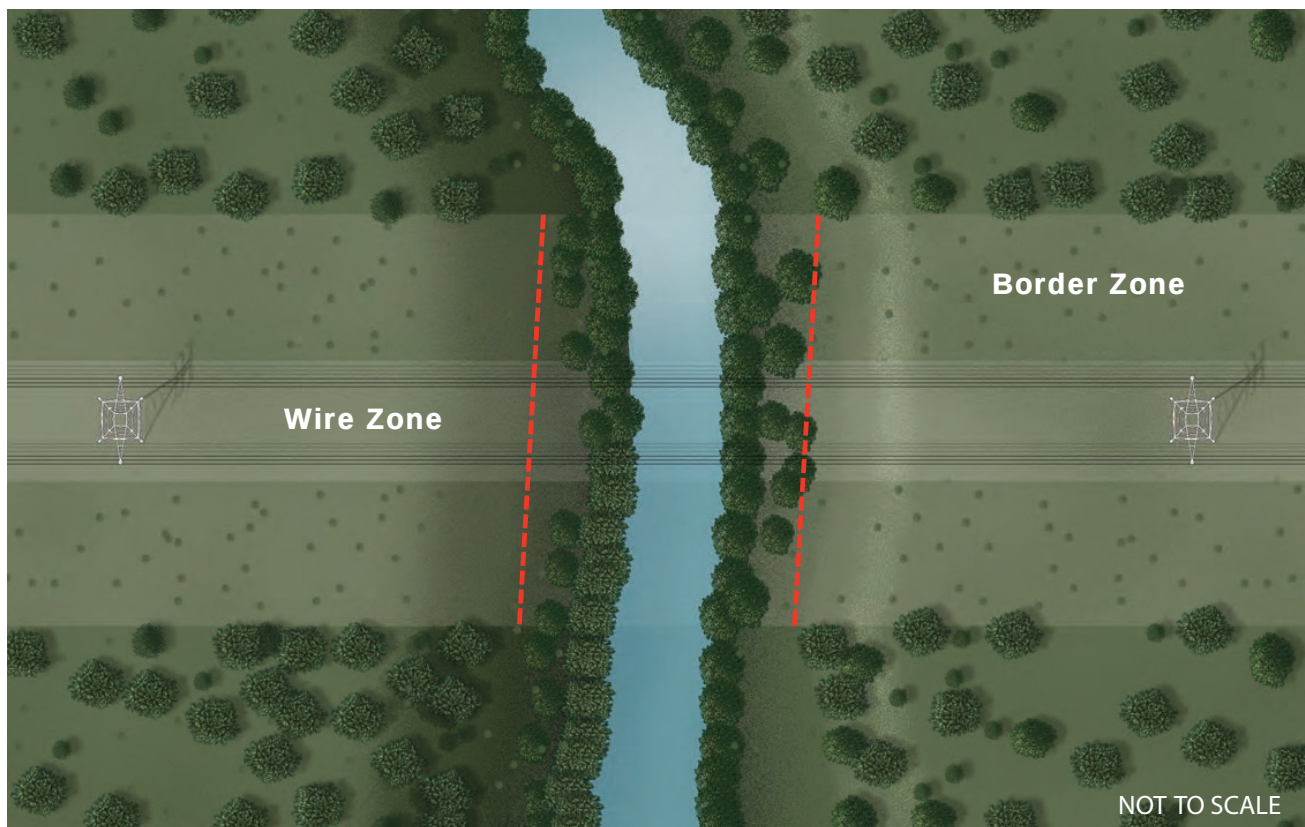
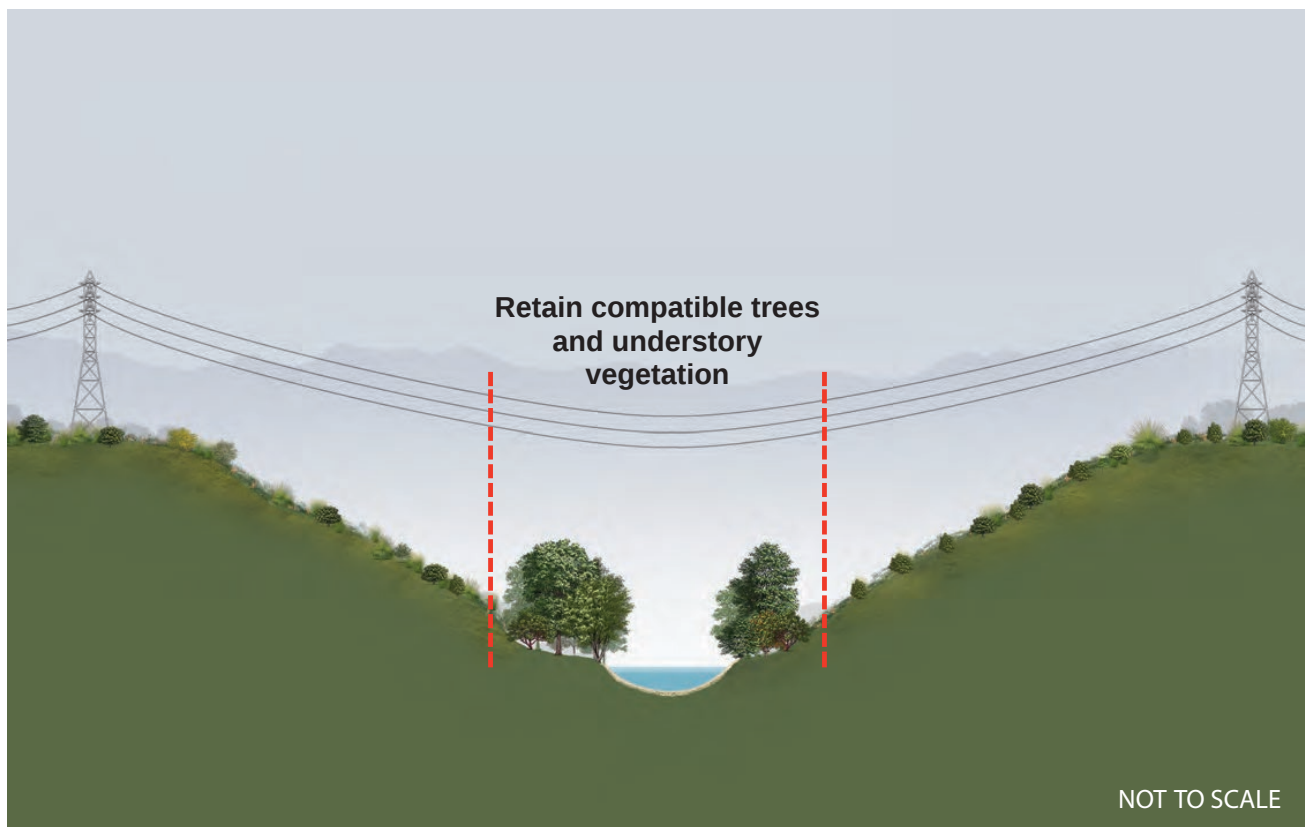
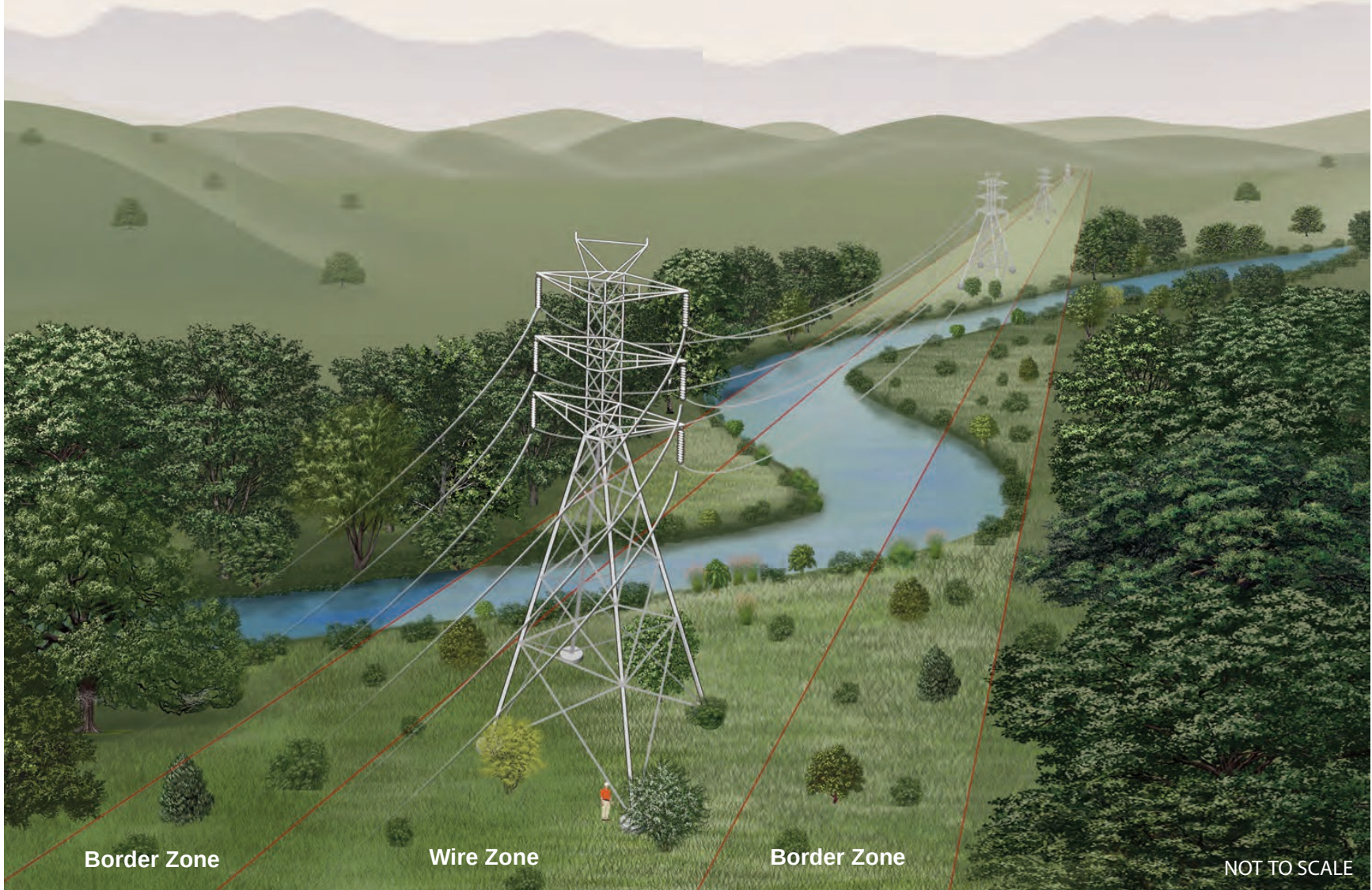


Figure 2-4

**Vegetation Management for Transmission Lines
Perpendicular to Riparian Areas**

Retain compatible trees and understory vegetation in riparian areas.



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Figure 2-5
Vegetation Management for Transmission Lines
Parallel to Riparian Areas

sites, access roads, and laydown areas are cleared, if necessary. PG&E uses a machine auger to excavate the site of the new pole and any necessary anchor holes. The width and depth of the setting hole depend on the size of the pole, soil type, span, and wind loading. Typically, minimum pole-setting depths range from 4 to 14 feet. Poles are framed (cross arms, pins, insulators, grounds, bonding, markers), and any equipment is installed. Any anchors and guy wires are installed before the pole is set. After the pole is set, conductors are strung.

Some distribution and transmission line construction is exempt from ordinary CPUC environmental review requirements for issuance of a PTC or Certificate of Public Convenience and Necessity. For example, a PTC is not required for construction of power line facilities or substations that would be located in existing franchise or on company-owned property, respectively.

E13. Tower Line Construction

To provide additional service to commercial or industrial customers, approximately twice per year during the permit term, PG&E may obtain coverage under the ITP for up to 2 miles of new transmission lines in undisturbed, natural vegetation as an extension from existing transmission lines. These new lines are supported by steel lattice towers, light-duty steel poles, or TSPs with concrete foundations. Each line requires the following.

- A new ROW (maximum of 200 feet wide) no longer than 2 miles.
- Approximately 10 towers or poles, each requiring an approximately 25 by 100 foot work site.
- Three pull sites with an average size of 50 by 150 feet.
- A laydown area of approximately 100 by 100 feet.

Once land survey crews survey and stake the centerline for the new line, tower sites, pull sites, access roads, and laydown areas are cleared, if necessary. Crews excavate an area 25 by 100 feet for the foundation and concrete footings are poured. A crane or helicopter is used to erect the towers, depending on the tower type. After towers are erected, conductors are strung. Environmental review by the CPUC is generally not required for tower line construction in existing franchise or for other work that is exempt under CPUC G.O. 131-D.

E14. Minor Substation Expansion

Substations typically are constructed close to residential, commercial, or industrial development but may be located in areas surrounded by agricultural or natural vegetation. Substation expansions would occur adjacent to existing substations. Although this activity is infrequent, PG&E estimates up to 3 acres of permanent potential habitat loss per substation expansion attributable to the substation footprint. This construction footprint may be required for additional transformers, fencing, and new distribution line outlets. The expansion area also may be used for setbacks, landscaping, and access. PG&E grades, paves, or surfaces the substation sites and fences the area for safety and security reasons. This EIR assumes ITP coverage for five electric substation expansions over the 30-year permit term. Permitting and environmental review by the CPUC is not required when PG&E already owns the property or where the high-side voltage does not exceed 50 kV.

E15. Underground Line Construction

Underground line construction is conducted predominately in roadways in urban and high fire-threat areas settings. For both transmission and distribution lines, underground cable installation is

accomplished using a cut-and-cover construction method (open trenching) for the underground power line, duct banks, and splice vaults. For this activity, the construction specifications for a 115 kV transmission line were considered as the average size; however, construction area dimensions vary with the voltage capacity of the line and are frequently smaller than those necessary for constructing a 115 kV line. Although this width varies, typically, a minimum access width of 65 feet is required to allow for the trench excavation and construction of the duct bank. The activity construction area length varies based on the length of the line. During construction, trench excavation spoil is removed and stored. If hazardous material is present, construction crews haul the material off-site and dispose of it appropriately. PG&E constructs underground lines within undisturbed natural habitat about once every 10 years. Under CPUC G.O. 131-D, environmental review by the CPUC is not required for conversion of existing overhead lines to underground facilities, for similar work in existing franchise, or for other work that is exempt under CPUC G.O. 131-D.

Duct Bank Installation

As the trench for the underground cable is completed, the crew installs the cable conduit, reinforcement bar, ground wire, and concrete conduit encasement duct bank. The duct bank typically consists of polyvinyl chloride (PVC) conduits that contain the underground cables.

The typical trench dimensions for installation of a single circuit are approximately 3 feet wide by 5 feet deep; however, trench depths vary, depending on soil stability and the presence of existing substructures. Dewatering, if necessary because of a high groundwater table, is conducted using a pump or well-pointing to remove water from the trench. Construction crews then pump the water into baker tanks and haul it away for proper disposal. Dewatering discharge would not be directed to the land or to water bodies near the work site. Once the PVC conduits are installed, thermal-select or controlled backfill is imported, placed, and compacted. A road base backfill or slurry concrete cap then is installed.

Vault Installation

Vaults are installed in urban areas within public utility easements at intervals that vary with the voltage capacity of the conductor. The vaults are used initially to pull the cables through the conduits and splice cables together. During operation, vaults provide access to the underground cables for maintenance inspections and repairs. Vaults are constructed of prefabricated steel-reinforced concrete and are typically about 20 feet long, 10 feet wide, and 8 feet deep. The total excavation footprint for a vault is typically about 22 feet long, 12 feet wide, and 10 feet deep.

Cable Pulling, Splicing, and Termination

After installation of the conduit, cables are installed in the duct banks. Each cable segment is pulled into the duct bank, spliced at each of the vaults along the route, and terminated at the bus structures (switchboard) inside the switchyards. To pull the cable through the duct bank, a cable reel is placed at one end and a pulling rig is placed at the other. With a fish line, a larger wire rope is pulled into the duct. The wire rope is then attached to cable-pulling eyes for pulling. To ease pulling tensions, a lubricant is applied to the cable as it enters the duct. Cables are spliced at vaults after they are completely pulled through the ducts. A splice trailer is positioned directly above the vault manhole openings for each access. At each end, cables will rise out of the ground on a transition pole and terminate at a bus structure in the switchyards.

Special Construction Methods

To minimize surface disturbance, horizontal directional drilling is the preferred method for conduit installation.

2.7.3 Habitat Conservation, Management, and Enhancement

As described above in Section 2.5, *Conservation Strategy*, as part of its conservation strategy, PG&E ~~will~~would conserve, manage, and enhance habitat for the ITP-covered species: California tiger salamander, Alameda whipsnake, and California freshwater shrimp. PG&E ~~will~~would provide an endowment for mitigation lands to address the management needs of conserved properties. Activities required for land management typically include vehicles use in or near upland habitat, regular pedestrian surveys or sampling, installation and maintenance of fencing, and use of handheld equipment to manage vegetation and invasive species and otherwise enhance or restore habitat. Where possible, PG&E will identify opportunities to enhance conservation lands for the benefit of the covered species. In the course of acquiring, managing, monitoring, or enhancing mitigation lands consistent with a CDFW-approved management plan, take of covered species could result. The ITP is intended to cover habitat management, monitoring, and enhancement activities carried out by PG&E and by independent land managers with whom PG&E has contracted to perform such activities, so long as the activities are consistent with the approved management plan.

2.8 Work Methods and Techniques

2.8.1 Natural Gas System Work Methods and Techniques

2.8.1.1 Access

Generally, facilities are located in areas where PG&E crews can use existing public and private roads to access the facilities' ROWs. Typically, pickup trucks or small sport utility vehicles (SUVs) are used to access the facilities. Rural private roads may be dirt or gravel and may require repair or improvements in order to make ready for use by heavy equipment vehicles. In the event that no road exists or an emergency arises, off-road travel or construction of a new temporary access road may be necessary. PG&E restricts speed limits to those deemed safe for site-specific driving conditions—typically not faster than 15 miles per hour—and may further restrict speeds if necessary. PG&E periodically creates temporary access roads when access to an O&M activity site is not readily available. Temporary access roads are typically required for larger-scale activities, such as installing new gas pipelines. Currently, PG&E does not know where all temporary roads would be located. However, as appropriate, PG&E's environmental staff sites all roads to minimize impacts on sensitive species and their habitats through PG&E's environmental screening process and implementing prescribed field protocols (FPs), AMMs, and BMPs to protect sensitive species and their habitats. PG&E creates temporary roads within a minimum impact area and may ultimately decommission them, restoring the area at the completion of the O&M activity. In some instances, however, temporary roads may be left in place on a permanent basis to provide site access for annual patrols or inspections. The O&M activity descriptions include discussion of construction of temporary access roads, as appropriate.

2.8.1.2 Staging

A staging area is typically required for large-scale O&M activities, such as pipeline replacement. PG&E determines the location of the proposed staging areas during the early planning stages of a project and strives to locate staging areas on developed or disturbed areas to avoid and minimize impacts on sensitive resources. If sensitive resources such as water bodies, wetlands, or sensitive habitat are present, a biologist demarcates the sensitive resources with flagging or temporary orange construction fencing before construction commences. PG&E typically uses larger trucks to transport pipes and equipment such as tracked vehicles (i.e., vehicles that run on continuous tracks instead of wheels). Crews park, store, and stage construction equipment in these designated staging areas. PG&E restores staging areas at the completion of the activity. The O&M covered activity descriptions discuss the specific sizes of the staging areas for each activity.

2.8.1.3 Clearing

Activities involving clearing, such as pipeline repairs, maintenance and replacement, are in keeping with PG&E's land rights (e.g., easement) and involve landowner notification. Additionally, in some circumstances, authorizations may be required from land management agencies. After staking the work area, maintenance personnel remove trees and brush (clear and grub such obstacles as rocks or tree stumps by mechanical means) within the ROW to the extent necessary to allow safe and efficient use of construction equipment.

2.8.1.4 Grading

PG&E limits grading to the area necessary to ensure the safe movement of construction equipment in the ROW and designs its O&M activities that involve grading to minimize impacts on natural drainage and slope stability. Construction footprint calculations include acres of potential impacts from grading. Where steep terrain requires the ROW to be graded at two elevations (cutting an upper elevation and filling a lower elevation, called *two-toning*), PG&E recontours such areas after construction to approximate pre-construction topographic conditions and implements erosion control measures to prevent runoff. If the disturbed area is greater than 0.1 acre of grassland habitat, PG&E crews also mulch, reseed, and fertilize the area.

Sometimes PG&E must temporarily install prefabricated bridges or culverts in the ROW or in access roads to ensure safe access and reduce environmental impacts in accordance with state and federal regulations. If the bridge is needed for only a short duration, then a portable bridge is assembled on site and secured with a crane to span the crossing. If a longer-term crossing is required, a culvert is installed after PG&E obtains all appropriate permits from the regulatory agencies.

During the grading phase, PG&E segregates topsoil from subsoil and windrows the topsoil within the designated work site. During periods of rain, soil piles are covered, consistent with applicable stormwater permits; PG&E also develops site-specific erosion and sediment control plans as necessary. The soil is typically covered with plastic sheeting secured with gravel bags or other weights no more than 10 feet apart to minimize the potential for erosion. Surface rocks, where present and useful for reclamation, are set aside with the topsoil windrow. If not reclaimed, the rocks are taken to a landfill. PG&E covers the pipeline by placing the subsoil over the pipe first and then spreading the preserved topsoil evenly over the graded area.

2.8.1.5 Erosion Control

PG&E reviews various types of erosion control and implements applicable BMPs identified in the *California Stormwater Best Management Practices Handbook* published by the California Stormwater Quality Association in 2015. For example, PG&E employs erosion control techniques to preclude pipeline washout, gully development, and sedimentation of local drainages. Standard erosion control measures may include installation of water bars along temporary or dirt roads, diversion channels and terraces to reduce erosion and runoff, ditch plugs installed in ditches to prevent washout, and other soil stabilization practices such as jute mats, wood mulching, straw mulching, and other methods described in the handbook. The methods selected depend on the situation and the condition of the site. PG&E uses permanent articulating cement ground mat systems (i.e., erosion control or *Ercon* mats) and riprap infrequently—on less than 100 linear feet of stream each year in the Bay Area—and only when other biomechanical methods cannot be used or when repairs are made to existing riprap structures. If biomechanical methods cannot be used or repairs to existing riprap are needed, PG&E uses the minimum riprap necessary to accomplish the activity and so that it ~~will~~ would not exceed a total of 100 linear feet per location. PG&E does not undertake vegetation removal, grading, or substantial alteration of drainage conditions when performing erosion control work.

2.8.1.6 Trenching and Excavating

The process of excavating the pipeline trench varies according to location, soil type, and terrain. PG&E conducts trenching and excavating in accordance with California Occupational Safety and Health Administration (Cal/OSHA) requirements for employee and public safety. Self-propelled trenching machines, hydrovacuuming equipment, or backhoes are used for trench excavation on moderate terrain. Trenches crossing waterways are excavated using a backhoe, dragline, or clamshell. PG&E typically schedules trenching for the summer, when perennial creeks are dry; otherwise, a tunneling method such as jacking and boring or horizontal directional drilling (described below) is used. In rare occasions when rock or rocky formations are encountered, tractor-mounted mechanical rippers are used to expedite excavation. In areas where mechanical rippers are not practical or sufficient, rock trenching equipment may be employed. The width and depth of the trench depend on the diameter of the pipe, soil type, terrain, and minimum depth requirements. Typically, the trench is 12 inches wider than the diameter of the pipe. The trench must be deep enough to achieve adequate soil cover over the pipe. The following minimum soil covers apply to the described areas.

- Uncultivated areas: 2.5 to 3 feet.
- Cultivated areas: 3 to 6 feet.
- Rocky areas: 1.5 to 2 feet.

In areas where it is necessary to trench through topsoil and subsoil, a two-pass trenching process is used. The first pass removes topsoil, and the second pass removes subsoil. Removed soils (*spoil*) from each excavation are stored in separate rows. This technique allows proper soil-profile restoration after backfilling. Windrows contain gaps at appropriate locations to prevent stormwater runoff from ponding. Bank stabilization methods depend on site-specific conditions, but work materials and methods are consistent with species conservation needs and in accordance with any acquired USACE CWA Section 404 and CDFW permits or agreements.

PG&E field crews implement other BMPs as needed to provide erosion control and to prevent construction runoff from entering nearby streams. In cultivated and improved areas and areas with thin layers of topsoil, it is sometimes necessary to remove and stockpile topsoil within the ROW until the trench is backfilled. This effort could last up to 3 weeks. The stockpiled topsoil then is distributed evenly across the disturbed portion of the ROW during cleanup.

PG&E crews clear the trench of loose rocks and, when necessary, provide imported material or other suitable bedding material as a cushion for the pipe. Backhoes are used to clean the trench after ripping, or, in extremely rare circumstances, blasting is implemented after other alternatives, such as rerouting, are exhausted. PG&E minimizes the length of exposed trench to the extent possible and provides access across the trench at convenient intervals for public safety.

2.8.1.7 Crossings

Boring and open trenching are typical construction methods for crossings (crossing types are described below). PG&E typically uses boring when crossing active waterways, railroads, and major roadways. The three most common boring methods are jack-and-bore, horizontal directional drilling, and microtunneling. The method selected is based on the crossing type, soil type, terrain, and type of facility being installed. PG&E generally avoids open trenching across a waterway unless the waterway is a dry or ephemeral stream.

Jack-and-bore. PG&E often uses this boring method (also referred to as *dry bore*) to cross major highway systems (all federal and state highways) and railroads, as well as places where open cuts are infeasible. Crews excavate each side of the crossing to accommodate the equipment (a boring auger). The displaced fill is either stockpiled or removed, depending on whether the area will be permanently affected or if PG&E will restore it following a temporary disturbance. Stockpiling is done within the ROW. The bore could be for a pipe ranging from 2 to 24 inches in diameter. Sacrificial pipe, the same size as the pipe being installed, typically is used as a sleeve for the boring auger. This sleeve is pushed under the crossing as the auger drills through the soil. The permanent gas pipe is then pushed through and attached to the sacrificial pipe. The pipe is cut in short lengths to accommodate the limited excavation area then welded to the inserted piece ahead of it and jacked into place. The average size of the excavation or trenching is 10 feet wide by 40 feet long. PG&E uses the same method if casing pipe is necessary. The casing pipe, sized larger than the carrier pipe, is installed as a sleeve for the boring auger. The gas pipe then is installed through the casing. Cased crossings have vent pipes that extend above ground, have cathodic protection, and are appropriately marked.

Horizontal directional drilling. Longer distances, typically more than 120 feet, can be drilled using this method rather than the jack-and-bore method. Directional drilling, which PG&E most often uses to cross large waterways, is the preferred method for conduit installation to minimize surface disturbance. The only excavations required are for mud pits at the drilling entry and exit points. Mud pits are approximately 6 feet wide by 6 feet long by 3 feet deep. The tunnel is drilled from surface to surface, and a registered engineer determines the pipe's maximum angle of deflection. Workers set up a drilling machine on one side of the crossing at the appropriate location. The auger drills at a predetermined angle from the surface elevation toward the crossing; the angle is prescribed to attain the correct depth below the feature being crossed. During drilling, a mud solution, typically bentonite, is pumped into the tunnel along with other nontoxic additives to maintain the tunnel's shape and integrity and to reduce friction during installation of the pipeline. Used or displaced mud solution is pumped out of mud pits and into collection tanks. After the

drilling machine pulls the pipeline through the tunnel, the pipe is welded to pipe segments on each side of the crossing. PG&E contains the soil removed during drilling within the mud solution and tests it for contaminants prior to hauling the solution off-site and disposing of it at landfills that accept such material. When drilling under streams, “frac-out” response procedures, discussed below, are often utilized for water quality protection.

Drilling fluid fractures, commonly called *frac-outs*, occur when the pressure of the drilling lubricant escalates, fractures the soil, and allows the drilling fluids to escape the bore. PG&E crews design and direct the drilling operation to minimize the risk of spills of all types. PG&E utilizes standard frac-out response procedures that outline standard precautionary measures to control and clean up escaped drilling lubricant. The frac-out response procedures include the following: a point-of-contact list in the event a frac-out or spill occurs, guidance for when drilling should occur (such as performing drilling during daylight hours so that the loss of bentonite or machine pressure can be visually identified), and a list of tools and equipment required on-site to clean up and remove the drilling fluid. The point-of-contact list also outlines the notification procedure to inform all agencies with jurisdiction of the waterway of the nature of the incident. In addition to permit conditions and frac-out response procedure guidance, projects that involve contingency planning for frac-outs may also involve preparation and implementation of a stormwater pollution prevention plan (SWPPP) that contains detailed methods and measures to avoid spills; in situations where a SWPPP is not required, PG&E implements BMPs as needed to provide erosion control and to prevent construction runoff from entering the streams.

Microtunneling. This is PG&E’s preferred method for stream crossings. PG&E also often uses microtunneling in extremely wet conditions where it is necessary to control the amount of soil being removed as the boring head progresses. Each side of the crossing is excavated to accommodate the boring equipment (i.e., a jetting head and suction equipment). Microtunnel excavation can be a trench as small as 10 by 40 feet or as large as 50 by 50 feet, depending on the required depth. A jetting head containing multiple high-pressure water jets is attached to the pipe being installed. Crews use plumbed or tanked water—not water from adjacent streams or rivers. Water forced through the jets dislodges the soil as the head is pushed, and the pipe is installed behind it. Suction equipment controls the amount of soil being removed to accommodate the forward progress of the jetting head and pipeline. Only the soil displaced by the pipeline is removed. PG&E crews capture water used during this process in baker tanks and dispose of it according to state and federal water quality regulations.

Open-trench waterway crossings. PG&E rarely uses an open-trench waterway crossing and does so only when a waterway is very small or seasonal. If PG&E uses the open-trench technique for waterway crossings, a trench is opened in the streambed using backhoes, backhoes on barges, clamshells, or draglines, depending on the streamflow characteristics. Flow is maintained at water crossings during construction using bypass piping and temporary cofferdams. At large rivers, spoil removed from the trench is stockpiled out of the water within designated work sites but not where it can re-enter surface waters. The pipeline is placed at least 6 feet below scour depth. A plug of unexcavated soil is left at each bank of the stream or river crossing to preserve the integrity of the streambank. PG&E crews do not remove these plugs until necessary for installation of the pipe. The entire length of pipe for the crossing is assembled as a unit, tested, and then placed in the trench. After installation, crews backfill the trench and the streambank, stabilize the soil through compaction, and restore the area to approximate pre-construction conditions. PG&E’s bank stabilization methods depend on site-specific conditions, but work materials and methods are consistent and in accordance with state and federal water quality regulations.

For safe construction, PG&E conducts hydrologic evaluations for any major planned crossings during the appropriate time of year, as required.

2.8.1.8 Crossing Types

River, stream, and backwater crossings. River crossing methods vary according to specific river characteristics, such as width, depth, flow, and riverbed geology. PG&E conducts construction in accordance with permits and agreements issued by USACE, CDFW, U.S. Fish and Wildlife Service (USFWS) (see Table 2-5 in Section 2.10), and other appropriate regulatory agencies. Projects may require separate review and approval in accordance with the terms of the specific permits or agreements. Pipelines crossing major streams and rivers are coated with concrete prior to installation to provide negative buoyancy and protection from erosion. PG&E installs temporary vehicle crossings for construction traffic only if an existing crossing, such as a bridge, is not available in the vicinity. Temporary vehicle crossings consist of culvert bridges, Flexifloats, or portable bridges.

Fault crossings. Where geologic studies suggest a high potential for ground rupture, PG&E designs the fault crossing to avoid overstressing the pipe in the event of differential movement. Designs of fault crossings vary, depending on the type of fault and the likelihood, amount, and potential consequences of expected fault displacement. To address the potential for fault displacement, the pipeline trench is widened and deepened to accommodate the anticipated fault displacements. The pipeline in the fault zone is completely suspended in granular bedding material to minimize the resistance of the trench backfill to displacement of the pipe. This method allows the pipe to remain fixed relative to movement of the trench as fault displacement takes place.

Road, railroad, and utility crossings. PG&E uses the open-trench method when crossing roads with light traffic and where local authorities or owners of private roads permit this crossing method. PG&E provides a temporary road detour to the shoulder of the road or a construction bridge consisting of plating for trenched thoroughfares. Boring or manually exposing the pipe or cable are generally the methods used to cross below underground utilities. Jack-and-bore is the typical boring method used at railroad crossings.

Aqueduct and canal crossings. Site-specific circumstances determine the construction method PG&E uses for crossing aqueducts and canals. In most cases, boring is appropriate. Where required or necessary, crews construct an aerial suspension system for the pipeline.

2.8.1.9 Pipe Placement

Large trucks transport lengths of pipe, valves, and fittings to the ROW or work area, and PG&E crews unload the materials. Crews typically assemble sections of pipe requiring angle joints in the field using prefabricated elbow sections so that the pipe conforms to the contours of the terrain. The pipe joints are welded, X-rayed, inspected, and field-coated to prevent corrosion. The material used for field coating depends on the location of the pipe.

Large trucks or track-mounted equipment lower the pipeline into the trench. Work crews bring this equipment to the O&M activity site on a truck. Typically, the old pipe is filled with slurry and abandoned in place or cut and capped. The trench then is backfilled with the excavated material. If the excavated material has too much rock for placing around the pipe, a rock-free material is imported and placed around and over the pipe to a depth of 1 foot. Surplus material is used to form an earthen crown over the trench and allow for settling of the backfill. All excavations and trenches

are compacted to be in adherence with the specific requirements at each location. The industry standard minimum compaction requirement for ROWs is 85%.

2.8.1.10 Pipeline Marking

PG&E crews install/replace identifying markers (i.e., paddles) over the centerline of the pipeline. These markers show the general location and direction of the pipeline, identify the owner of the pipeline, and convey emergency information in accordance with applicable regulations. Additional markers (fence post-like structures with attached signs) are placed on streambanks, not in waterways, and on roads, fences, public access crossings, and edges of agricultural fields. The markers are installed in alignment with the active pipeline. Special markers providing information and guidance to aerial patrol pilots also may be installed.

2.8.1.11 Hydrostatic Testing

PG&E conducts hydrostatic testing to verify the integrity of existing pipeline, replaced pipeline segments, and new customer/business pipeline extensions. Testing complies with requirements of CPUC, California Department of Transportation, Regional Water Quality Control Boards, and Cal/OSHA. PG&E most commonly uses water as the test medium, but compressed air or compressed nitrogen gas occasionally are used for testing small-diameter pipes. Testing pressure and duration are determined by pipe size, pipe specifications, pipe-wall thickness, and elevation. Prefabricated test heads are installed on the section of line to be tested. The section is then filled with water from an available source, such as a fire hydrant. Water can also be transported to the site by water trucks or sent through temporary aboveground water lines. Once the pipeline is filled, a hydrostatic pump is used to increase the internal pressure to the designed test pressure, typically 1.5 times the system's maximum operating pressure. The amount of water used in a hydrostatic test depends on the diameter and length of pipe tested. For example, hydrostatic testing for a 1,000-foot segment of pipe with a 21-inch diameter may require up to 18,000 gallons of water.

Upon successful completion of the hydrostatic test, pressure is reduced, and the water is expelled from the pipeline into Baker tanks, for temporary storage, using air compressors and a cylindrical foam "pig." Water testing and other procedures are performed in accordance with the Statewide Natural Gas Utility Discharge Permit, prior to discharge of water to land or other permitted areas for beneficial use (e.g., dust control or irrigation). During discharge of water, PG&E also implements its water quality BMPs in a manner consistent with local water quality considerations.

Each segment of pipeline tested is approximately 2 to 4 miles in length; approximately 60 of those segments are in urban areas. The remaining 40 tests would be in nonurban areas at a rate of five per year over an 8-year period. Soil excavation, soil stockpiling, and the use of construction equipment at each end of the pipeline requires an approximate 20- by 50-foot work area. An additional 100- by 100-foot laydown area and a staging area are also required at each end of the pipeline.

Hydrostatically tested pipelines may require a 100- by 100-foot staging area to position and store each baker tank.

2.8.1.12 Cleanup and Restoration

The final phase of pipeline installation involves cleanup and restoration of the ROW to achieve compatibility with preexisting vegetative conditions, in accordance with standard procedures approved by federal and state regulatory authorities. PG&E removes construction material and

recontours disturbed areas to their pre-project grade. Depending on the nature of the site and the type of installation that took place, several tasks may be involved in the cleanup and restoration. For example, placement of a pipeline or other infrastructure in a trench results in surplus soil that cannot be returned to the trench. The surplus soil normally is distributed evenly over the disturbed section of the ROW. If a property owner objects to this approach, the surplus soil is deposited at a PG&E approved local disposal site. Restoration of the ROW surface involves smoothing it with motor graders or disc harrows. Restoration may also require stabilizing slopes by recontouring, creating slope breaks or diversion ditches, or using dirt, sandbags, or other materials to stabilize the soil and direct runoff away from disturbed areas. On cultivated or improved lands, measures are taken to remove rocks and leave the ground surface in a condition satisfactory to landowners. If the disturbed area is greater than 0.1 acre of grassland habitat, crews also mulch, reseed, and fertilize, as needed and pursuant to landowner agreement. In the event a landowner does not agree to the proposed restoration, this impact would be considered permanent, and PG&E would provide mitigation. For some activities, restoration may not be implemented in certain areas, such as riparian areas, serpentine habitats, or blue oak woodlands where the ROW has become overgrown and operational requirements dictate that access to and through the ROW be maintained for annual patrols and inspections, especially at creek and river crossings. In those situations, PG&E would mitigate the impacts as permanent impacts if the impacts are within habitat for the species covered by the ITP.

2.8.2 Electric System Work Methods and Techniques

2.8.2.1 Access

Access to electric facilities is accomplished by using existing public and private roads to access the ROW to the maximum extent possible. However, PG&E must occasionally construct new temporary access roads when access to a work site is not readily available. As appropriate, PG&E's environmental staff sites all roads to minimize impacts on sensitive species and their habitats through early project planning efforts and through implementing prescribed AMMs to protect sensitive species and their habitats. PG&E constructs these roads within a minimum footprint area and frequently decommissions and restores these roads at the completion of the activity. In some instances, however, temporary roads may be left in place to provide permanent access for annual patrols or inspections. The O&M activity descriptions below include discussions of construction of permanent and temporary access roads, as appropriate.

2.8.2.2 Staging

A staging area is typically required for large-scale O&M activities, such as transmission line reconductoring. The specific O&M activity descriptions discuss the typical sizes of the staging areas.

2.8.2.3 Clearing

Activities involving clearing, when necessary, are in keeping with PG&E's land rights (e.g., easement) and involve landowner notification. Additionally, in some circumstances, authorizations may be required from land management agencies. Clearing for construction begins by staking the ROW. Maintenance personnel then clear vegetation, remove obstacles, and grade to the extent necessary to allow safe work practices and access. In the event that clearing of privately owned tree species is

necessary, construction personnel remove and stack the trees in accordance with the landowner's preference. Stump profiles are left as low as required for safe work practices and access. Stumps may be removed where appropriate. Debris generated during clearing of the ROW is either chipped and left on site or disposed of appropriately. In some instances, PG&E's easement documents dictate the methods for disposal.

2.8.2.4 Grading

PG&E performs grading to allow for safe work practices and access and to ensure the proper installation of electric facilities. PG&E also conducts grading to maintain the structural integrity of an electric facility that is being affected by soil movement. On steep terrain where the ROW must be two-tiered, PG&E restores the areas after construction to approximate pre-construction topographic contours.

PG&E segregates topsoil from subsoil and windrows the topsoil near the site to preserve topsoil. Surface rocks, if present and useful for reclamation, are set aside. PG&E collects unused rocks and hauls them off site to a landfill. PG&E restores graded areas after construction to approximate pre-construction topographic contours where possible and, if the impact area is greater than 0.1 acre, PG&E revegetates the affected area. The construction footprint calculations include areas potentially affected by grading.

Sometimes PG&E temporarily installs prefabricated bridges or culverts in the ROW or in access roads to ensure safe access and reduce environmental impacts in accordance with state and federal regulations. If a bridge crossing is only needed for a few hours, then a portable bridge is pieced together on site and secured with a crane to span the crossing. If a longer-term crossing is required, then PG&E installs a culvert after obtaining the requisite permits from the regulatory agencies.

2.8.2.5 Erosion Control

PG&E implements various types of erosion control and and/or measures identified in the *California Stormwater Best Management Practices Handbook* for gas and electric transmission and distribution facilities. Erosion control techniques are employed to preclude impacts on utility facilities (gas and electric) resulting from soil movement, gully development, and sedimentation of local drainages. PG&E uses standard erosion control measures that may include grading; installation of water bars along temporary or dirt roads, diversion channels, and terraces to reduce erosion and runoff; ditch plugs installed in ditches to prevent washout; riprap to repair or maintain bank stability; and other soil stabilization practices such as jute mats, wood mulching, straw mulching, and other methods described in the handbook. The methods PG&E implements depend on the situation and the condition of the site. Most erosion control work is small and contained within work sites. Larger erosion control efforts to repair or maintain bank stability, for example, are conducted on an infrequent, as-needed, basis. This work typically involves more extensive planning and permitting to gain the necessary approvals from relevant agencies. PG&E infrequently uses riprap and Ercon mats in the Bay Area—on less than 100 linear feet of streams each year—and only if other biomechanical methods cannot be used or when making repairs to existing riprap structures. The extent of concrete, Ercon mat, or concrete pillow system installation does not typically exceed 100 feet long or 50 feet wide on any stream. During such installation, PG&E complies with permits for work in waterways. PG&E installs concrete, Ercon mats, or concrete pillow systems at approximately one location per year. PG&E does not undertake vegetation removal, grading, or substantial alteration of drainage conditions when performing erosion control work.

2.8.2.6 Trenching and Excavating

The process of trenching or excavating for a new or existing underground electric line varies according to location, soil type, and terrain. PG&E conducts trenching and excavating in accordance with Cal/OSHA requirements for employee and public safety. See the *Crossings* subsection for more details.

2.8.2.7 Crossings

Boring and open trenching are typical construction methods for crossings of underground electric line construction. PG&E typically uses boring when crossing active waterways, railroads, and major roadways. The three most common boring methods are jack-and-bore, horizontal directional drilling, and microtunneling.

2.8.2.8 Cleanup and Restoration

The final phase of large O&M activities, such as electric transmission reconductoring, involves cleanup and restoration of the project site. The goal of restoration is to achieve compatibility with preexisting vegetative conditions, in accordance with standard procedures approved by federal and state regulatory authorities. PG&E removes construction material and recontours disturbed areas to their pre-project grade. Depending on the nature of the site and the type of installation that took place, several tasks may be involved in the cleanup and restoration.

2.8.2.9 Vegetation Management

Vegetation interference with electric lines is one of the most common causes of electric outages throughout the United States. Electric outages may occur when trees or tree limbs grow, fall, or in other ways make contact with electric lines. Outages may also occur when electric lines sag into vegetation below the lines because of increased load or ambient air conditions (e.g., high air temperature or wind). Vegetation that comes into contact with electric lines can also start fires.

PG&E responds to numerous vegetation-related outages throughout its service area each year. To address this problem and minimize the threat to public safety and system reliability, PG&E's *vegetation management* refers to maintaining required clearances between vegetation and electric lines and equipment, removing hazard trees, and other vegetation clearing activities to ensure system reliability and reduce fire risk.

When pruning vegetation, there must be enough clearance at the time of the pruning to ensure that the pruned vegetation does not grow back into the electric lines before the vegetation maintenance crews inspect the line on the next cycle. Pruning prescriptions depend on the location of the vegetation in relation to the line. If the vegetation is located adjacent to the line, limbs can be pruned along one side of a tree (i.e., side pruning). Vegetation growing under the lines is pruned using targeted directional pruning to redirect future tree growth away from electric lines. Dead, diseased, or dying trees (hazard trees) or targeted tree species that are growing too close to the line and that pose a particular threat to a line are felled. Most low-growing species are retained, except in areas where poles are cleared as required by regulation. The vegetation management program operates under the following regulatory requirements.

- **NERC Standard FAC-003-01.** Addresses all NERC-regulated overhead transmission electric lines.

- **NERC Standard Facilities Design, Connections, and Maintenance (FAC)-003-2.** Addresses the requirements to improve the reliability of the electric transmission system by preventing vegetation-related outages that could lead to cascading on critical electric lines operated at 200 kV or higher.
- **Public Resource Code, Section 4292.** Addresses clearances for poles and towers with specific types of equipment (subject poles) on distribution and transmission overhead electric facilities in State Responsibility Areas (SRAs) and some select Local Responsibility Areas (LRAs) during fire season.
- **Public Resource Code, Section 4293.** Addresses primary distribution and transmission overhead electric conductors in SRAs during fire season.
- **CPUC G.O. 95, Rule 35.** Addresses requirements for all primary and secondary distribution and transmission overhead electric conductors. Additional detail for high-threat fire areas is provided in the specific tables of Case 13 and Case 14 described in this rule.
- **CPUC G.O. 95, Rules 37 and 43:** Address the construction design (minimum ground-to-conductor clearances) of overhead electric facilities, and temperature and maximum electric loads, both of which effect maximum sag of the electric lines.

These regulations require compliance with varying line clearance distances and other construction and maintenance specifications. Prescribed clearance distances vary based on line rating, shrub and tree species composition, slope, regional fire risk/threat rating, and tree growth and movement, as well as sag and blow-out distances. *Sag* is the additional distance a line can sag toward the ground when it is carrying an electric load during hot weather. *Blow-out* is the additional distance a line can swing side to side under windy conditions.

PG&E also implements programs to reduce wildfire risk including enhanced vegetation management in CPUC-designated high fire-threat areas (tier 2 and tier 3) and creation of fire defense zones in partnership with customers.

2.8.3 Covered Activities ~~Ground~~ Disturbance Estimates

A summary of both gas and electric O&M and minor new construction activities and their average disturbance sizes is provided in Table 2-2. The alpha-numeric coding system for the various O&M activities listed in Table 2-2 coincides with the covered activities identified in Section 2.7, *Covered Activities*. The term *temporary impact* refers to impacts associated with PG&E's O&M and minor new construction activities that result in temporary alteration of existing vegetation, soils, topography, and hydrology for a period of days, weeks, or months, but no longer than 12 months. ~~The discussion of temporary impacts in this chapter differs from the analysis of temporary impacts as defined in Section 3.4, *Biological Resources*.~~

Table 2-2. Operation and Maintenance and Minor New Construction Activities in the Permit Area

Activity	Annual Frequency	Average Size—Temp. Disturbance per Activity (acres) ^a	Annual Temp. Disturbance (acres) ^a	Average Size—Perm. Disturbance per Activity (acres) ^a	Annual Perm. Disturbance (acres) ^a	Total Perm. Disturbance for 30-yr Permit Term (acres) ^a
Natural Gas^b						
Operation and Maintenance						
G1. Patrols ^c	1	0	—	—	—	—
G2. Inspections	1	0	—	—	—	—
G3a. Remedial Maintenance—Fencing	10	0.06	0.57	0.06	0.57	17.1
G3a. Remedial Maintenance—Ercon Mats	1	0.11	—	0.11	0.11	3.3
G3b. Internal Pipeline Inspection	50	0.06	2.98	—	—	—
G4. Compressor Station Upgrades and Maintenance	1	0.28	0.28	—	—	—
G5. Pipeline Electric Test System Installations	7	0.06	0.40	—	—	—
G6. Valve Maintenance - Recoating	5	0	—	—	—	—
G7. Valve Maintenance—Replacement or Automation	13	0.52	4.13	0.01	0.06	1.8
G8. Pipeline Cathodic Protection	5	0.02	0.11	—	—	—
G9. Pipeline Lowering	0.33	2.93	3.33	—	—	—
G10. Pipeline Coating Replacement	0.20	0.25	0.05	—	—	—
G11. Pipeline Replacement	13	2.44	31.12	4.24	14.84	445.2
G12. Telecom Site Maintenance	1	0.34	0.34	—	—	—
G13a. Pipeline ROW Vegetation Management	10	2.42	24.24	1.21	12.12	363.6
G13b. Pipeline Access Road Maintenance	5	0.01	0.05	—	—	—
Minor New Construction						
G14. Gas Pressure Limiting Station Construction	0.20	0.23	0.09	0.55	0.11	3.3

Activity	Annual Frequency	Average Size—Temp. Disturbance per Activity (acres) ^a	Annual Temp. Disturbance (acres) ^a	Average Size—Perm. Disturbance per Activity (acres) ^a	Annual Perm. Disturbance (acres) ^a	Total Perm. Disturbance for 30-yr Permit Term (acres) ^a
G15. New Customer/ Business Pipeline Extension	4	0.06	0.06	2.42	2.42	72.6
Subtotal Gas			68		30.2 27.8	906.9 834.3
Electrical						
Operation and Maintenance						
E1. Patrols	1	0	—	—	—	—
E2. Inspections	1	0	—	—	—	—
E3. Insulator Washing or Replacement	1	0	—	—	—	—
E4. Substation Maintenance	1	0.46	0.46	—	—	—
E5. Outage Repair	500	0.01	5.56	—	—	—
E6a. Tower Replacement or Repair (including Telecommunication Attachments)	360	0.02	8.26	—	0.41	12.3
E6b. Boardwalk Repair and Replacement	15	0.002	0.03	—	—	—
E7. Facility Installations (Shoo-Flies)	100	0.06	5.74	—	—	—
E8a. Pole Equipment Repair and Replacement	500	0	—	—	—	—
E8b. Utility/Wood Pole Replacement	500	0.002	0.80	—	—	—
E9a. Line Reconductoring—Transmission	10	21.52	215.22	0.036	0.36	10.8
E9b. Line Reconductoring—Distribution	250	0.002	0.57	—	—	—
E10a. Vegetation Management—Routine Maintenance	20	—	—	0.09	1.84	55.2
E10b. Vegetation Management—Pole Clearing	100	—	—	0.002	0.23	6.9
E10c. Vegetation Management—Tree Removal-Small Groups	25	—	—	0.1	2.50	75.0

Activity	Annual Frequency	Average Size—Temp. Disturbance per Activity (acres) ^a	Annual Temp. Disturbance (acres) ^a	Average Size—Perm. Disturbance per Activity (acres) ^a	Annual Perm. Disturbance (acres) ^a	Total Perm. Disturbance for 30-yr Permit Term (acres) ^a
E10d. Vegetation Management—Tree Removal-ROW Clearing	10	1.88	18.80	3.03	30.30	909.0
E10e. Tower Cage Clearing—Electric Transmission Structures	8	0.04	0.29	—	—	—
E10f. Fee Strip Maintenance—Electric Transmission Line ROW	1	3.03	3.03	—	—	—
E11a. Wood Pole Test and Treat—Inspection and Maintenance	6,000	0.0002	1.24	—	—	—
E11b. Wood Pole Test and Treat—Reinforcement	180	0.0008	0.15	—	—	—
Minor New Construction						
E12. New Distribution and Transmission Line Construction or Relocation	2	0.25	0.49	0.23	0.46	13.8
E13. Tower Line Construction	2	0.26	0.52	0.29	0.57	17.1
E14. Minor Substation Expansion	0.33	—	—	3	1.00	30.0
E15. Underground Line Construction	0.10	0.3	0.03	—	—	—
<i>Subtotal Electric</i>			261 <u>260</u>		38 <u>37</u>	1,130.1 <u>1,099.2</u>
Total Gas and Electric			329 <u>328</u>		686 <u>64.8</u>	2,037.0 <u>1.9</u> <u>33.5</u>

^a These acreages are estimates based on average historical sizes for ongoing O&M activities. They do not represent caps on actual impact sizes. PG&E did not multiply temporary impacts over the duration of the permit because this calculation creates an incorrect impression of residual disturbance. See Table 3.4-6 for total temporary and permanent impacts by covered species over the permit term.

^b As of 2017, PG&E no longer splits out Community Pipeline Safety Initiative (CPSI) activities from regular natural gas O&M activities. As a result, impacts no longer match up exactly with the impacts shown in the *Bay Area Operations and Maintenance Habitat Conservation Plan*. For example, CPSI G16, Pipeline Replacement, is now part of G11, Pipeline Replacement; CPSI G17 is now part of G7, Valve Maintenance—Replacement or Automation; and G18, CPSI Hydrostatic Testing, is part of G9, Pipeline Lowering.

^c Patrols are performed at either 6-month or 12-month intervals. Patrols may be performed on foot, with aircraft, or with vehicles. The activity size calculation assumes that the entire gas pipeline is patrolled at a minimum of once per year.

2.8.3.1 Variability of Implementation

The schedule for O&M activities varies—different types of equipment or facility components may be inspected regularly (daily, monthly, quarterly, annually, or less frequent schedule). However, the same equipment, facilities, or components also have a variable service life and require replacement when equipment becomes unserviceable or damaged due to weather or vandalism. Towers, conductors, or pipelines, for example, tend to have decades-long service life with infrequent replacement, although subcomponents of those facilities may require maintenance or replacement on a more frequent but difficult to predict schedule. PG&E often sets up temporary programs to consolidate and oversee similar types of work, such as facility access, vegetation clearing, or equipment replacements or upgrades. Further, variation is present across activities, as shown in Table 2-2, and in the approach to conducting work for larger activities (e.g., E9, line reconductoring). Large-scale activities may employ a mix of construction-related methods to complete an activity safely and efficiently. For example, even a relatively short electric transmission reconductoring effort may involve different approaches to access each pole or tower location because of variations in topography or vegetation. Different means of access can be used, depending on time, costs, and project need. Use of a helicopter to bring personnel or equipment to a project site is sometimes preferable to constructing a road for such purposes and can be used to save time, reduce cost, or avoid environmental resources. Therefore, PG&E relies on the ability to adapt to variable situations to perform its O&M and minor new construction work.

PG&E's O&M activities are also guided by regulatory obligations under state and federal law to address system safety and reliability requirements. Therefore, O&M activities are sometimes initiated as a result of urgent situations, emergencies, or environmental factors (i.e., weather, accidents) and the resulting effects on the durability and condition of existing equipment. Under these circumstances, it may not be feasible for PG&E to modify its work locations, work equipment, work practices, or construction schedule (including the seasonality of work). The ITP would, in addition to addressing routine O&M activities, provide for such urgent, emergency, and weather circumstances and enable PG&E to fulfill its regulatory requirements when system reliability and public safety is at risk.

2.9 Overview of PG&E's Environmental Review Process

PG&E employs a large and diverse staff of environmental and regulatory compliance professionals whose primary roles are to ensure that activities are completed in compliance with applicable environmental and natural resource laws and regulations. This process is followed for all PG&E projects, including O&M, minor new construction, and larger projects, although it may be truncated or delayed for emergency projects. Environmental staff screens and reviews projects and activities when natural resources could be affected, and staff routinely identifies and prescribes standard BMPs that are implemented during PG&E's routine O&M activities.

~~Activities that would be covered by the proposed ITP are not necessarily subject to review under CEQA.~~ Most of PG&E's covered activities involve routine O&M activities that are not typically subject to review under CEQA. First, no discretionary permit may be required for the work. If there is discretionary permitting, the operation, repair, maintenance, or minor alteration of existing facilities is considered a Class 1 exemption under CEQA Guidelines Section 15301(b). Replacement or reconstruction of existing structures with no or negligible expansion is considered as a Class 2 exemption under CEQA Guidelines Section 15302(c). Much of PG&E's wildfire prevention work is

covered by the emergency exemption under CEQA Guidelines Section 15369. When there are exceptions to exemptions under CEQA Guidelines Section 15300.2, then formal CEQA review will be required.

When required, PG&E's environmental staff obtains ministerial and discretionary permits, and assists in implementing the corresponding permit conditions and BMPs. Sections 2.9.1 through 2.9.4 describe PG&E environmental staff practices for reviewing covered activities, with the goals of avoiding and minimizing effects on natural resources as a result of covered activities. To achieve these goals, PG&E's overall environmental screening processes can be categorized into four phases: project assessment, environmental screening and review, project refinement, and environmental release to construction (Figure 2-6). PG&E's measures to avoid and minimize impacts are described in Section 2.10, Project Measures to Reduce Impacts.

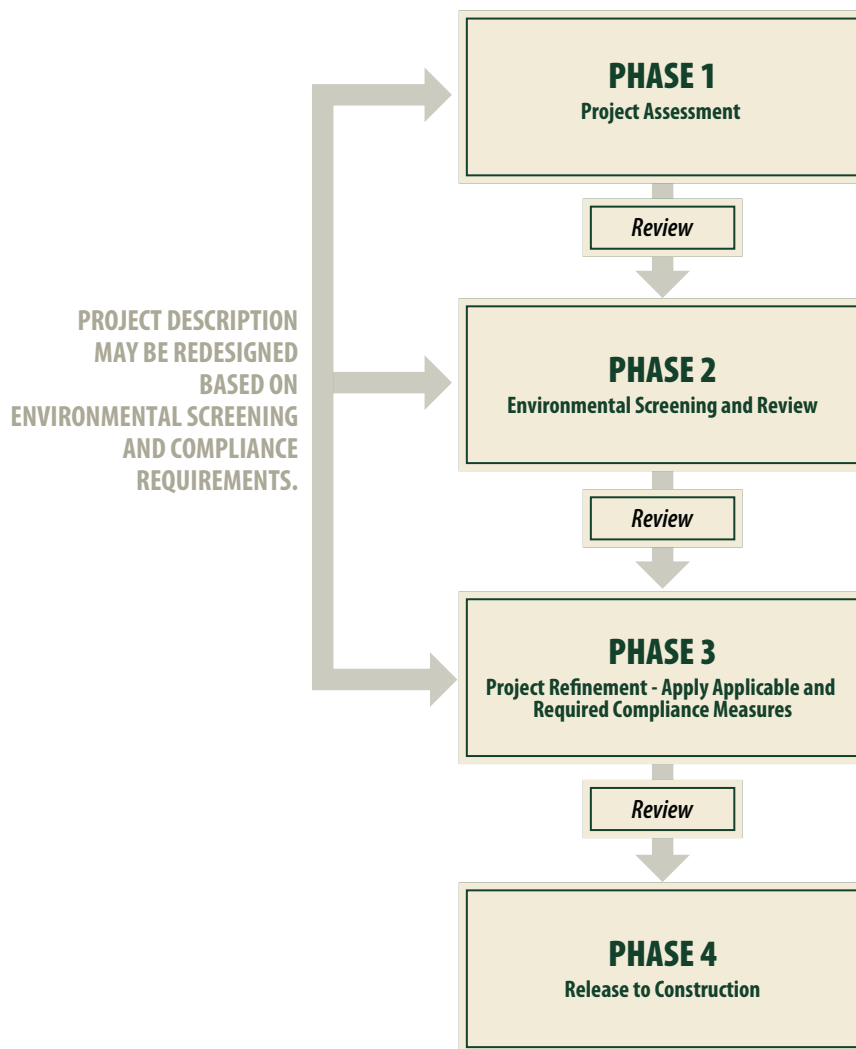
2.9.1 Phase 1—Project Assessment

Covered activities arise out of an extensive multi-year planning process that factors in the age of the facilities, life of the equipment, equipment conditions, wear, outage history, and other considerations. During the first phase, PG&E land planners and engineers evaluate a given project and begin developing the project scope and description. The level of detail in the project description varies based on the activity size (e.g., less detailed for small projects and more detailed for large projects) and an initial assessment of the site conditions and constraints. Typically, a project description for a large capital improvement project, such as electric reconductoring or gas pipeline replacement project includes an evaluation of site access, temporary construction areas, construction footprint, construction schedule, and outage schedule, with the ultimate goal of assessing the environmental impacts and potential discretionary permits and environmental review requirements. The time required developing the project scope and description varies from 1 day to greater than 1 year, with some projects taking 2 years or more for assessment and design because of required field surveys.

2.9.2 Phase 2—Environmental Screening and Review

During the second phase, PG&E's staff of land planners, biologists, cultural resource specialists, vegetation management staff, and environmental field specialists conducts initial environmental screening and review of the proposed project and associated work activities. Multiple environmental screening processes are used by the various staff members supporting the project depending on the line of business and type of work. Land planners review ministerial and discretionary permits as well as land rights. Land planners, vegetation management inspectors, and biologists conduct riparian screening for vegetation management activities. During the screening process, projects and activities are evaluated for potential impacts on wetlands, on state and federal waters, on species protected by the CESA or federal Endangered Species Act and other special-status species, and on the habitats for these species. PG&E staff verifies that the necessary land rights are obtained for both temporary and permanent easements. The environmental permitting process may also begin in this phase. Table 2-5 outlines the anticipated permits and approvals that could be required. PG&E maintains a comprehensive geographic information system to evaluate projects, and routinely uses this system to evaluate all aspects of a project's scope or description.

PG&E's Environmental Team routinely evaluates the impacts of proposed projects and recommends the appropriate avoidance, and minimization, ~~or mitigation~~ measures, based on best practices and permit requirements, as follows.



- For siting work locations, land use and planning practices to minimize impacts.
- Visual resource practices to lessen the visual impacts on a sensitive receptor.
- Biological resources evaluation and screening to minimize environmental impacts.
- Geology and soils practices to engineer facilities correctly and minimize erosion.
- Water quality practices to protect water quality.
- Cultural resources practices to protect cultural resources.
- Transportation and circulation practices to minimize traffic impacts.
- Noise and vibration practices to minimize noise and vibration impacts on sensitive receptors.
- Air quality practices to minimize air quality impacts and vehicle emissions.
- Hazardous materials practices to ensure the proper management, use, disposal, and storage of hazardous materials.
- Environmental justice practices to ensure minority communities are not adversely affected.
- Cleanup and restoration practices to ensure work areas are restored.
- Detailed project measures PG&E uses to address these resources are described in Section 2.10, *Project Measures to Reduce Impacts*.

2.9.3 Phase 3—Project Refinement

During the third phase, based on the results of the environmental screening and review, PG&E staff (land planners, biologists, field crews, and other specialists) identify appropriate AMMs and BMPs to avoid and minimize impacts from the activity. These AMMs, described in Section 2.10, are added to the project work as required conditions. These AMMs include environmental protection measures, applicant proposed measures (APMs), BMPs, FPs, and required compliance measures, such as permit conditions or agency agreements and mitigation measures. Based on this information and information from the second phase, the project may be refined or modified to minimize its impacts.

2.9.4 Phase 4—Environmental Release to Construction

The fourth phase is a release to construction review. PG&E staff implements an environmental release-to-construction (ERTC) process, or an equivalent procedure, to ensure projects and activities are reviewed for environmental constraints or restrictions, and all appropriate measures are included in the work plans. Work crews are given specific directions concerning permit conditions, BMPs, AMMs and other project requirements.

This screening process, in conjunction with PG&E's annual environmental awareness training and project-specific tailboard trainings, helps ensure that PG&E avoids and minimizes project impacts and complies with applicable environmental laws and regulations. Table 2-5 summarizes the range of permits and approvals that may be required for PG&E activities. While the ERTC process is primarily for large activities that would more likely have a potential environmental impact, many small activities are covered by PG&E's automated environmental assessment process or other line of business procedures.

PG&E frequently uses third party contractors to perform O&M and minor new construction work and is responsible for the performance of the work conducted by these contractors. PG&E requires third-party contractors to perform the following actions when applicable.

- Train employees and contractors performing O&M and minor new construction activities on the permit requirements that are applicable to their job duties and work.
- Enter into a new or revised contract with PG&E that contains enforceable provisions committing the third party to comply with provisions of the permit.

The ITP administrator would provide training and training materials for all PG&E crews and contractors to ensure compliance with environmental laws and regulations, including permit conditions associated with the ITP. The ITP administrator maintains a log of all personnel trained on the conditions of the ITP.

With issuance of an ITP, the downstream effects of the environmental screening process would not differ substantially from current practice (baseline), and ITP-related permit conditions issued by CDFW would be integrated into the review process and used, where appropriate, for covered activities.

2.10 Project Measures to Reduce Impacts

PG&E implements a suite of measures to avoid and minimize its impacts. These measures consist of its general practices, including BMPs, the AMMs from its Bay Area O&M HCP, and requirements imposed by applicable federal, state or local laws. The general practices, including BMPs, and legal requirements are set forth in the applicable impact chapters. The AMMs from PG&E's Bay Area O&M HCP that are applicable to the ITP are below in Table 2-3. PG&E has also proposed APMs for this project, which are listed in Table 2-4. ~~Finally, the project proposes to include one mitigation measure requiring compensatory mitigation for impacts on the covered species to ensure that any remaining impacts are less than significant under CEQA and to fully mitigate impacts on covered species under CESA.~~

Table 2-3. PG&E's Bay Area O&M HCP Avoidance and Minimization Measures Relevant to ITP

Field Protocols:	
FP-01	Annual worker training: Hold annual training on habitat conservation plan requirements for employees and contractors performing covered activities in the Permit Area that are applicable to their job duties and work.
FP-02	Vehicle parking: Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
FP-03	Access roads: Use existing access and ROW roads. Minimize the development of new access and ROW roads, including clearing and blading for temporary vehicle access in areas of natural vegetation.
FP-04	Off-road access and work sites: Locate off-road access routes and work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).
FP-05	Notice on conservation lands: Notify conservation land owner at least 2 business days prior to conducting covered activities on protected lands (state and federally owned wildlife areas, ecological reserves, or conservation areas); more notice will be provided if possible or if required by other permits. If the work is an emergency, as defined in Permittee's Utility Procedure ENV-8003P-01, PG&E will notify the conservation land owner within 48 hours after initiating emergency work. While this notification is intended only to inform the conservation land owner, PG&E will attempt to work with the conservation land owner to address landowner concerns.
FP-06	Pipe and culvert storage: Minimize potential for covered species to seek refuge or shelter in pipes and culverts. Inspect pipes and culverts, of diameter wide enough to be entered by a covered species that could inhabit the area where pipes are stored, for wildlife species prior to moving pipes and culverts. Immediately contact a qualified biologist if a <u>covered</u> species is suspected or discovered.
FP-07	Vehicle speeds: Vehicle speeds on unpaved roads will not exceed 15 miles per hour (mph).
FP-08	Prohibited activities at work sites: Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.
FP-09	Fire safety: During fire season in designated State Responsibility Areas, equip all motorized equipment with federally approved or state-approved spark arrestors. Use a backpack pump filled with water and a shovel and fire-resistant mats and/or windscreens when welding. During fire "red flag" conditions as determined by the California Department of Forestry and Fire Protection, curtail welding. Each fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C. Clear parking and storage areas of all flammable materials.
FP-10	Minimize work in potential habitat: Minimize the activity footprint and minimize the amount of time spent at a work location to reduce the potential for take of species.
FP-11	Erosion and control BMPs: Utilize standard erosion and sediment control best management practices (BMPs; pursuant to the most current version of Permittee's <i>Stormwater Field Manual for Construction Best Management Practices</i>) to prevent construction site runoff into waterways.
FP-12	Soil Stockpiles: Stockpile soil within established work area boundaries and locate stockpiles so as not to enter waterbodies, stormwater inlets, other standing bodies of water. Cover stockpiled soil prior to precipitation events.

Field Protocols:

FP-13	Open trenches or steel-walled holes: Fit open trenches or steep-walled holes with escape ramps of plywood boards or sloped earthen ramps at each end if left open overnight. Field crews will search open trenches or steep-walled holes the following morning prior to initiating daily activities to ensure wildlife are not trapped. If any wildlife are found, a biologist will be notified and will relocate the species to adjacent habitat or the species will be allowed to naturally disperse, as determined by a biologist.
FP-14	Revegetating disturbed habitat: If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial “weed free” seed mix. <u>(California annual grassland species will be used.)</u>
FP-15	Refueling and spill prevention: Prohibit vehicular and equipment refueling 250 feet from the edge of vernal pools, and 100 feet from the edge of other wetlands, streams, or waterways. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. Maintain spill prevention and cleanup equipment in refueling areas.
FP-16	Buffer from water features: Maintain a buffer of 250 feet from the edge of vernal pools and 50 feet from the edge of wetlands, ponds, or riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the land planner, biologist, or HCP administrator to minimize impacts by flagging access, requiring foot access, restricting work until dry season, or requiring a biological monitor during the activity.
FP-17	Tree removal: Directionally fell trees away from an exclusion zone, if an exclusion zone has been defined. If this is not possible, remove the tree in sections. Avoid damage to adjacent trees to the extent possible. Avoid removal of snags and conifers with basal hollows, crown deformities, and/or limbs over 6 inches in diameter.
FP-18	<u>Nests with eggs and/or chicks will be avoided; contact a biologist, land planner, or the Avian Protection Program manager for further guidance.</u>

Hot Zone Species-Specific AMMs³:

Hot Zone-1	California freshwater shrimp: Work will avoid pools and streams. Field crew will prevent any damage to the bank and streamside vegetation during placement or movement of materials on the stream banks. Streamside vegetation overhanging into pools or runs will, to the maximum extent practical, not be removed, trimmed, or otherwise modified.
<u>Hot Zone-2</u>	<u>Ground-disturbing activities will not occur from the first significant rain (1 inch) during the wet season, October 15–April 15, within 250 feet of the edge of vernal pools unless the field crews conduct the work from an established roadway. Rock outcrops will be accessed only on foot during all times of year. Ground-disturbing activities may occur during this period if a biologist implements measures to avoid the habitat and if the impacts and mitigation are consistent with the HCP. Measures could include directing crews on access, use of erosion/sediment fencing, use of access mats, and other techniques to avoid direct or indirect effects. PG&E may seek guidance from USFWS as to the suitability of additional measures to avoid or minimize take of this species. (Longhorn fairy shrimp.)</u>

³ Hot zones are areas containing a known localized population of covered species with a small and well-defined range, and where species would most likely be affected should covered activities occur there. Hot zone measures apply to areas specifically mapped as hot zones within modeled habitat as illustrated in PG&E’s Bay Area O&M HCP. These measures will be implemented consistent with PG&E’s Bay Area O&M HCP.

Field Protocols:

<u>Hot Zone-3</u>	<u>A biologist will survey for host and nectar plants (lupine, thistles, viola) prior to activity commencement and will flag off-road access for vehicles, or will identify if foot access or ATVs are necessary. In cases where plants cannot be avoided, activities will only be allowed during flight period, March 1–July 15, to reduce the risk of butterfly mortality. PG&E will avoid and minimize the introduction or spread of noxious weeds from vehicular traffic by educating employees, minimizing off-road travel, and inspecting vehicles to be sure they are not transporting observable noxious weeds. (For San Bruno elfin butterfly, Callippe silverspot butterfly, and Mission blue butterfly [San Bruno Mountain].)</u>
<u>Hot Zone-4</u>	<u>A biologist will survey for host and nectar plants (nakedstem buckwheat) prior to activity commencement and will flag off-road access for vehicles, or will identify if foot access or ATVs are necessary. In cases where plants cannot be avoided, activities will only be allowed during flight period, August 1–September 30, to reduce the risk of butterfly mortality. USFWS refuge biologist will be contacted if work is to occur on USFWS-owned refuge lands, and PG&E will adhere to USFWS guidance on methods to avoid and minimize effects. (Lange’s metalmark butterfly [Antioch Dunes National Wildlife Refuge].)</u>
<u>Hot Zone-5</u>	<u>A biologist will survey for host and nectar plants (dwarf plantain, purple owl’s clover, or paintbrush) prior to activity commencement and will flag off-road access for vehicles, or will identify if foot access or ATVs are necessary. In cases where plants cannot be avoided, activities will be allowed during flight period, March 1–April 30. PG&E will avoid and minimize the introduction or spread of noxious weeds from vehicular traffic by educating employees, minimizing off-road travel, and inspecting vehicles to be sure they are not transporting observable noxious weeds. (Bay checkerspot butterfly [Mapped serpentine grassland in Santa Clara County].)</u>
<u>Hot Zone-6</u>	<u>California tiger salamander: Limit activities to foot access only when working off of established roadways unless a biological monitor flags off-road access routes for equipment that minimizes impacts on habitat and species. This includes the identification and avoidance of vernal pools and stock ponds. Covered activities that cannot avoid vernal pool impacts will be completed when pools are clearly dry. {(For California tiger salamander [{both Central California and Sonoma County DPSs}] specific to Jepson Prairie, Stanford, and the Santa Rosa Plain)}</u>
<u>Hot Zone-7</u>	<u>Activities that result in ground disturbance will occur May 1–October 30 (active season). Vegetation will be cut using hand tools to 3 inches in height. Once the ground is visible, a visual survey for San Francisco garter snake will be conducted by the biologist prior to additional ground disturbance. Field crews will install solid exclusion fencing if the work is in areas of known species presence. If work needs to occur during the inactive period (November 1–April 30) and is located in an area of known occupancy, any burrows will be flagged and avoided by at least 10 feet wherever possible. If any burrows cannot be avoided by this distance, a biologist will inspect following activities to determine whether or not the burrow has been collapsed. If a burrow is collapsed, the biologist shall make efforts to open the burrow. (San Francisco garter snake.)</u>
<u>Hot Zone-8</u>	<u>For activities that will result in ground disturbance in tidal marsh or coastal wetland habitat, including the removal of marsh vegetation, a biologist will flag access routes for crews when working in habitats dominated by pickleweed (<i>Salicornia</i>) or smooth cordgrass (<i>Spartina alterniflora</i>) in order to minimize impacts on these species. Crews will hand-carry equipment and use protection mats (landing pads, pallets) to minimize ground disturbance when working within pickleweed or smooth cordgrass. Small areas of healthy vegetation will be cleared by hand prior to placement of protective mats. To avoid take of salt marsh harvest mouse, the biologist will assess the site to determine if: vegetation protection mats are appropriate, use of helicopters is needed,</u>

Field Protocols:

vegetation removal by hand is needed, and an onsite biological monitor is needed. Prior to placement of mats or removal of vegetation, the vegetation will be disturbed (i.e., flushed) to force movement of salt marsh harvest mouse into adjacent tidal marsh areas. Immediately following flushing, the field crew will place a mat or manually remove vegetation with nonmotorized tools (e.g., hoe, rake, trowel, or shovel) to the bare ground. Work will be conducted within 700 feet of wetlands suitable for the Ridgway's rail September 1–January 15. (Ridgway's rail, salt marsh harvest mouse [Marsh/Bay Fringe].)

Species-Specific AMMs for Certain Activities⁴:

Wetland-1	Vernal pools/species: Identify vernal pools and establish buffers. Maintain a buffer of 250 feet around vernal pools and vernal pool complexes. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the biologist or HCP administrator to minimize impacts. These measures include flagging access, requiring foot access, restricting work until the dry season, requiring a biological monitor during the activity, or excavating burrows in ROWs where trenching will occur. Activities must maintain the downstream hydrology to the vernal pool or complex. Additional minimization measures may be implemented with prior concurrence from USFWS.
Wetland-2	Wetland, ponds and riparian areas/species: Identify wetlands, ponds, and riparian areas and establish buffers. Maintain a buffer of 50 feet around wetlands, ponds, and riparian areas when feasible. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the biologist or HCP administrator to minimize impacts. These measures include flagging access, requiring foot access, restricting work until the dry season, requiring a biological monitor during the activity, or excavating burrows in ROWs where trenching will occur. Activities must maintain the downstream hydrology to the wetland, pond, or riparian area. Additional minimization measures may be implemented with prior concurrence from USFWS.
<u>SIKF-1</u>	<u>A biologist will inspect the work site no more than 30 days prior to construction to determine if potential San Joaquin kit fox dens are present. If potential dens are located within the proposed construction footprint and cannot be avoided during construction, a biologist will determine if the dens are occupied. All potential dens within the construction footprint will be dusted with appropriate tracking substrate or monitored with a motion-sensor camera for a minimum of 3 days to determine occupancy unless scat, discarded bones, and tracks are observed and then the den is presumed occupied. Exit ramps will also be installed in these areas at both ends of the excavated areas. If potential San Joaquin kit fox dens are present within the construction footprint or within 200 feet of the construction boundary, disturbance and destruction will be avoided where possible. If the potential dens are determined to be unoccupied and cannot be avoided, no further action is needed. If an occupied or natal/pupping den is discovered within the construction area or within 200 feet of the project boundary, USFWS shall be immediately notified to discuss protective measures; if USFWS staff are unable to be reached, PG&E will set up exclusion zones, visual screens, and construction monitors to ensure direct mortality is avoided. Under no circumstances will the den be disturbed or destroyed.</u>

⁴ These measures are specific to the activities with the greatest ground disturbance and as identified in PG&E's Bay Area HCP, and they include activities E9b (reconductoring), E14 (substation expansion), and G9-11 (pipeline lowering, coating replacement, and pipeline replacement).

Field Protocols:

PG&E Vegetation Management Best Management Practices (BMPs)

BMP 1	Environmental orientation (FP-01): PG&E employees and vegetation management contractors performing Vegetation Management activities shall receive ongoing environmental orientation. Orientation shall include review of environmental laws and guidelines that must be followed by all PG&E employees and contract vegetation management personnel to reduce or avoid impacts on covered species during vegetation management activities.
BMP 2	Notice to land managers (FP-05): Notify federal and state land managers of pending work, and schedule annual meetings with these land managers, as requested. Notify local agency land managers of pending work as requested, or as sensitive issues arise.
BMP 3	Fire safety equipment in SRAs (FP-09): During fire season in designated State Responsibility Areas, motorized equipment shall have federally approved or state-approved spark arrestors; all vehicles shall be equipped with firefighting tools as appropriate and in accordance with all applicable laws, rules, regulations, orders, and ordinances.
BMP 4	Fire safety Project Activity Level: Contractor shall be responsible for checking the daily Project Activity Level (a measure of fire weather conditions that, at certain levels, restricts activities otherwise permitted) during fire season when working on U.S. Forest Service (USFS) property.
BMP 5	Smoking prohibited: Smoking shall not be permitted during fire season, except in a barren area or in an area cleared to mineral soil at least 3 feet in diameter. Under no circumstances shall smoking be permitted during fire season while employees are operating light or heavy equipment, or walking or working in grass and woodlands.
BMP 6	Work site prohibited activities (FP-08): Hunting, firearms, portable stoves, open fires (such as barbecues) not required for the vegetation management activity, and pets (except for safety in remote locations) shall be prohibited in vegetation management work activity sites. All trash, food items, and human-generated debris shall be properly contained and/or removed from the site.
BMP 7	Vehicle speed (FP-07): To avoid hitting or crushing wildlife in the roadway and to avoid generating dust, vehicles will not exceed a speed limit of 15 miles per hour on low-use unpaved roads such as agricultural field roads, transmission right-of-way roads, and non-system numbered USFS roads with locked gates. Travel on high-use unpaved roads such as USFS logging roads shall be as slow as local traffic conditions allow.
BMP 8	Damage repair: All roads, fences, and structures damaged as a result of vegetation management operations shall be repaired and reported to the work group supervisor and the PG&E vegetation management representative. All gates shall be left open if found open or locked if found locked.
BMP 9	Parking and access (FP-02, 03): Vehicles and equipment shall be parked on pavement, existing roads, and previously disturbed areas to the extent practicable. In environmentally sensitive areas, vehicle access to work sites shall be restricted to existing roadways.

Field Protocols:

BMP 10	Fueling and Spills (FP-15): When practical, fuel vehicles and equipment off-site. If it is necessary to fuel on-site, the following precautions shall be taken: No vehicles or equipment shall be refueled within 250 feet of vernal pools, and 100 feet of a watercourse, ditch, wetland, or a pond, unless a bermed and lined refueling area is constructed. The fueling operator must stay with the fueling operation at all times. Do not top off tanks. Spill containment and cleanup materials must be available. Spills must be immediately cleaned up and contaminated materials disposed of properly. Fueling trucks and operators must have all necessary permits, licenses and training. Any spills must be reported immediately to supervisor and PG&E vegetation management representative.
BMP 11	Lop and scatter debris management: Debris that remains from lop and scatter operations shall be left at a height no greater than 18 inches.
BMP 12	Erosion control (FP-11): After vegetation management activities, if the amount of bare soil exposed in one location exceeds 0.1 acre, then erosion control measures shall be implemented. These measures may include straw mulching, seeding, and use of straw wattles. (No rice straw will be used around wetlands containing vernal pools.)
BMP 13	Vernal pool avoidance (FP-16, Wetland-1): Avoid operating vehicles and equipment within 250 feet (or the maximum distance practicable) of the edge of a vernal pool and, to the extent practicable, avoid walking through a vernal pool.
BMP 14	Elderberry longhorn beetle habitat: When routine vegetation management activities are conducted in an area of potential valley elderberry longhorn beetle habitat, a qualified individual will survey for the presence of elderberry plants within a minimum of 20 feet from the work site within the utility easement, ROW, franchise, or license, and shall note in vegetation management work request documents to avoid or minimize potential impacts on elderberry plants. <u>Qualified individuals are typically PG&E or contractor arborists or biologists who have undergone specific training to address their work needs through the identification of habitat (i.e., elderberry shrubs). In the range of valley elderberry longhorn beetle, elderberry shrubs with stems greater than 1 inch will be flagged for avoidance if work must occur within 20 feet of a shrub; when a shrub cannot be avoided (e.g., it must be pruned away from power lines or removed), the shrub will be treated and the impact will be reported to the USFWS in an annual report and mitigated per the terms and conditions of the federal Biological Opinion or subsequent authorization.</u> If elderberry plants have one or more stems 1 inch or more in diameter at ground level, additional measures identified in the Valley Elderberry Longhorn Beetle Conservation Plan shall be implemented. Otherwise, no additional minimization, avoidance, or protective measures are required.
BMP 15	Northern spotted owl (FP-18): When vegetation management staff is aware of known active northern spotted owl nests through either the CNDDDB viewer or property owner information, PG&E will implement the following. If the work is within 0.25 mile of a known active nest(s), the work will be performed either during a limited operating period of August 1 to January 31, or, if the work falls within the breeding period and is within 300 feet of the nest, the PG&E Avian Protection Program manager will be contacted for guidance and work will be performed as directed by the Avian Protection Program manager. If the work is scheduled during breeding season and if the work is 300 feet to 1/4-mile from the nest, work will be performed using hand tools (not chainsaws) or hydraulic pruners if the work is accessible from a regularly trafficked roadway. If the work cannot be performed with hand tools or hydraulic tools, then vegetation management staff will contact the Bird Program manager for guidance. In locations where known active nests occur, vegetation management staff will increase pruning distances from the conductors or pursue tree/brush removals in order to minimize the number of return visits to the area.

Field Protocols:	
BMP 16	Migratory Birds: All PG&E employees and contractors shall follow the Vegetation Management Migratory Bird Process <u>Nesting Bird Management Plan (NBMP)</u> , when applicable to vegetation management activities, to comply with Migratory Bird Treaty Act.
BMP 17	Sudden Oak Death: When performing work in counties subject to the Sudden Oak Death quarantine, <u>PG&E shall follow protocols based on the <i>California Oak Mortality Task Force Sudden Oak Death Guidelines for Arborists</i> (www.suddenoakdeath.org) and include measures for disposal of cut debris and sanitation of tools and equipment.</u> Vegetation Management Sudden Oak Death Protocols must be followed.
BMP 18	Environmental screening on non-EV activities: Vegetation management personnel shall verify that the environmental screening process was followed prior to conducting vegetation management activities associated with capital jobs and other non-vegetation management work. Vegetation management personnel shall follow any environmental protection measures identified for the job.
BMP 19	Cultural resources: If cultural resources are found (e.g., old bottles, cans, buildings), they shall be left in place and undisturbed. If it is necessary to move or disturb them to complete the work, or if human remains are found, stop work and contact the PG&E vegetation management representative.
BMP 20	Air Resources Board equipment permitting: All equipment shall be permitted by the Air Resources Board as required, including portable equipment or new stationary equipment with internal combustion engines greater than 50 Brake HP, (e.g., tow-behind generators, chippers, and truck- or trailer-mounted air compressors and pumps).
BMP 21	Vehicle idling: When working within 50 feet of residences or government or commercial buildings, engine idling, noise, and odor should be minimized to the extent practicable. Also adhere to the restrictions noted in the Commercial Vehicle Idling Tailboard when working on school grounds or within 100 feet of a school (K-12 and below, including play areas and sports fields, and day care facilities).
BMP 22	Contractor communication: Contractor shall have the ability to communicate quickly with their supervisor and/or PGE. This can be done by having a working cell phone or radio on the job site at all times or by identifying the closest area of cell phone reception or closest public telephone and familiarizing all employees with that location.
BMP 23	Accident response: If an environmental protection incident occurs, such as accidental introduction of substances into waterways or wetlands, accidental taking of an endangered species, or hazardous material spills, etc., call your supervisor and the PG&E vegetation management representative immediately.
BMP 24	Self-propelled mechanical equipment: Vegetation removal shall be completed without the use of self-propelled mechanical equipment (e.g., Hydro-ax, Brontosaurus, Slashbuster).
BMP 25	Work area vegetation (FP-10): The disturbance or removal of vegetation within the work area shall not exceed the minimum necessary to complete operations, subject to other public and health and safety directives governing the safe operations and maintenance of electric and gas facilities. Precautions shall be taken to avoid damage to non-target vegetation.

Field Protocols:

BMP 26	Vegetation debris disposal: Cleared or pruned vegetation, grass clippings and woody debris (including chips) shall be disposed of in a legal manner. All cleared vegetation and debris, grass clippings and woody debris (including chips) shall be removed from any wetland, ditch, pond, or stream and placed or secured where they cannot re-enter the watercourse.
BMP 27	Vegetation removal below conductors: Vegetation that at mature height does not pose a threat to the conductors shall not be removed, unless the removal is required to maintain compliance with California Public Resource Code Section 4292 (pole clearing).
BMP 28	Vehicle leak protection: Any vehicles driven and/or operated within or adjacent to streams shall be checked and maintained daily to prevent leaks of materials that, if introduced to the water, could be harmful to aquatic life.
BMP 29	Vehicle access (Plant-02): Vehicle access to streams and wetlands shall be limited to existing roads and crossings.
BMP 30	Work activities near streams, wetlands, or on saturated soils: When possible, activities near streams, wetlands, or on saturated soils shall be conducted during the dry season (generally May 15–October 15) or during periods of minimum flow. If it is not possible to perform the work in the dry season, perform rainy season work during dry spells between rain events.

VM Herbicide BMPs

BMP 31	Herbicides use (Plant-01): All herbicide applications performed by vegetation management contractors shall be made in compliance with label requirements as well as all appropriate federal, state, and local laws, rules, and regulations. Note: Use of herbicides and pesticides is not covered activities under the HCP.
BMP 32	Herbicides type: Only herbicides registered by the federal Environmental Protection Agency and California Environmental Protection Agency shall be applied.
BMP 33	County Agricultural Commissioner information: During the performance of Vegetation Management ROW Enhancement Operations, operator ID numbers and Site ID numbers shall be obtained for each facility as required by the County Agricultural Commissioner.
BMP 34	Pest Control Recommendations: Each application shall be covered by a written <i>Pest Control Recommendation</i> .
BMP 35	Pest Control Advisor oversight: A Licensed Pest Control Advisor shall oversee all herbicide and tree growth regulator applications. A qualified applicator shall supervise contractors making herbicide and tree growth regulator applications for vegetation management.
BMP 36	County Agricultural Commissioner inspection: County Agricultural Commissioners shall be invited to inspect the applicator and application operations when appropriate.
BMP 37	Herbicide use reporting: The Pest Control Business License holder (applicator) shall report herbicide use monthly to the County Agricultural Commissioner.
BMP 38	Annual worker safety training (clearing and herbicides): Contractor shall conduct annual worker safety training sessions for all contractor employees involved in the herbicide applications and manual/mechanical clearing. As requested, documentation of this training shall be on file with the PG&E representative who administers their contract.
BMP 39	Selective application of herbicides (Plant-01): Selective application techniques should be used for Vegetation Management ROW Enhancement Operations wherever practical so that desirable vegetation is not adversely affected.
BMP 40	Herbicide buffer widths: Buffer widths shall apply pursuant to <i>Vegetation Management Herbicide Buffer Widths to Protect Non-Target Organisms</i> as identified on product packaging.

Field Protocols:	
BMP 41	Use in watercourse protection zones: Mixing and loading of herbicides is prohibited in watercourse protection zones (see BMPs 60 and 61 for watercourse protection zones).
BMP 42	Spill protection and cleanup: Applicator shall have a spill prevention and cleanup kit in their vehicle and at the job site.
BMP 43	Backpack or light-capacity power equipment: Backpack equipment or light-capacity power equipment shall be used for all directed foliar applications.
BMP 44	Disposal of empty herbicide containers: Empty herbicide containers shall be taken off site, triple rinsed, and disposed of in a proper manner.
BMP 45	Minimum operating pressures: Minimum operating pressures shall be used. Nozzle tips that produce a coarser droplet should be used to minimize drift.
BMP 46	Transport of pesticides: Pesticides shall not be transported in the same compartment with persons, food, or feed. Pesticide containers shall be secured to the vehicle during transportation in a manner that shall prevent spillage into or off the vehicle.
BMP 47	Contractor written training program: The contractor shall have a written training program for employees who handle pesticides. The written program must describe the materials and the information that shall be provided and used to train the employees.
BMP 48	Contractor employee training: Training must be completed before an employee is allowed to handle any pesticide and continually updated to cover any new pesticides that shall be handled. Training must be repeated at least annually thereafter.
BMP 49	Inclement weather precautions: These special precautions shall be observed during periods of inclement weather: • Applications shall not be made in, immediately prior to, or immediately following rain when runoff could be expected. • Applications shall not be made when wind and/or fog conditions have the potential to cause drift. • Basal bark applications shall not be made when stems are wet with rain, snow, or ice.
Other VM BMPs	
BMP 50	CNDDDB search: Prior to any ROW clearing project or any enhancement project, the CNDDDB shall be checked for any records of threatened, endangered, or sensitive species.
BMP 51	Flagging and avoiding CNDDDB resources: Any locations identified through the CNDDDB search shall be flagged and appropriate avoidance measures shall be put in place. Tailboards shall be held before work begins.
BMP 52	Flagging and avoiding sensitive habitats (Wetland-01, 02): Sensitive habitats such as meadows, riparian areas, wetlands, vernal pools, and serpentine outcrops shall be flagged and appropriate avoidance measures shall be put in place. Tailboards shall be held before work begins.
BMP 53	Existing roads: All existing roads shall be kept open and erosion control measures re-installed after the project is completed or during inclement weather.
BMP 54	Clearing under towers, poles and guy wires: Contractor shall clear all vegetation 10 feet around and under all towers/poles and guy wires. Only manual clearing work can occur within the above-mentioned 10 feet. No mechanical equipment shall be used within 10 feet of the above-mentioned structures. All vegetation cut under and within 10 feet of the towers shall be removed from the area and mulched to a depth not greater than 18 inches.
BMP 55	Mowing debris mulching: All debris that remains from mowing operations shall be mulched to a depth not greater than 18 inches.
BMP 56	Tree removal: Trees greater than 12 inches in diameter at breast height shall be hand-felled and then the top and limbs removed and the bole decked on the side of the ROW.
BMP 57	Flagging guy wires: Contractor shall flag all guy wires 200 feet in advance of working an area, using bright colored flagging (a minimum of three flags per wire).

Field Protocols:	
BMP 58	Contractor water source: Contractor shall have a water source containing a minimum of 300 gallons of water and 250 feet of 1-inch hose on site at all times during operation. The water source must either be self-propelled self-propelled or always attached to a vehicle capable of moving it to where it is needed. Where access/terrain allows, contractor's water source must always be within 500 feet of the mowing/cutting operation. Excess water shall be disposed of in accordance with all laws and regulations.
BMP 59	Fire extinguishers in mowers: Each mower shall have a minimum of a 10-pound, Class A, B, C fire extinguisher mounted in the cab.
BMP 60	Fire safety measures: Contractor must stay on site for one-half hour after mowing operations end for the day to ensure fire safety. When extreme fire levels are reached, the following extra precautions must be implemented immediately. • An additional support person shall be dedicated to follow the mower with an Indian Back Pump and McLeod. • Mowing hours will be reduced to the hours of 5:00 a.m. through 12:30 p.m. • The use of a humidity meter shall occur. A reading of less than (<) 20% humidity shall stop the mowing operation for the day. Readings shall be taken every 3 hours during operation.
BMP 61	Watercourse protection: Watercourse protection zones shall be marked by the PG&E representative in charge with brightly colored flagging prior to the start of any mowing/timber operation. Water classes are defined by the California Forest Practice Rules (14 California Code of Regulations Section 916.5). The following watercourse protection zone clearances must be maintained at all times. • Class 1 and 2 watercourses with a slope < 30%: No heavy equipment within 50 feet. • Class 1 and 2 watercourses with a slope > 30%: No heavy equipment within 75 feet. • Class 3 watercourse: No heavy equipment within 25 feet. • Unclassified watercourses with a defined channel: No heavy equipment within 25 feet. No mowing shall be allowed within the above distances. Trees within the above distances shall be removed manually. Brush and other small vegetation shall be left for a shade canopy on the watercourse. The actual width of the watercourse protection zone may vary based on a PG&E representative's judgment in the field. All impaired watercourses and their protection zone clearances shall be identified before the project begins.
BMP 62	Water quality, soil resources and riparian vegetation protection: The following protection measures are designed to prevent adverse impacts on water quality, help protect soil resources, and minimize the loss of riparian vegetation. 1. Plants in watercourse protection zones that do not pose an imminent or clearly foreseeable future threat to conductors shall not be removed. 2. To help prevent erosion and soil displacement, exclusion zones may be increased in areas with steep slopes or highly erodible soils. 3. Leave at least 50% soil cover (i.e., mulch or vegetative ground cover) for erosion control in watercourse protection zones.
Note: The HCP identified in parentheses where PG&E field protocols or AMMs are similar or overlap. This list shows the same identification under the BMP number.	

Table 2-4. Applicant Proposed Measures and Mitigation Measure

Mitigation Measure	Applicant Proposed Measure
Aesthetics	
APM AES-1: Restore disturbed areas	Previously vegetated areas greater than 0.10 acre that are disturbed by the project will be recontoured to their approximate original conditions and reseeded with an appropriate native seed mix to minimize scarring.
APM AES-2: Protect scenic vistas and scenic highways	For minor new construction facilities larger than 1.0 acre that would have a substantial adverse effect on a scenic vista or views, a designated scenic highway or a scenic public viewpoint, the facility will be relocated to an area not visible from the scenic vista, designated state scenic highway, or scenic public viewpoint. If a reasonably feasible alternate location is not available, implement APM AES-5 or 6, as appropriate to the facility, to reduce substantial adverse effects to less-than-significant levels by design or screening measures. PG&E will consult with local jurisdictions and parks agencies as appropriate to discuss reasonably-feasible options regarding location and visual screening.
APM AES-3: Shield temporary construction lighting	<u>Construction activities will cease 30 minutes before sunset and will not begin prior to 30 minutes after sunrise, where feasible. Night work will be limited in extent, duration, and brightness, to the extent feasible.</u> If temporary construction lighting is required, PG&E will use shielded construction light fixtures, or otherwise screen or direct lighting away from nearby residences except in the cases of emergency.
APM AES-4: Apply minimum lighting standards	All artificial outdoor lighting will be limited to lighting for safety and security, and designed using Illuminating Engineering Society's design guidelines, International Dark-Sky Association-approved fixtures, or other industry standards that address lighting impacts. Lighting above ground level will generally be directed downward or inward, where consistent with safety concerns, and shielding will be utilized, where needed, to minimize light scatter off-site <u>off site</u> . Light fixtures will have non-glare finishes that will not cause reflective daytime glare. Lighting will be designed for energy efficiency, where feasible.
APM AES-5: Reduce visibility of new structures in sensitive landscapes	Within sensitive landscapes, PG&E will design structures associated with minor new construction to minimize the impact on the existing visual character and quality associated with the introduction of new structures in sensitive landscapes, such as in, along, or near national, state, or local parks, recreation areas, forests, scenic routes, vista views, or similar. To the extent feasible and consistent with safety, visible pipelines, guardrails, and substation and switching station infrastructure within such areas will be of a non-reflective material that helps surfaces to blend better with the surroundings. In scenic or visually sensitive areas, PG&E will implement aesthetic design features in new concrete or shotcrete buildings that are visible to the public. These features may include mimicking natural material (e.g., stone or rock surfacing) or integral color, in the same theme as the surrounding area, to reduce visibility and to better blend with the landscape.
APM AES-6: Implement landscape buffers or other screening for minor new construction	Landscaping treatments may be utilized to help to maintain the local character, improve aesthetics, create a visual buffer between sensitive viewers and minor new construction facilities, and diminish the visual scale of proposed features to reduce substantial adverse aesthetic impacts to a less than significant level. Other measures, such as installing prefabricated walls or fencing, may also be utilized to reduce the visual impacts of minor new construction that is visible to the public. Drought-resistant native trees, shrubs, and/or an herbaceous understory shall be used in such landscaping to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and

Mitigation Measure	Applicant Proposed Measure
	wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained. PG&E shall adhere to the following practices in implementing landscape or other screening buffers for minor new construction where necessary to reduce substantial adverse aesthetic impacts: • Design and implement low impact development (LID) measures that disperse and reduce runoff by using such features as vegetated buffer strips between paved areas that catch and infiltrate runoff, bioswales, cisterns, and detention basins. In addition, pervious paving shall be evaluated for use in the proposed project to improve infiltration and to reduce the amount of surface runoff from entering waterways and the stormwater system. However, LID measures shall not be used where infiltration could result in adverse environmental effects. • Drought-resistant vegetative accents and screening shall be considered to aid in a perceived reduction in the scale and mass of large built features in visually sensitive areas, while accentuating the design treatments that shall be applied to built features. Plant selection shall be based on the ability to screen built features and provide aesthetic accents. • The construction contractors shall use native grass and wildflower seed in erosion control measures where such a measure will improve aesthetics. Species shall be chosen that are native and indigenous to the area and for their appropriateness to the surrounding habitat. If not appropriate to the surrounding habitat, wildflowers should not be included in the seed mix. • Under no circumstances shall any invasive plant species be used at any location. • Maximize the use of planting zones that do not need irrigation, such as seeding with a native grassland and wildflower meadow mix, which reduce or eliminate the need for a permanent irrigation system. • A prefabricated wall or fencing may be installed as appropriate to provide partial screening of the natural gas or expanded electric substation facilities. The design of the wall or fence will be comparable to or complement the existing substation screening or nearby land uses. • No screening measures shall degrade or eliminate scenic vistas or be designed in a manner that negatively affects views from scenic roadways. In addition, these measures shall not be implemented where implementation would constitute an adverse effect upon sensitive habitats or sensitive species.
Agriculture and Forestry Resources	
APM AG-1: Coordination with farmers, and ranchers regarding construction activities	Coordination shall include the following: • Advance Notice: Prior to construction, PG&E shall give at least 30 days advance notice of the start of construction-related activities to farmers and ranchers. Notification shall be provided by mailing notices to all properties within 300 feet of the project route. The announcement shall (1) describe where and when construction is planned, and (2) provide a point of contact for complaints related to construction activities. • PG&E shall work with farmers and ranchers to schedule project work, to the extent feasible, around their harvest and planting periods in order to minimize disruptions to agricultural operations. If PG&E does not have specific access rights, access across active fields shall be negotiated with the farmer and/or landowner in advance of any construction activities. In areas containing permanent crops (i.e., grape vines, orchard crops, etc.) that must be removed to gain access to pole sites for construction purposes, the PG&E shall provide fair market compensation to the farmer and/or landowner.

Mitigation Measure	Applicant Proposed Measure
Air Quality	
APM AG AIR-1: Implement Dust Control Best Management Practices	PG&E will implement control measures to reduce construction-related fugitive dust. The following measures are based on BAAQMD's CEQA guidelines and are in conformance with fugitive dust control recommendations from the NSCAPCD and YSAQMD. • All exposed surfaces will be watered at a frequency adequate to maintain minimum soil moisture of 12%. Moisture content can be verified by lab samples or moisture probe. • All haul trucks transporting soil, sand, or other loose material off-site 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 miles per hour (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. • All excavation, grading, and/or demolition activities will be suspended when average wind speeds exceed 20 mph. • 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. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time will be limited. Activities will be phased to reduce the amount of disturbed surfaces at any one time. • All trucks and equipment, including their tires, will be washed off prior to leaving the site. • 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%.
Biological Resources	
APM BIO-1: Prevent or minimize spread of invasive weeds	The following would <u>will</u> be implemented <u>on E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction</u> to prevent the spread of invasive weeds during all phases of covered activities, as appropriate: • During covered activities involving ground disturbance, mud and/or accumulated soils would <u>will</u> be removed from equipment and vehicles, to the extent feasible. Vehicles and equipment would <u>will</u> be cleaned or washed before entering a new work site. <u>A log will be kept for each job site and would be completed to document each cleaning or washing of vehicles or equipment before entering each new work site.</u> • Vehicles would <u>will</u> be <u>staged and stored in</u> on paved or cleared areas whenever possible <u>feasible</u>. • Certified weed-free mulch, straw, hay bales, or equivalent materials would <u>will</u> be used where necessary for covered activities.

Mitigation Measure	Applicant Proposed Measure
APM BIO-2: Protect covered wildlife encountered while performing covered activities <u>Protect special-status wildlife encountered while performing covered activities and report covered wildlife observations</u>	<u>Any special-status wildlife species encountered during the course of a covered activity will be allowed to leave the area unharmed, and work activities that could disturb or harm the individual will halt until the wildlife has left the area. Encounters with a special-status species will be reported to a qualified biologist and PG&E environmental staff.</u> <u>PG&E will maintain records of all covered wildlife species encountered during permitted activities. Encounters with covered wildlife species will be documented and provided to CDFW in an annual report as required by the ITP. If a covered wildlife species is encountered during the course of operations, the following information will be reported for each species:</u> <u>The locations (i.e., narrative, vegetation type, and maps) and dates of observations, including occurrences observed during any required surveys.</u> <u>The general condition of individual health (e.g., apparent injuries).</u> <u>If the species is moved, the location where the species was captured and the location where it was released.</u> <u>The locations, dates, and species and behaviors observed during covered wildlife monitoring.</u> Any covered wildlife species encountered during the course of a covered activity would be allowed to leave the area unharmed or, if conditions warrant, moved out of immediate danger. Encounters with a special-status species would be reported to a project biologist and/or PG&E Environmental staff. Project biologists/PG&E Environmental staff members would maintain records of all covered wildlife species encountered during permitted activities. Encounters with covered wildlife species would be documented and provided to CDFW in an annual report. If a project biologist encounters a covered wildlife species, the following information would be reported for each species: The locations (i.e., narrative, vegetation type, and maps) and dates of observations. The general condition of individual health (e.g., apparent injuries). If the species is moved, the location where the species was captured and the location where it was released. <u>When conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction PG&E will document encounters with special status species to the same level of detail as required for covered species. During PG&E's environmental screening process, PG&E will also apply this measure to other covered activities to protect special status species and habitats based on recommendations from qualified biologists. This data will be provided in ITP annual reports.</u>
APM BIO-3: Design and site minor new construction projects <u>activities</u> to avoid sensitive areas	New, permanent facilities as part of minor new construction activities would <u>will</u> be sited and designed to avoid impacts on sensitive vegetation types, sensitive natural communities, and unique plant assemblages, as well as occupied habitat and suitable habitat for special-status species, to the extent feasible. If impacts on these areas cannot be avoided, PG&E will determine if additional permitting is required to conduct the work and obtain the required permits (e.g., LSAA). If impacts are expected on covered species' habitat, Mitigation Measure BIO-1 (MM BIO-1) will be implemented to mitigate for habitat impacts. <u>Where minor new construction would result in impacts on sensitive vegetation types, sensitive natural communities, or unique plant assemblages, PG&E will minimize the construction footprint and implement appropriate protective measures as recommended by the qualified biologist to protect the natural community. Examples of such measures include: reseeding with a California</u>

<u>Mitigation Measure</u>	<u>Applicant Proposed Measure</u>
	<u>annual seed mix, installing protective fencing around sensitive natural communities or resources, and installing wattles, erosion blankets and other drainage controls to protect new or adjacent plantings.</u>
<u>APM BIO-3a: Minimize spread of invasive plant and plant pathogens in minor new construction</u>	<u>When conducting minor new construction activities, PG&E will avoid or minimize the spread of invasive species by taking the following actions:</u> <u>1. Prior to commencement of activities located on or adjacent to non-paved surfaces, a qualified biologist will flag known populations of noxious weeds and invasive plants in the work areas. Invasive plant species include those listed as invasive by the California Invasive Plant Council (Cal IPC).</u> <u>2. PG&E will stage work in areas not infested with weeds or treat for weed removal prior to using an infested area.</u> <u>3. Prior to ground disturbance in areas containing species susceptible to Sudden Oak Death, a qualified professional (e.g., biologist, arborist, botanist familiar with Sudden Oak Death and the vegetation communities in the area) will assess the risk of activities and will identify and implement measures to reduce or avoid the risk of Sudden Oak Death spread. These measures will include but will not be limited to the following, and will be further developed and updated based on the best available science and site-specific conditions:</u> <u>a. Designate quarantine areas and implement proper measures for disposal of infested materials (e.g., branches, split wood, wood chips).</u> <u>b. Sanitize shoes, pruning gear, and other equipment with sanitizing materials (e.g., chlorine bleach, Clorox Clean-up, Lysol, scrub brush, boot brush) before and after ground-disturbing and vegetation removal activities are implemented.</u> <u>4. Clothing, footwear, and equipment used during minor new construction will be cleaned of soil, seeds, vegetation, or other debris or seed-bearing material before entering a work site or when leaving an area with infestations of invasive plants and noxious weeds.</u> <u>5. Heavy equipment and other machinery used in areas with infestations of invasive plant species or Sudden Oak Death will be inspected for the presence of invasive species before use on the project site and will be cleaned before entering the site, to reduce the risk of introducing invasive plant species or plant pathogens.</u> <u>6. To minimize the introduction and spread of noxious weeds and invasive plants, PG&E will avoid moving weed-infested gravel, rock, and other fill materials to relatively weed-free locations. In areas where invasive plants are removed during minor new construction or vegetation removal activities, PG&E will dispose of invasive plant biomass off site at an appropriate waste collection facility or treat biomass on site to eliminate seeds and propagules and prevent reestablishment; if moved off site, PG&E will transport invasive plant material in a closed container or bag to prevent the spread of propagules during transport. PG&E will use certified weed-free straw and mulch for erosion-control projects. PG&E will maintain stockpiled, uninfested material in a weed-free condition.</u> <u>7. Areas where ground disturbance has resulted in exposed soil as a result of minor new construction shall be seeded with compatible California annual species, as determined by a qualified biologist or botanist familiar with the native vegetation in the area and experienced in revegetation techniques. Revegetation will occur prior to the onset of winter rains within the year initial impacts take place. If work cannot feasibly be scheduled outside the</u>

<u>Mitigation Measure</u>	<u>Applicant Proposed Measure</u>
	<u>rainy season, revegetation may occur as directed by the qualified biologist and no later than the onset of the next winter rains.</u> 8. <u>To ensure a successful revegetation effort, onsite vegetation shall meet the following success criteria:</u> a. <u>PG&E shall perform pre-activity surveys to record baseline vegetative ground cover conditions and composition by a qualified biologist prior to covered activities as follows. The biologist will record the following:</u> i. <u>Absolute percent ground cover for the entire work area.</u> ii. <u>Relative percentages of ground cover within the work area by herbaceous plants, shrubs, trees, and noxious/invasive plants.</u> iii. <u>Develop a catalog of all invasive species present within the work area, including an estimate of percent composition by species.</u> b. <u>PG&E will conduct post-activity monitoring of work areas in the spring following completion of minor new construction.</u> i. <u>A qualified biologist will record any new invasive species that may have inadvertently been introduced to the work area. The biologist shall make special note of any new invasive plant species rated as "high" by the Cal IPC.</u> ii. <u>A qualified biologist will record whether there was an increase in relative cover of invasive species from baseline that may have resulted from the covered activity.</u> iii. <u>If relative cover of invasive plant species has increased within the work area, PG&E shall remove and/or dispose of invasive plants in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor.⁵ If any new invasive plants rated by Cal IPC as "high" are found within the work area, they will be removed in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor.</u> iv. <u>If the relative ground cover of invasive plants exceeds baseline by 100 percent or more, PG&E will reseed the areas where invasive plants are removed and monitor for one additional year.</u>
APM BIO-4: Avoid special-status plants	<u>Occurrences of special-status plant species will be avoided to the extent practicable and will include performance of project activities in special-status plant habitat after senescence. PG&E has created "Map Book zones" for the 13 state or federally listed plants that are covered in the O&M HCP. A <i>Map Book zone</i> is defined as an area of occupied or potentially occupied the HCP-covered plant species habitat as determined by PG&E botanical surveys. When rare and endangered plant species subject to the NPPA cannot be avoided, PG&E will follow the requirements of California Fish and Game Code Sections 1913(b) and 1913(c) concerning notification to CDFW at least 10 days in advance and provide an opportunity to salvage such species.</u> <u>If a special-status plant is found or known to occur, the plant will be avoided if feasible (i.e., O&M objectives could still be met). If feasible to avoid, avoidance will include establishing a buffer around the plants and demarcation of the buffer by a qualified biologist or botanist using flagging. Consideration of site-specific environmental factors such as terrain, site hydrology, light, and potential introduction of invasive plants may inform the avoidance approach.</u>

⁵ A Pest Control Advisor in this instance means an individual in good standing with an active license issued by the California Department of Pesticide Regulation.

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APM BIO-5: Erect wildlife <u>flagging or</u> exclusion fencing	Prior to construction or commencement of any activity that, in the absence of fencing, is likely to <u>directly or indirectly</u> adversely affect covered special-status species, exclusion fencing for the species would <u>will</u> be installed around the perimeter of the activity footprint,⁶ or otherwise to ensure species protection. Any exemption or modification of exclusion fencing requirements would <u>will</u> be based on the specifics of the activity and the site-specific population or habitat parameters. Sites with low population density and disturbed, fragmented, or poor habitat would <u>will</u> likely be candidates for fencing requirement exemptions or modifications. Substitute measures, such as onsite biological monitors in the place of the fencing requirement, would <u>will</u> be performed as appropriate. Prior to fencing, the project biologist would <u>will</u> ensure (to the extent possible <u>feasible</u>) that covered special-status species are absent from the activity footprint. After an area is fenced, PG&E is responsible for ensuring that covered special-status species fencing is maintained and opened/closed appropriately during project activities and regularly inspected for damage, which would <u>will</u> be repaired as soon as possible. <u>This measure will also be applied when conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction when these activities are likely to adversely affect special-status species. PG&E may also apply this measure to other covered activities to protect special status species and habitats based on recommendations from qualified biologists.</u>
APM BIO-6: Protect nesting birds	All vegetation clearing and ground-disturbing activities would be conducted outside of the nesting season (generally March 1 to August 31) to the extent feasible. If this is not feasible, a biologist or qualified⁷ individual would determine if pre-construction surveys, nest buffers, and/or monitoring are needed. Nesting bird surveys would be conducted by a qualified biologist and would be scheduled to occur within a timeframe prior to construction that is suitable for the detection of recently established nests. If active nests containing eggs or young are found, the qualified biologist would establish an appropriate nest buffer in accordance with PG&E's Nesting Bird Management Plan. Nest buffers would be species-specific and can range from 15 to 100 feet for passerines and 50 to 300 feet for raptors, depending on the planned activity's level of disturbance, site conditions, and the observed bird behavior. Established buffers would remain until the young have fledged or the nest is no longer active. Active nests would be periodically monitored until the young have fledged or all construction is finished. <u>All vegetation clearing and ground-disturbing activities will be conducted outside of the nesting season (generally March 1–August 31) to the extent feasible. If this is not feasible, a biologist or qualified⁷ individual will determine if pre-construction activity surveys, nest buffers, and/or monitoring are needed in accordance with PG&E's Nesting Bird Management Plan. Nesting bird surveys will be scheduled to occur within a timeframe prior to construction the activity that is suitable for the detection of recently established nests. If active</u>

⁶ An activity footprint is the area of ground disturbance associated with the pre-construction, construction, operation, implementation, maintenance, and decommissioning of an activity, including associated linear and non-linear components (e.g., staging areas, access routes and roads, gen-ties, pipelines, other utility lines, borrow pits, disposal areas). The footprint may also be considered synonymous with the covered activity site.

⁷ A qualified individual would have experience conducting nesting bird surveys and would be able to accurately identify nesting behavior.

<u>Mitigation Measure</u>	<u>Applicant Proposed Measure</u>
	<u>nests containing eggs or young are found, the qualified biologist or individual will establish an appropriate nest buffer in accordance with the species-specific buffers in PG&E's Nesting Bird Management Plan. Nest buffers under the Plan will be species-specific and can range from 15 to 100 feet for passerines, 50 to 300 feet for raptors, or larger if necessary, depending on the planned activity's level of disturbance, site conditions, and the observed bird behavior. Covered activities will not commence within the established buffer areas until the qualified biologist or individual determines that the young have fledged or the nest is no longer active. Active nests will be periodically monitored until the young have fledged or the activity all construction is finished. If birds with active nests are observed showing behavioral signs of agitation (e.g., standing up from a brooding position, flying off the nest) during covered activities, the buffer will be increased to a distance in which the behavioral signs of agitation cease, in accordance with PG&E's Nesting Bird Management Plan.</u> <u>As part of the ITP annual report, PG&E will provide a summary of covered activities where the Nesting Bird Management Plan was implemented; the summary will include the location, dates, species (if known), and nest buffers applied to the covered activity including buffer efficacy.</u> <u>(The Nesting Bird Management Plan is intended to maintain compliance with federal and state bird protection regulations through a standardized approach to avoiding and minimizing disturbance to nesting birds, including burrowing owl [see APM BIO-6a].)</u>
<u>APM BIO-6a: Western burrowing owl avoidance</u>	<u>If burrowing owls are observed during any covered activities, a qualified biologist will be contacted immediately. The qualified biologist will determine measures to avoid impacts burrowing owls. For ground disturbing activities greater than 0.1 acre in suitable burrowing owl habitat, a qualified biologist will conduct a survey at least 14 days prior and again 24 hours prior to the activity to determine the presence/absence of active burrowing owl nesting or wintering burrows within 250 feet of a work area. If owls or sign are detected and work needs to occur within 250 feet, PG&E will implement measures to avoid nest abandonment such as rescheduling the work, screening work areas, minimizing pedestrian access within 250 feet, and evaluating owl's tolerance to disturbance, and report results to CDFW annually.</u>
<u>APM BIO-7: Protect breeding and pupping bats</u>	<u>When feasible, activities directly affecting bat roosting habitat will be conducted outside of the bat breeding/pupping season (generally, April through mid-September). If work that would affect known bat breeding sites must be done in the bat breeding/pupping season, a qualified biologist would evaluate known breeding/roosting sites or conduct surveys for bat roosts in suitable breeding/roosting sites (e.g., bridges, mines, caves, trees with hollows, palm trees, snags, buildings, long and dark culverts, rock outcrops, dense tree canopies, and flaking tree bark). If evidence of a bat maternity roost is found or maternity roosts are detected, PG&E will avoid conducting covered activities that may directly affect the active roost site, including the following:</u> <u>If a maternity roost is identified then the qualified bat biologist will develop a Bat Avoidance and Monitoring Plan prior to the start of project activities that shall include: (1) an assessment of all impacts to bats from the activity, including noise disturbance during covered activities and (2) effective avoidance and minimization measures to protect bats in order to ensure that direct impact to active bat maternity roost site do not occur. Notification will be provided to CDFW prior to the start of covered activities. The notification will include a copy of the Bat Avoidance and</u>

Mitigation Measure	Applicant Proposed Measure
	<u>Monitoring Plan. If direct impacts to identified maternity roost sites cannot be avoided, PG&E will provide a compensatory mitigation plan to CDFW for review and approval.</u> • <u>As necessary, an exclusionary buffer will be maintained around active roosts. The size of the buffer will be determined by the qualified biologist based on factors such as the planned activity's level of disturbance and site conditions and will typically be 250 feet.</u> • <u>As necessary, a qualified biologist will monitor active roost site buffers during O&M activities to determine if roosting activity is influenced by noise or vibrations until a qualified biologist has determined if the young bats are volant (i.e., able to fly) or the roost is unoccupied.</u> <u>When feasible, to protect bats and in accordance with BMP-30, tree work near riparian zones shall be conducted during the dry season (generally May 15–October 15). If it is not feasible to conduct tree work during the dry season, operations will occur between rain events or during dry spells unless there is an emergency or imminent threat to life or property.</u> <u>When feasible, activities directly affecting bat roosting habitat would be conducted outside of the bat breeding/pupping season (generally, April through mid-September). If work that would affect known bat breeding sites must be done in the bat breeding/pupping season, PG&E would evaluate known or suspected breeding/roosting sites (e.g., bridges, mines, caves, trees with hollows, palm trees, snags, buildings, long and dark culverts, rock outcrops, dense tree canopies, and flaking tree bark). If roosting bats are detected, PG&E would avoid conducting construction activities that may directly affect the active roost site, including the following:</u> • <u>As necessary, an exclusionary buffer would be maintained around active roosts. The size of the buffer may be modified at the discretion of the qualified biologist based on the species' sensitivity to disturbance from O&M activities and the status of the roost.</u> • <u>As necessary, a qualified biologist would monitor active roost site buffers during O&M activities to determine if roosting activity is influenced by noise or vibrations until a qualified biologist has determined if the young bats are volant (i.e., able to fly).</u>
APM BIO-8: Avoid Alameda whipsnake in core habitat	<u>Prior to the start of construction in core habitat, the work area will be surveyed for Alameda whipsnakes by a biologist. If a whipsnake is encountered during construction, activities that present a risk to the snake will stop until the snake has moved out of the construction area. Prior to the start of construction in core habitat (i.e., areas of concentrated use; habitat in core areas primarily consists of scrub communities such as coastal scrub, coyote brush scrub, mixed chaparral, and chamise chaparral but may also include immediately adjacent grassland), the work area will be visually surveyed for Alameda whipsnakes by a qualified biologist. If a whipsnake is encountered during construction, activities will stop and the qualified biologist will then identify actions sufficient to avoid impacts on the species (e.g., continued work halt, buffer establishment) and the whipsnake will be allowed to leave the area on its own volition. Activities could resume when the qualified biologist determines that activities will not adversely affect the whipsnake or that the whipsnake has moved a sufficient distance from the work area such that activities will not adversely affect the whipsnake.</u>
<u>APM BIO-9: San Joaquin kit fox/American badger</u>	<u>When ground disturbance exceeding 0.5 acre is planned within suitable habitat and range of San Joaquin kit fox or American badger, a qualified biologist familiar with these species and experienced in conducting surveys will survey</u>

Mitigation Measure	Applicant Proposed Measure
	<u>the work area no more than 30 days prior to the covered activity to determine if potential San Joaquin kit fox or American badger dens are present. If potential dens are located within the proposed activity footprint and cannot be avoided during the activity, a biologist will determine if potential dens are occupied. All potential dens within the activity footprint will be dusted with appropriate tracking substrate or monitored with a motion-sensor camera for a minimum of 3 days to determine occupancy, unless scat, discarded bones, and tracks are observed and the den is presumed occupied. If potential dens are determined to be unoccupied and cannot be avoided, no further action is needed. Otherwise, potential dens within the project footprint or within 200 feet will be avoided where possible, or the following steps will be taken. If an occupied or natal/pupping den is discovered within the activity area or within 200 feet of the project boundary, PG&E shall contact CDFW to discuss protective measures and the need for a permit. Under no circumstances will an occupied or natal/pupping den be destroyed. In the suitable habitat and range of San Joaquin kit fox and American badger, exit ramps will be installed at each end of excavated trenches.</u>
MM BIO-1: Acquire, preserve, and/or enhance suitable habitat for mitigation	PG&E will acquire, preserve, and/or enhance potential habitat, or purchase bank credits for California freshwater shrimp, California tiger salamander, and Alameda whipsnake to fully mitigate for the potential take of these species. Habitat mitigation will be provided for covered species based on acreages of estimated and actual habitat losses in consistent with <i>jump start</i>⁸ and <i>stay ahead</i>⁹ mitigation approaches. Mitigation for habitat disturbance from temporary and permanent impacts would be provided at the following ratios: • 3:1 ratio for permanent impacts on modeled habitat for California freshwater shrimp, California tiger salamander (both Central California and Sonoma County DPS), and Alameda whipsnake (3 acres mitigated for every 1 acre permanently affected). • 1:1 ratio for temporary impacts on modeled habitat for California freshwater shrimp and California tiger salamander (Sonoma County DPS). • 1:1 ratio for temporary impacts on modeled breeding habitat for California tiger salamander (both Central California and Sonoma County DPS). • 0.5:1 ratio for temporary impacts on modeled upland habitat for California tiger salamander (Central California DPS) (0.5 acres mitigated for every 1 acre temporarily affected) when mitigation is provided according to <i>jump start</i> and <i>stay ahead</i> provisions. For the first 5 years, mitigation that is not in place prior to any impacts will be at a 1:1 ratio. • 0.5:1 ratio for temporary impacts on non-core (movement or dispersal) habitat for Alameda whipsnake (0.5 acres mitigated for every 1 acre temporarily affected) when mitigation is provided according to <i>jump start</i> and <i>stay ahead</i> provisions. For the first 5 years, mitigation that is not in place prior to any impact will be at a 1:1 ratio. 1:1 ratio for temporary impacts on Alameda whipsnake core or perimeter core habitat. By March 31 of each year, PG&E would submit an annual report to CDFW summarizing the mitigation ratios and credits that were debited from its mitigation credit portfolio for covered activities during the previous calendar year, as well as detailed information from APM BIO-2.

⁸ Land acquisition, preservation, and/or habitat enhancement efforts that are made in advance of permit issuance.

⁹ PG&E will “stay ahead” of its mitigation obligations by calibrating the mitigation credits that may be necessary for future years based on information from the Annual Report for the prior year.

Mitigation Measure	Applicant Proposed Measure
Cultural Resources	
APM CR-1: Inventory, evaluate, and protect cultural resources	As part of the screening process described in Chapter 2, Project Description, PG&E will continue to review historical and archaeological resources that were previously recorded, as well as structures that meet the 50-year threshold throughout the 30-year duration of ITP. If any resources have the potential to be eligible for listing on the CRHR or NRHP, PG&E will determine whether project activities will affect the resources and, if the activities would cause a substantial adverse change in the resource, a qualified cultural specialist will coordinate with PG&E, the landowner, and California Department of Fish and Wildlife (CDFW) on the appropriate steps for evaluation, protection, documentation and/or preservation of the resource.
APM CR-2: Provide worker training	The following procedures will be implemented prior to commencement of any project-related construction activities: All PG&E, contractor, and subcontractor project personnel will receive training regarding: • Appropriate work practices necessary to effectively implement the APMs and to comply with the applicable environmental laws and regulations. • The potential for exposing subsurface cultural resources and paleontological resources. • How to recognize possible buried cultural and paleontological resources. • Site-specific physical conditions to improve hazard prevention and, if applicable, a review of the stormwater pollution prevention plan, which will also address spill response. • <u>Contact information for the project (i.e., environmental planner who will reach out to the appropriate resource specialist, such as archaeologists, paleontologists, cultural resources monitors, or tribal monitors, as needed.</u> This training will include a presentation of: • Procedures to be followed upon discovery or suspected discovery of historic or archaeological materials, including Native American remains and their treatment. • Procedures to be followed upon discovery or suspected discovery of paleontological resources. • Procedures to be followed for spill and other hazard prevention. • Actions that may be taken in the case of violation of applicable laws.
APM CUL-3: Inadvertent discovery of previously unidentified cultural resources	The following procedure will be employed if a previously undocumented cultural resource is encountered during construction: • All work within 100 feet (30 meters) of the find will be halted or redirected by the construction foreman and protective barriers or flagging will be installed along with signage identifying the area as an “environmentally sensitive area.” Entry into the area will be limited to PG&E-approved/qualified CRSs, PG&E, and other authorized personnel. • PG&E and the CPUC will be notified immediately. • A qualified archaeologist will document the resource and coordinate with PG&E, the landowner, and the CPUC on the appropriate steps for evaluation and preservation of the find. The level of effort will be based on the size and nature of the resource, as determined by the archeologist and approved by the CPUC. • No work will occur within the environmentally sensitive area until clearance has been granted by the archaeologist or PG&E and the CPUC.

Mitigation Measure	Applicant Proposed Measure
APM CUL-4: Discovery of human remains	Environmentally sensitive area flagging and signage will only be removed when authorized by PG&E or the archaeologist and the CPUC.
APM CUL-5: Undiscovered potential tribal cultural resources	The following procedures will be implemented in the event of the discovery of human remains, in compliance with California law, including, but not limited to, the following provisions: CEQA Guidelines Section 15064.5(e); Public Resources Code Sections 5097.94, 5097.98, and 5097.99; and California Health and Safety Code Section 7050.5: Work in the immediate area within 100 feet of the find will be halted and the PG&E archaeologist, County Coroner, and CPUC will be notified immediately. Work will remain suspended until the Coroner can assess the remains. In the event the remains are determined to be prehistoric in origin, the Coroner will notify the NAHC <u>within 24 hours</u>, which will then identify an MLD. The MLD will consult with PG&E's archaeologist within 48 hours of notification to determine further treatment of the remains. The following procedure will be employed (after stopping work and following the procedure for determining eligibility in APM CUL-2) if a resource is encountered and determined by the project's qualified archaeologist to be potentially eligible for the CRHR or a local register of historic resources and is associated with a California Native American Tribe(s) with a traditional and cultural affiliation with the geographic area of the proposed project: • The project's qualified archaeologist will notify the CPUC for appropriate action. PG&E will assist the CPUC if needed to identify the lead contact person for the California Native American Tribe(s) potentially associated with the cultural resource and with a traditional and cultural affiliation with the geographic area of the proposed project. The CPUC will contact the lead contact person to set up a meeting with PG&E and the CPUC. • The project's qualified archaeologist will participate with the CPUC in discussions with the California Native American Tribe(s) to determine whether the resource is a TCR as defined by Public Resources Code Section 21074, and the tribe(s)' preferred method of mitigation, if the resource is determined to be a TCR. If no agreement can be reached for mitigation after discussions with the California Native American Tribe(s) or it is determined that the tribe(s)' preferred mitigation is not feasible, PG&E will consult with the CPUC and implement one of the example mitigation measures listed in Public Resources Code Section 21084.3(b), or other feasible mitigation.
Geology and Soils	
APM GEO-1: Protect unanticipated paleontological resource discoveries	If potential paleontological resources are discovered during construction activities, work will stop within 100 feet and the project paleontologist, <u>who meets the minimum qualification standards established by the Society for Vertebrate Paleontology</u>, will be contacted immediately. If the discovery is determined to be significant, PG&E will implement measures to protect and document the paleontological resource, as directed by the paleontologist in consultation with the landowner, PG&E, and California Department of Fish and Wildlife. Efforts will be made to retain and protect such resources in place. If recovery of those resources is required to prevent their destruction, the paleontologist will develop a recovery strategy at a level appropriate to the discovery and in accordance with industry practice. The paleontologist will supervise the recovery effort, which may include the following components as appropriate to reduce impacts to a less-than-significant level: establishing recovery standards, preparing specimens for identification and preservation,

Mitigation Measure	Applicant Proposed Measure
	documentation and reporting, and securing a curation agreement from the approved agency. Work may not resume within 100 feet of the find until approval by the paleontologist.
<u>APM GEO-2: Provide worker environmental awareness training</u>	<u>PG&E will provide environmental awareness training on paleontological resources protection when in areas with known or discovered resources. This training will include: types of paleontological resources that could occur at the project site; types of soils or lithologies in which the paleontological resources could be preserved; procedures that should be followed in the event paleontological resources are discovered; and penalties for disturbing paleontological resources.</u>
Greenhouse Gas Emissions	
APM GHG-1: Avoid and Minimize Potential Sulfur Hexafluoride (SF ₆) Emissions	For substation expansions or modifications that includes new breakers insulated with SF ₆ , PG&E will continue to include the project substation equipment in PG&E's system-wide SF ₆ emission reduction program, which includes inventorying and monitoring system-wide SF ₆ leakage rates and employing X-ray technology to inspect internal circuit breaker components to eliminate dismantling of breakers and reduce accidental releases. New project breakers will have a manufacturer's guaranteed SF ₆ leakage rate of 0.5% per year or less and will be maintained in accordance with PG&E's maintenance guidelines.

Mitigation Measure	Applicant Proposed Measure
Hazardous Materials	
APM HAZ-1: Spill Response	PG&E will implement its hazardous substance control and emergency response procedures as needed. The procedures identify methods and techniques to minimize the exposure of the public and site workers to potentially hazardous materials during all phases of construction through operation. They address worker training appropriate to the site worker's role in hazardous substance control and emergency response. The procedures also require implementing appropriate control methods and approved containment and spill-control practices for construction and materials stored on site. If it is necessary to store chemicals on site, they will be managed in accordance with all applicable regulations. Material safety data sheets shall be maintained and kept available on site, as applicable. <u>In the event that soils suspected of being contaminated (on the basis of visual, olfactory, or other evidence) are removed during site grading activities or excavation activities, the excavated soil will be tested and, if contaminated above hazardous waste levels, will be contained and disposed of at a licensed waste facility. The presence of suspected contaminated soil will require testing and investigation procedures to be supervised by a qualified person, as appropriate, to meet state and federal regulations.</u> <u>All hazardous materials and hazardous wastes shall be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. The hazardous substance control and emergency response procedures include, but are not limited to, the following:</u> <u>Proper disposal of potentially contaminated soils.</u> <u>Establishing site-specific buffers for construction vehicles and equipment located near sensitive resources.</u> <u>Emergency response and reporting procedures to address hazardous material spills.</u> <u>Stopping work and contacting the local fire department or other agencies as appropriate. Work will resume after any necessary consultation and approval by the local fire department.</u> - Emergency-spill response and clean up kits will be on site where they are immediately available to respond to an accidental release of a hazardous fluid or material. If applicable, a Stormwater Pollution Prevention Plan (SWPPP) will be implemented, which will also address spill response and other site-specific physical conditions to improve hazard prevention.
APM HAZ-2: Vehicle Refueling	No vehicles or heavy equipment will be refueled within 100 feet of a wetland, stream, or other waterway, or within 250 feet of vernal pools, unless secondary containment is used. The fueling operator must always stay with the fueling operation. Tanks may not be topped off.
Hydrology and Water Quality	
APM HYDRO-1: Develop and Implement a frac-out plan for projects using horizontal directional drilling (HDD).	For all gas projects utilizing horizontal directional drilling (HDD), PG&E will store pertinent materials on site to quickly contain potential frac-outs, and these materials will be determined by conditions on the ground. At the entry or exit of the drill and for the duration of the drilling activity, PG&E will maintain a supply of sediment barriers (e.g., weed-free straw bales and silt fence), plastic sheeting, shovels and buckets, mud pumps and additional hose, mud storage tanks, and a vacuum truck. In addition, PG&E may store sandbags, floating booms or silt curtains, plywood, a small backhoe to dig a sump, and corrugated pipe.

Mitigation Measure	Applicant Proposed Measure
	In the event of a frac-out, the release will be assessed immediately and PG&E will take the following steps: • Initiate immediate suspension of the drilling operation. • Contain the frac-out with supplies and materials as appropriate. • Verify that the drilling lubricant will not enter a jurisdictional water feature. • Assess the containment structure and determine if additional supplies and materials are needed to prevent the spread of surfaced drilling lubricant. • Determine if cleanup of the frac-out material is needed. If a frac-out is identified in a jurisdictional water feature or other sensitive resource area, the following additional steps will be taken: • PG&E will notify the appropriate agency authorities with jurisdiction (i.e., the USACE, CDFW, and RWQCB). • The drill angle will be increased to move below the frac-out and to reduce the amount of drilling lubricant reaching the surface. The current drill profile will be evaluated; and drill pressures and pump volume rates will be adjusted, as needed. • If standing water is present, hand-placed containment, silt curtains, or other containment techniques for water releases will be deployed if necessary. To the extent feasible, surface releases of excess drilling lubricant will be held in a contained area and removed using small collection sumps with portable pumps and hoses, and without undue disturbance to the banks and bed of the water feature. • Frac-out cleanup will be conducted in a manner that avoids damage to existing and adjacent vegetation. Soils that come in contact with drilling lubricant will be removed to the extent feasible without causing excessive loss of topsoil or vegetation. Once the frac-out is contained, drilling may resume upon approval from the appropriate agency officials and PG&E representatives. Frac-out material will be collected and stored in containers until it can be reused or disposed of in an approved disposal facility.
Noise	
APM NOI-1: Restrict construction hours	Planned construction activities within 900 feet of occupied residential parcels that require the use of off-road construction equipment will be consistent with local noise ordinance guidelines, which typically limit construction noise to daylight hours, or a similar restriction. Should work in these locations be required outside of these hours due to safety or clearance requirements, construction would will be limited to the minimum necessary and would will proceed as expediently as safely possible to reach a safe and convenient stopping point.
APM NOI-2: Limit noise during construction near occupied residences	When using off-road construction equipment to conduct construction activities within 250 feet of occupied residences, PG&E will use “quiet” equipment (i.e., equipment designed with noise control elements), standard equipment fitted with noise control devices (e.g., mufflers), or other noise-reduction measures as feasible to limit construction noise to within local noise ordinance limits <u>whenever feasible and within 250 feet of occupied residences.</u>

Mitigation Measure	Applicant Proposed Measure
Traffic	
APM TRA-1: Implement transportation best management practices	PG&E will continue to implement the following transportation best management practices. • Prepare and implement Traffic Control Plans as required by necessary encroachment permits to minimize disruption of roadways and of bicycle, pedestrian and transit routes to ensure the provision of adequate alternative access. • Provide through access for emergency vehicles at all times. If lane closures must occur during the course of construction, local fire and police departments will be notified to allow the design of alternative evacuation and emergency access routes. PG&E will make every effort to allow emergency service providers adequate lead time to ensure that emergency access and response times are maintained during work periods. • Maintain access for private roads. • Provide adequate off-road parking and staging for vehicles, equipment, and materials throughout the work period. • Restrict all construction parking and staging to ROW, utility-owned property and approved staging areas, and keep construction equipment in designated staging areas when not in use. • Post construction warning signs in advance of activities at the construction area and at intersections that provide access to the construction area. • Restrict all nonemergency construction traffic, including haul and delivery trucks, to normal daytime business hours, unless a local jurisdiction identifies a need for off-hours routing to avoid impacts on peak-hour commute traffic. • Avoid key commute routes and “rate-limiting” intersections during peak traffic periods, either by traveling different routes or by traveling during non-peak times as feasible, and by providing adequate parking for expanded facilities. If temporary lane closures are required, use caution signs and/or flaggers to regulate traffic, cyclists, and pedestrians to maintain a safe transportation corridor.
Wildfire	
APM FIRE-1: Construction Fire Prevention Practices	PG&E will implement the following fire prevention practices at active construction sites. • During Red Flag Warning events, as issued daily by the National Weather Service, all construction activities will cease, with an exception for transmission line testing, repairs, unfinished work, or other specific activities that may be allowed if the facility/equipment poses a greater fire risk if left in its current state. • All construction crews and inspectors will be provided with radio and cellular telephone access that is operational in all work areas and access routes to allow for immediate reporting of fires. Communication pathways and equipment will be tested and confirmed operational each day prior to initiating construction activities at each work site. All fires will be reported to the fire agencies with jurisdiction in the area immediately upon discovery of the ignition. • Construction personnel will be trained in fire-safe actions, initial attack firefighting, and fire reporting. Construction personnel will be trained and

<u>Mitigation Measure</u>	<u>Applicant Proposed Measure</u>
	equipped to extinguish small fires in order to prevent them from growing into more serious threats. • All construction personnel will carry a laminated card and be provided a hard hat sticker that list pertinent telephone numbers for reporting fires and defining immediate steps to take if a fire starts. Information on laminated contact cards and hard hat stickers will be updated as needed and redistributed to all construction personnel prior to the day the information change goes into effect. • Construction personnel will have fire suppression equipment on all construction vehicles and will be required to park vehicles away from dry vegetation. PG&E will coordinate with applicable local fire departments prior to construction activities to determine the appropriate amounts of fire equipment to be carried on vehicles and, should a fire occur, to coordinate fire suppression activities. • Water tanks and/or water trucks will be sited or available at active project sites for fire protection during construction.

Table 2-5. Other Permits and Approvals that Could Be Required for Covered Activities

Agency	Permit/Consultation/ Approval	Jurisdiction/Purpose	Notes/Assumptions
Federal Agencies			
U.S. Army Corps of Engineers	Clean Water Act Section 404 nationwide permit	Fill of waters of the United States	Permits are generally issued 45 days from submittal of a complete application; however, compliance with Section 401 must be certified first, and review under Section 7 of the federal Endangered Species, Section 106 of the National Historic Preservation Act, and CEQA must be completed.
	Clean Water Act Section 408 permit	Alteration of civil works projects	U.S. Army Corps of Engineers has 90 days to render a decision or provide an estimated date of final decision.
U.S. Fish and Wildlife Service	Consultation under Section 7 of the federal Endangered Species Act (when activity has a federal nexus)	Activities that may affect federally listed species or their habitats	Consultation can take 135 days to 1 year from submittal of the consultation request to the lead agency.
	Consultation under Section 10 of the federal Endangered Species Act	Activities that may affect federally listed species or their habitats	PG&E has a Habitat Conservation Plan that addresses federally listed species in the Bay Area.
Advisory Council on Historic Preservation	National Historic Preservation Act Section 106 review	Activities on federal land that may affect cultural or historic resources	There is no regulatory timeline for Section 106 compliance; however, a minimum of 1 year is anticipated.
Federal Aviation Administration	Aeronautical Study under 49 United States Code Section 44718, Title 17 Code of Federal Regulations, Part 77	Determination of hazard to air navigation	PG&E must file Federal Aviation Administration Form 7460-02, Notice of Actual Construction or Alteration, with the agency at least 45 days prior to construction.

Agency	Permit/Consultation/ Approval	Jurisdiction/Purpose	Notes/Assumptions
State Agencies			
State Water Resources Control Board	National Pollutant Discharge Elimination System—Construction Storm Water Permit	Storm water discharges associated with construction activities disturbing 1 or more acre of land	Permits are generally issued 10 days following the submittal of the complete notice of intent.
	National Pollutant Discharge Elimination System—Order for Discharges from Natural Gas Utility Construction, Operations and Maintenance Activities	Discharges from natural gas utility construction and maintenance activities	Submittal of completed notice of intent at least 30 days prior to discharge.
Bay Conservation and Development Commission	Maintenance permit	Discharge of dredge or fill material into the San Francisco Bay or Delta	
Coastal Commission	Coastal Development Permit	Work in coastal zone; ensure scenic integrity of and access to coastal zone	Permits are issued by local governments with certified local coastal plans or the CCC.
California Public Utilities Commission	Advice Letter, Permit to Construct, or Certificate of Convenience and Necessity	Authorized construction of non-exempt electric power line or substations facilities	Approval timing varies with the level of permitting required.
California Department of Fish and Wildlife	California Fish and Game Code Section 1600 Streambed Alteration Agreement	Activities that substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake.	Agreements are generally issued 90 days after the submittal of a complete application.
	Individual California Endangered Species Act Section 2081 Incidental Take Permit	Activities that may affect state-listed species aside from California tiger salamander, Alameda whipsnake, and California freshwater shrimp	Permits are generally issued 90 to 120 days after the submittal of the complete application but can take up to 1 year.
Regional Water Quality Control Board	Clean Water Act Section 401 Water Quality Certification	Activities authorized by federal agencies that may affect state water quality	Permits are generally issued within several months of a complete application and completed CEQA.
	Waste Discharge Requirements	Discharge of trench water or hydrostatic test water that may affect waters of the state	Notice timing varies by activity and level of analysis needed.

Agency	Permit/Consultation/ Approval	Jurisdiction/Purpose	Notes/Assumptions
State Historic Preservation Officer	Consultation	Activities that may affect cultural or historic resources	The consultation timeline assumes there would be a potential effect on historic properties and a consultation period of at least 1 year.
California Department of Transportation	Encroachment Permit ^a	Construction of facilities within, under, or over state highway rights-of-way	Permits are generally issued 60 calendar days after the submittal of a complete application and in compliance with all other statutory requirements, including CEQA.
Local Agencies			
Encroachment Permit ^a		Construction of facilities within, under, or over city or county road rights-of-way	--

^a The issuance of an encroachment permit is anticipated to require a Traffic Control Plan and a Traffic Management Plan.

2.11 References Cited

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3.0.1 Introduction

This chapter provides a resource-by-resource evaluation of the environmental impacts associated with the direct and indirect effects of the proposed issuance of the requested ITP by CDFW for PG&E's covered activities. The baseline physical conditions are defined in Section 3.1. They establish the points of comparison to evaluate whether issuance of the ITP conditioning ongoing PG&E O&M and minor new construction activities in the Permit Area would cause an incremental physical change to baseline conditions and, as a consequence, any substantial or potentially substantial adverse change to the environment. Section 3.2 describes the assumptions regarding the applicant-proposed avoidance and protection measures (see FEIR, Chapter 2, Tables 2-3 and 2-4) for PG&E's O&M and minor new construction in the Permit Area. These measures are considered in the impact evaluations to be part of the proposed project. The resource sections in Chapter 3 discuss the potential for the ITP approval and its influence on covered activities to result in a change to baseline physical conditions, assuming the implementation of the applicant-proposed avoidance, minimization, and environmental protection measures.

3.0.2 Baseline for CEQA Analysis

The State CEQA Guidelines Section 15125 provides the following guidance for establishing the baseline for environmental analysis in this EIR:

An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.

Consistent with the CEQA Guidelines, the baseline conditions for this EIR are the physical environmental conditions within the PG&E Permit Area at the time the NOP was published for this EIR (November 2017). PG&E has maintained its electrical and natural gas infrastructure per CPUC regulations, including O&M activities, for over 30 years. As such, this EIR acknowledges that PG&E's ongoing O&M activities are part of the baseline condition in the Permit Area. Against this backdrop, this EIR evaluates whether issuance of the ITP conditioning PG&E ongoing O&M and minor new construction activities in the Permit Area during the 30-year term of the permit, including habitat conservation and management activities required by the permit, would cause an incremental physical change to baseline conditions and a related substantial or potentially substantial adverse effect to the environment.

3.0.3 Analysis Methodology and Assumptions

The resource impact evaluations that follow in Chapter 3 of this EIR evaluate the potential environmental impacts resulting from CDFW discretionary approval of the proposed ITP requested

by PG&E. If approved by CDFW, the requested ITP would condition PG&E's ongoing O&M and minor new construction activities in the Permit Area during the 30-year term of the permit. The O&M activities PG&E proposes for coverage under the ITP (the "covered activities") are described in Chapter 2. As presented in Table 2-2, the covered activities, including ongoing O&M and minor new construction, would continue to cause temporary and permanent disturbance, and related physical changes that may cause an incremental change in baseline environmental conditions.

This EIR, in the resource impact evaluations that follow, evaluates and identifies the reasonably foreseeable physical changes caused by CDFW issuance of the proposed ITP, which will condition PG&E's ongoing covered activities in the Permit Area during the 30-year term of the permit. The resource impact evaluations focus on whether implementation of the covered activities as conditioned by the ITP would cause an incremental physical change to baseline environmental conditions and any substantial or potentially substantial adverse change to the environment. Where issuance of the ITP conditioning PG&E's ongoing covered activities in the Permit Area would cause any such effect (i.e., a significant effect on the environment), the resource-specific impact evaluation set forth below also identifies feasible or potentially feasible mitigation measures that, if implemented, would reduce the effect(s) to the extent feasible, consistent with CEQA.

As noted earlier, the existing environmental baseline includes past and ongoing PG&E O&M activity in the Permit Area and related physical changes to the environment. The amount of ground disturbance for PG&E's ongoing O&M and minor new construction activities has varied and will continue to vary each year depending on the type and number of O&M activities scheduled. However, based on the typical past levels of activity, the annual amount of temporary disturbance resulting from O&M and minor new construction activities in the Permit Area ranges from an estimated 165 acres to 495 acres, and permanent disturbance ranges from an estimated 35 acres to 100 acres, with averages of approximately 329 acres of temporary disturbance and 68 acres of permanent disturbance per year within the Permit Area (see Chapter 2, Project Description, Table 2-2). Amounts of annual disturbance within the Permit Area based on past activity provide a reasonable estimate for future activity under the ITP. Therefore, this estimate of annual disturbance is used in the resource sections in Chapter 3 as the environmental baseline as a gauge to evaluate the potential environmental effects of CDFW issuing the proposed ITP conditioning PG&E's ongoing O&M. In addition, the resource impact evaluations in Chapter 3 address the potential environmental impacts that may be caused as a result of the anticipated habitat conservation, enhancement, and management activities, which are also ITP-covered activities described in Section 2.7.3, *Habitat Conservation, Management, and Enhancement*, in Chapter 2 of this EIR.

The impact analyses in each resource section of this chapter rely on the following practices, incorporated into the proposed covered activities, that will avoid and substantially lessen to the extent feasible, and minimize potentially significant impacts to the ITP-covered species and CDFW trust resources:

1. PG&E's existing environmental screening process (see Section 2.9, *Overview of PG&E's Environmental Review Process*) would be implemented for the covered activities;
2. PG&E's Bay Area O&M HCP measures, including field protocols (FPs), best management practices (BMPs), and avoidance and minimization measures (AMMs) (see Section 2.10, *Project Measures to Reduce Impacts* and Table 2-3) would be implemented for the covered activities;
3. PG&E's applicant proposed measures (APMs) (see Section 2.10, *Project Measures to Reduce Impacts* and Table 2-4) would be implemented for the covered activities; and

4. PG&E's annual reporting pursuant to the ITP would include documentation to confirm implementation of these measures within covered species habitat and to summarize the mitigation ratios and credits that were debited from its mitigation credit portfolio for covered activities during the previous calendar year (see Section 2.10, *Project Measures to Reduce Impacts*).

These practices are considered in the impact evaluations prior to determining the significance conclusion of each impact.

As explained in Section 2.8.3, *Variability of Implementation*, the schedule for O&M and minor new construction activities varies—different types of equipment or facility components may be inspected regularly (daily, monthly, quarterly, annually, or less frequent schedule). However, the same equipment, facilities or components also have a variable service life and require replacement when equipment becomes unserviceable or damaged due to weather or vandalism. Towers, conductors, or pipelines, for example, tend to have decades-long service life with infrequent replacement, although subcomponents of those facilities may require maintenance or replacement on a more frequent but difficult to predict schedule. PG&E often sets up temporary programs to consolidate and oversee similar types of work, such as facility access, vegetation clearing, or equipment replacements or upgrades. Further, variation is present across activities, as shown in Chapter 2, Table 2-2, and in the approach to conducting work for larger activities (e.g., E9, line reconductoring). Large-scale activities may employ a mix of construction-related methods to complete an activity safely and efficiently. For example, even a relatively short electric transmission reconductoring effort may involve different approaches to access each pole or tower location because of variations in topography or vegetation. Different means of access can be used, depending on time, costs, and project need. Use of a helicopter to bring personnel or equipment to a project site is sometimes preferable to constructing a road for such purposes and can be used to save time, reduce cost, or avoid environmental resources. Therefore, PG&E relies on the ability to adapt to variable situations to perform its O&M and minor new construction work.

PG&E's ongoing activities are also guided by regulatory obligations under state and federal law to address system safety and reliability requirements. Therefore, O&M activities are sometimes initiated as a result of urgent situations, emergencies, or environmental factors (i.e., weather, accidents) and the resulting effects on the durability and condition of existing equipment. Under these circumstances, it may not be feasible for PG&E to modify its work locations, work equipment, work practices, or construction schedule (including the seasonality of work). The ITP would, in addition to addressing routine O&M activities, provide for such urgent, emergency, and weather circumstances and enable PG&E to fulfill its regulatory requirements when system reliability and public safety is at risk.

The analysis in this EIR is focused on whether issuance of the proposed ITP, to the extent it conditions PG&E's covered activities, will cause a physical change to baseline conditions and result in a substantial or potentially substantial adverse change to the environment (i.e., a significant effect on the environment). Recognizing the proposed ITP addresses three listed species, the EIR evaluates potential impacts on those species, their habitats, and CDFW's trust resources located where the otherwise prohibited "take" of the listed species, as defined by the Fish and Game Code, is a potential outcome. Therefore, the biological resources impact evaluation in Section 3.4 is the focus of this EIR. For the other resource topics, the potential environmental impacts of the ITP are evaluated in the context of the state and federal regulatory framework within which PG&E operates, PG&E's

standard practices, and the implementation of the voluntary applicant avoidance and minimization measures described in Chapter 2, Table 2-3 and 2-4.

3.1 Aesthetics

3.1.1 Existing Conditions

3.1.1.1 Regulatory Setting

Federal

Pacific Gas and Electric Company's (PG&E) facilities cross a variety of federal lands throughout the San Francisco Bay Area (Bay Area). These lands include lands owned by multiple federal agencies including the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service (USFWS), U.S. Bureau of Land Management (BLM), U.S. Bureau of Reclamation, National Park Service (NPS), and U.S. Coast Guard. There are no National Forest lands within the study area. The BLM and NPS, specifically, include measures to protect aesthetic and visual resources within their management plans.

Bureau of Land Management

The BLM has developed the Visual Resource Management (VRM) system that provides methods and protocols for assessing existing visual resource conditions and changes to the visual landscape. All BLM lands are assigned BLM VRM Class Objectives that serve for the basis of managing visual resources on BLM lands and assessing impacts on those lands. BLM VRM Class Objectives are contained within each Resource Management Plan prepared for recreational areas that are managed by the BLM.

National Parks

National Parks are required to prepare general management plans that "set long-term goals for the park and provide broad direction for resource preservation and visitor use," which includes protecting scenic resources. In addition, National Parks are required to conduct a Visual Resource Inventory to "provide consistent evaluation of park visual resources by assessing the scenic quality and important characteristics of key views within and beyond park boundaries." Visual Resource Inventories are intended to establish baseline visual conditions at the park for monitoring visual changes over time, a reference for evaluating visual impacts associated with a proposed project, the management and planning of visual resources in parks, and the means to engage in collaborative scenic conservation (National Park Service Park Planning 2020).

State

California Scenic Highway Program

The California Legislature initiated the California Scenic Highway Program (Streets and Highways Code Section 260 et seq.) in 1963, with the goal of preserving and protecting the state's scenic highway corridors from changes that would diminish their aesthetic value. The State Scenic Highway System consists of eligible and officially designated routes. A highway may be identified as eligible for listing as a state scenic highway if it offers travelers scenic views of the natural landscape, largely undisrupted by development. Eligible routes advance to officially designated state scenic highway status when the local jurisdiction adopts ordinances to establish a scenic corridor

protection program and receives approval from the California Department of Transportation (Caltrans).

Once a highway attains designated status, the corridor is monitored by the state and the designation may be revoked if a local government fails to enforce the provisions of the corridor protection program. While there are no restrictions on scenic highway projects, local agencies and Caltrans must work together to coordinate transportation and development projects and ensure the protection of the corridor's scenic value to the greatest extent possible. In some cases, local governments have their own land use and site planning regulations in place to protect scenic values along a designated corridor.

California State Parks

California State Parks must have an approved general plan before any major park facilities can be developed and must have policies in place to protect aesthetic and scenic resources. The Planning Handbook developed by the planning division of California State Parks requires general plans to contain a description and analysis of the sensory impressions that are considered significant to the visitor experience (California State Parks 2010). Individual state parks must provide protection to the following scenic resources: visual resources and scenic characteristics, distinctive park visual areas and viewsheds, designated scenic areas or routes, designated overlooks and viewpoints, and external views.

California Public Utilities Commission

Section 320 of the California Public Utilities Code requires all future electric and communication distribution facilities to be placed underground if they are proposed to be erected in proximity to any highway designated as a state scenic highway pursuant to Streets and Highways Code Section 260 of the California Public Utilities Code, and would be visible from such scenic highways if erected above ground, whenever feasible and not inconsistent with sound environmental planning. Any exceptions must be approved by the California Public Utilities Commission (CPUC).

Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local discretionary regulations. For informational purposes and to assist with the California Environmental Quality Act (CEQA) review process, this section includes a discussion of local standards that concern the visual character of the study area.

General Plans

California law requires local jurisdictions (including counties and cities) to develop comprehensive, long-term general plans to guide their land use decision making and physical development (Government Code Section 65300). Of the seven required "elements," or chapters, in a general plan, several relate directly or indirectly to the aesthetic issues faced by a community as it manages its growth. For instance, the land use element identifies an appropriate balance and distribution of the various types of land uses (e.g., residential, commercial, industrial, recreational) present in a community. The conservation element establishes guidelines for the conservation and use of the area's natural resources, including rivers, streams, and lakes; forest lands; soil resources; and mineral deposits. The open-space element contains goals and strategies to preserve open space for a range of purposes, including outdoor recreation. General plans may also contain additional elements

on topics of concern to the local community; common themes that bear on aesthetics and visual resources include recreation and parks, community design, and heritage or cultural resources. Some communities also adopt ordinances or municipal code provisions in support of specific aesthetic or community design goals.

City and county general plans may include policies for protection of scenic resources, such as hillsides, natural areas, landmarks, roads, and historic districts. Such policies may restrict new development in areas that maintain scenic vistas or areas that contain important character-defining structures. Additionally, design guidelines established at the local level may establish specific standards for addressing development where local character and/or important visual resources may be affected.

PG&E is not required to comply with local aesthetic regulations because cities and counties do not have jurisdiction over PG&E's utility projects. The design, construction and operation of public utility facilities are within the exclusive jurisdiction of the CPUC. The appearance of electrical and natural gas infrastructure reflects its utilitarian power-delivery function, but electrical and natural gas facilities are common features in the visual landscape throughout the Bay Area. Although the safe and efficient function of utility facilities may necessarily take priority over aesthetic values, most operations and maintenance (O&M) and minor new construction activities produce no more than an incremental change to the existing visual environment. In addition, when locating certain electrical facilities, PG&E is required under General Order 131-D to consult with local jurisdictions concerning land use matters and provide notice for certain O&M and minor new construction activities. For both electric and natural gas projects, PG&E will obtain all applicable encroachment and other ministerial permits.

Open Space Easement Act of 1974

Cities and counties can use open space easements as a mechanism to preserve scenic resources if they have adopted open-space plans, as provided by the Open Space Easement Act of 1974 (Government Code Sections 51070–51097). According to this act, a city or county may acquire or approve an open-space easement through a variety of means, including use of public money.

3.1.1.2 Environmental Setting

Regional and Local Landscape Setting

The visual setting of the study area is characterized by the various land uses and environmental characteristics that exist across the nine Bay Area counties. Agricultural lands, open space, and the Pacific Ocean coastline provide some of the key aesthetic resources. The study area is composed of four general physiographic regions: coastal areas, uplands of the Coast Ranges, intermountain valleys, and the Sacramento–San Joaquin River Delta (Delta). In addition to the Delta, other major waterbodies in the study area include the Russian River and Napa River watersheds, San Pablo Bay, San Francisco Bay, and the Pacific Ocean. The land use types in the study area identified in Table 3.11-1 in Section 3.11, *Land Use*. As shown in this table, a majority (over half) of the study area is composed of forested lands and grasslands. However, the majority of PG&E facilities, as discussed in the Project Description, are located in urban areas (61%) and only 32% are in natural land cover types and 7% are in agricultural areas. Natural land cover types, such as forested lands and grasslands, would be affected to a much lesser extent. Elevations in the study area range from at or below sea level at the Delta Islands near Brentwood and Oakley, to the 4,216-foot peak of Mount

Diablo, the highest peak in the study area. The foothills have gently to steeply sloping topography that supports woodland and shrub land. Agricultural lands, including vineyards, row crops, and orchards, are found along the valley floors of Marin, Napa, Sonoma, Solano, and Santa Clara Counties.

Open space areas such as wildlife refuges, local community parks, and recreational areas are present throughout the study area. National parks, refuges, and wildlife areas present within the study area include: San Francisco Bay National Wildlife Refuge Complex (Alameda, Contra Costa, Napa, San Francisco, Solano, and Sonoma Counties); Muir Woods National Monument and Point Reyes National Seashore (Marin County); and Golden Gate National Recreation Area (GGNRA) (Marin, San Francisco, and San Mateo Counties). Other open-space areas include California Department of Fish and Wildlife ecological reserves and wildlife areas, such as the Albany Mudflats Ecological Reserve in Alameda County and the Petaluma Marsh Wildlife Area in Sonoma County, as well as numerous California State Parks such as Mount Diablo in Contra Costa County and Henry W. Coe in Santa Clara County.

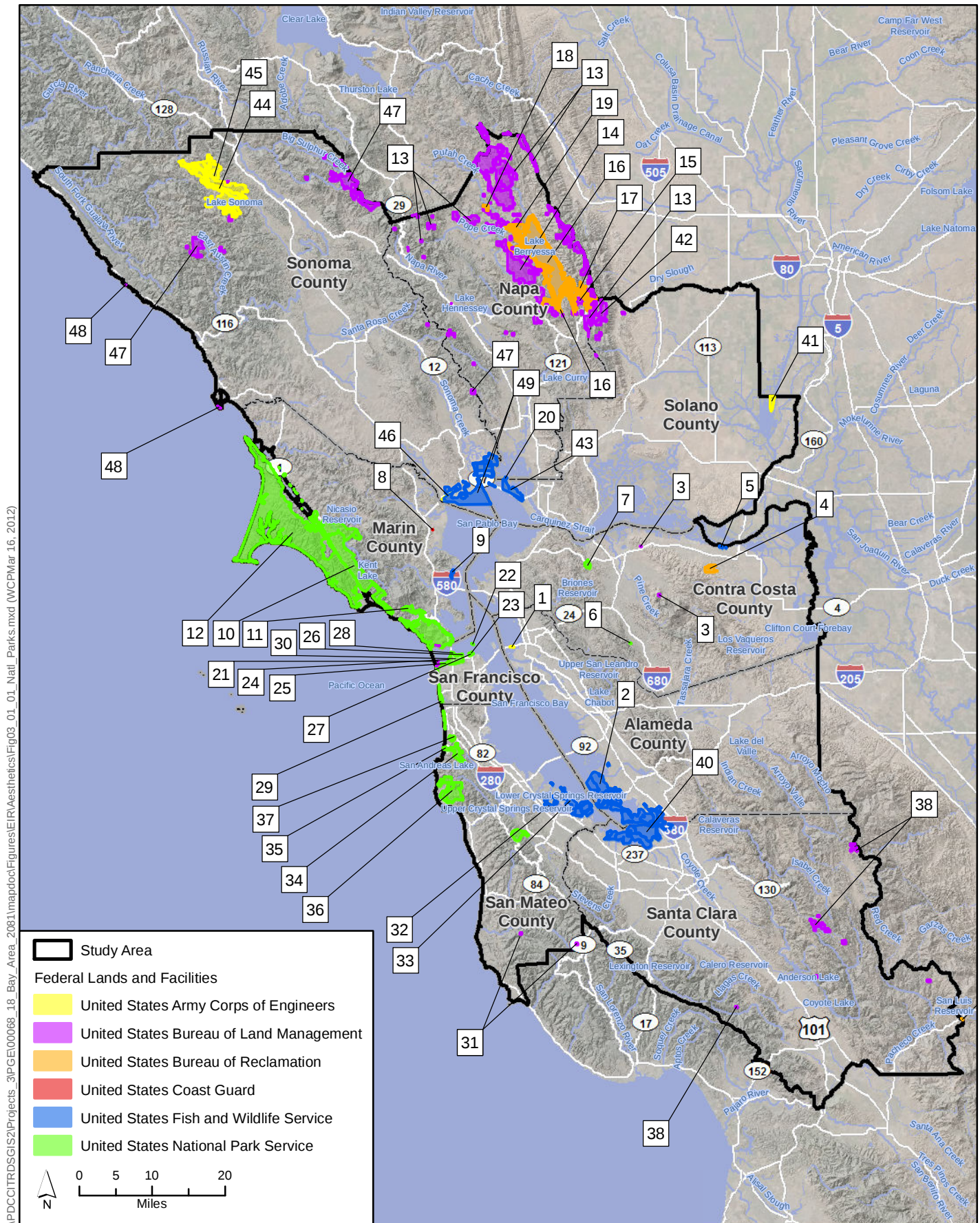
Views along roads and highways in the study area vary from essentially undisturbed views of rural open space, the ocean, and coastal landscapes to crowded urban settings with limited distant views. PG&E facilities and infrastructure are located throughout the study area. These facilities are part of the existing visual setting of the area, and the visibility of the facilities varies depending on their locations and proximity to key viewpoints, such as scenic highways or overlooks. There are dozens of federal and state recreational facilities with frequent visitor usage and scenic resources throughout the study area.

Federal Lands and Facilities

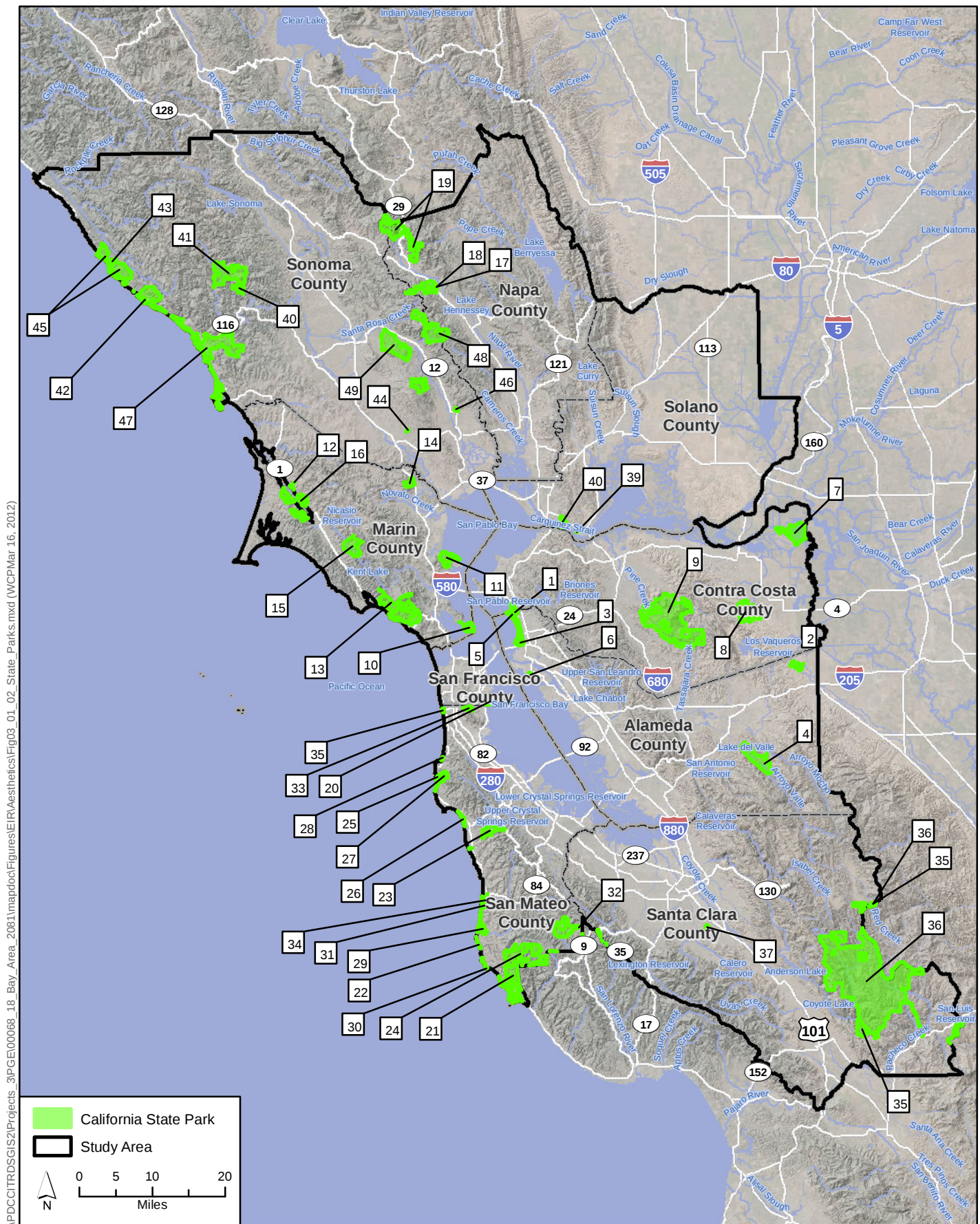
Federal recreational lands and facilities in the study area are listed in Table 3.1-1 and shown on Figure 3.1-1.

Table 3.1-1. Federal Recreational Lands in the Study Area

County	Agency	Recreational Feature	Corresponding Feature Number on Figure 3.1-2
Alameda	USACE	East Bay Gateway Shoreline	1
	USFWS	Don Edwards National Wildlife Refuge	2
Contra Costa	BLM	BLM	3
	Reclamation	Contra Loma Regional Park	4
	USFWS	Antioch Dunes National Wildlife Refuge	5
	NPS	Eugene O'Neill Historic Site	6
		John Muir National Historic Site	7
Marin	Coast Guard	United States Coast Guard Park	8
	USFWS	Marin Island National Wildlife Refuge	9
	NPS	Golden Gate National Recreation Area	10
		Muir Woods National Monument	11
		Point Reyes National Seashore	12



**Figure 3.1-1
Federal Recreational Lands in
the Permit Area**



**Figure 3.1-2
State Parks in the Permit Area**

County	Agency	Recreational Feature	Corresponding Feature Number on Figure 3.1-2
Napa	BLM	BLM	13
		Cedar Roughs Area of Critical Environmental Concern	14
		Quail Ridge Reserve	15
	Reclamation	Lake Berryessa	16
		Lake Berryessa Wildlife Area	17
		Reclamation	18
		Reclamation	19
	USFWS	San Pablo Bay National Wildlife Refuge	20
San Francisco	BLM	California Coastal National Monument	21
		Alcatraz Island	22
		Aquatic Park	23
		Baker Beach	24
	NPS	China Beach	25
		Crissy Field	26
		Fort Mason	27
		Fort Point National Historic Site	28
		Golden Gate National Recreation Area	29
		Presidio	30
San Mateo	BLM	BLM	31
	USFWS	Bair Island Ecological Reserve	32
		Don Edwards National Wildlife Refuge	33
		Golden Gate National Recreation Area	34
	NPS	Mori Point	35
		Rancho Corral de Tierra	36
		Sky Ridge	37
Santa Clara	BLM	BLM	38
	Reclamation	San Luis Reservoir Wildlife Area	39
	USFWS	Don Edwards National Wildlife Refuge	40
Solano	USACE	Little Holland Tract	41
	BLM	BLM	42
	USFWS	San Pablo Bay National Wildlife Refuge	43
Sonoma	USACE	Lake Sonoma Recreation Area	44
		Lake Sonoma Wildlife Area	45
		Sonoma Baylands	46
	BLM	BLM	47
		California Coastal National Monument	48
	USFWS	San Pablo Bay National Wildlife Refuge	49

Key scenic areas in the study area are described in the following subsections.

Golden Gate National Recreation Area

The study area encompasses the GGNRA, which spans the Marin Peninsula north to Point Reyes National Seashore and much of the northern and western coastline of the San Francisco Peninsula. The GGNRA is one of the largest urban parks in the world and contains Alcatraz Island, Crissy Field, the Presidio, the Marin Headlands, Muir Woods National Monument, and many other attractions including museums (National Park Service 2019a). The Golden Gate National Recreation Area/Muir Woods National Monument General Management Plan indicates that the purpose of the GGNRA is to “offer national park experiences to a large and diverse urban population while preserving and interpreting the outstanding natural, historic, scenic, and recreational values of the park lands.” Scenic beauty is identified as one of the GGNRA’s key resources and values, with the Plan noting that “the scenic beauty of the park include the extraordinary setting, which provides a dramatic contrast to urban environments and undeveloped spaces and the compelling historical background that contributes to understanding the history of the area” (National Park Service 2014). The recreation area affords its visitors expansive scenic vistas and views of the Pacific Coastline, San Francisco Bay, Golden Gate Bridge, San Francisco cityscape, and the many natural and historic areas associated with the recreation area.

Muir Woods National Monument

The Muir Woods National Monument is located within the GGNRA and is a primeval forest with old growth coast redwoods. The monument is managed under the Golden Gate National Recreation Area/Muir Woods National Monument General Management Plan that identifies that monument’s purpose as to “preserve the primeval character and ecological integrity of the old growth redwood forest for scientific values and inspiration” (National Park Service 2014). The park has 6 miles of trails that afford visitors views of the old growth coast redwoods, in addition to other flora and fauna of the forest. The park is also surrounded by, and many of its trails connect to, Mount Tamalpais State Park (National Park Service 2019b).

Point Reyes National Seashore

Point Reyes National Seashore is located west of the northernmost edge of the GGNRA and is bordered by the mainland, Pacific Ocean, Drakes Bay, Tomales Bay, Bolinas Bay, and Bolinas Lagoon. The Point Reyes National Seashore notes that “the unusual variety of scenic qualities and biotic communities that make the seashore attractive to scientists as well as recreationists will be aggressively maintained” because much of the national seashore is designated as wilderness (National Park Service 1980). Sweeping scenic vistas and picturesque views of the surrounding waterbodies and landscapes of the national seashore are afforded from Point Reyes.

Juan Bautista de Anza National Historic Trail

The study area encompasses a portion of the Juan Bautista de Anza National Historic Trail. The NPS is working toward establishing a continuous, 1,200-mile nonmotorized recreation trail that will roughly follow the historic route of the Anza Expedition of 1775–1776. Approximately 300 miles of recreation trail have been certified so far and each segment is independently operated (National Park Service 2017). The Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan identifies that its management objective is to “protect a trail [right-of-way] ROW, 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 by the effects of

urbanization and changing transportation systems, which is characteristic of the trail within the study area.

Recreational trails, which are a part of the trail system, cross the study area including existing and planned segments of the San Francisco Bay Trail near Alviso Marina County Park and the Alameda Creek Trail. In addition, the Don Edwards San Francisco Bay National Wildlife Refuge is identified as an interpretive site for the trail (National Park Service 2016).

San Francisco Bay National Wildlife Refuge Complex

The San Francisco Bay National Wildlife Refuge Complex is a collection of seven national wildlife refuges administered by the USFWS. The study area encompasses five of the seven refuges: Antioch Dunes National Wildlife Refuge, Don Edwards San Francisco Bay National Wildlife Refuge, Farallon National Wildlife Refuge, Marin Islands National Wildlife Refuge, and the San Pablo Bay National Wildlife Refuge. The refuges were established to preserve habitat for migratory birds, endangered species, and other wildlife. Pertaining to visual resources, the National Wildlife Refuge System guiding principle is to preserve wildlife-dependent uses involving hunting, fishing, wildlife observation, photography, interpretation, and education (U.S. Fish and Wildlife Service 2020).

California State Parks

A total of 49 California State Parks are within the study area (Table 3.1-2 and Figure 3.1-2) (California Department of Parks and Recreation 2020).

Table 3.1-2. California State Parks in the Study Area

County	California State Park	Corresponding Feature Number on Figure 3.1-2
Alameda	Albany State Marine Reserve	1
	Bethany Reservoir State Recreation Area	2
	Emeryville Crescent State Marine Reserve	3
	Lake Del Valle State Recreation Area	4
	McLaughlin Eastshore State Park State Seashore	5
	Robert W. Crown Memorial State Beach	6
Contra Costa	Franks Tract State Recreation Area	7
	Marsh Creek State Park State Historic Park	8
	Mount Diablo State Park	9
Marin	Angel Island State Park	10
	China Camp State Park	11
	Marconi Conference Center State Historic Park	12
	Mount Tamalpais State Park	13
	Olompali State Historic Park	14
	Samuel P. Taylor State Park	15
	Tomales Bay State Park	16
Napa	Bale Grist Mill State Historic Park	17
	Bothe-Napa Valley State Park	18
	Robert Louis Stevenson State Park	19

County	California State Park	Corresponding Feature Number on Figure 3.1-2
San Francisco	Candlestick Point State Recreation Area	20
San Mateo	Año Nuevo State Park	21
	Bean Hollow State Beach	22
	Burleigh H. Murray Ranch Park Property	23
	Butano State Park	24
	Gray Whale Cove State Beach	25
	Half Moon Bay State Beach	26
	Montara State Beach	27
	Pacifica State Beach	28
	Pescadero State Beach	29
	Pigeon Point Light Station State Historic Park	30
	Pomponio State Beach	31
	Portola Redwoods State Park	32
	San Bruno Mountain State Park	33
	San Gregorio State Beach	34
	Thornton State Beach	35
Santa Clara	Henry W. Coe State Park	35
	Martial Cottle Park State Recreation Area	37
Solano	Benicia State Recreation Area	38
	Benicia Capitol State Historic Park	39
Sonoma	Armstrong Redwoods State Natural Reserve	40
	Austin Creek State Recreation Area	41
	Fort Ross State Historic Park	42
	Kruse Rhododendron State Natural Reserve	43
	Petaluma Adobe State Historic Park	44
	Salt Point Park	45
	Sonoma State Historic Park	46
	Sonoma Coast State Park	47
	Sugarloaf Ridge State Park	48
	Trione-Annadel State Park	49
Source: California Department of Parks and Recreation 2020		

Scenic Highways

Many of the highways in the Bay Area have been officially designated or determined eligible for designation as state scenic highways, as indicated in Table 3.1-3. These highways provide scenic views of the coast, ocean, open space, agricultural lands, and other visually appealing settings. No national scenic byways have been designated in the study area.

Table 3.1-3 identifies designated and eligible state scenic highways, as of September 2020, in the study area. All 34 of these highway segments, both designated and eligible, are considered in this analysis.

Table 3.1-3. State Scenic Highways and Routes in the Study Area

Highway Segment ^a	Mileposts	Study Area Counties	Status
1 Santa Cruz County line to south city limit Half Moon Bay	0.0–26.2	San Mateo	Designated
1 SR 101 near Marin City to SR 101 near Leggett	0.0–105.6	Marin, Sonoma	Eligible
1 SR 35 in San Francisco to SR 101 near Golden Gate Bridge	1.9–7.1	San Francisco	Eligible
1 SR 101 near San Luis Obispo to SR 35 near Daly City	16.7–1.9	San Francisco, San Mateo	Eligible
4 SR 160 near Antioch to SR 84 near Brentwood	31.1–40.5	Contra Costa	Eligible
9 Santa Cruz County line to Los Gatos city limit	0.0–10.8	Santa Clara	Designated
12 Danielli Avenue east of Santa Rosa to London Way near Aqua Caliente	22.4–34.0	Sonoma	Designated
12 SR 101 near Santa Rosa to SR 121 near Sonoma	16.0–41.4	Sonoma	Eligible
17 SR 1 near Santa Cruz to SR 9 near Los Gatos	0.0–7.1	Santa Clara	Eligible
24 East portal of Caldecott Tunnel to Interstate 680 near Walnut Creek	0.3–9.1	Contra Costa	Designated
29 Trancas Street in Napa to SR 20 near Upper Lake	13.0–52.5	Napa	Eligible
29 SR 37 near Vallejo to SR 221 near Napa	4.7–8.7	Solano, Napa	Eligible
35 Santa Cruz County line to Half Moon Bay Road (SR 92)	0.0–23.0	San Mateo	Designated
37 SR 251 near Nicasio to SR 101 near Novato	0.0–11.2	Marin	Eligible
37 SR 101 near Ignacio to SR 29 near Vallejo	11.2–9.5	Marin, Sonoma, Solano	Eligible
80 Interstate 280 near First Street in San Francisco to SR 61 in Oakland	3.2–2.8	San Francisco, Alameda	Eligible
84 SR 238 (Mission Boulevard) to Interstate 680	10.8–17.9	Alameda	Designated
92 SR 1 to Interstate 280	0.0–7.3	San Mateo	Eligible
101 Opposite San Francisco to SR 1 in Marin City	0.0–4.1	Marin	Eligible
101 The vicinity of SR 37 near Ignacio	19.1–20.9	Marin	Eligible
116 SR 1 to south city limit of Sebastopol	0.0–27.8	Sonoma	Designated
121 SR 37 near Sears Point to SR 12 near Sonoma	0.0–7.5	Sonoma	Eligible
121 SR 221 near Napa Street to Trancas Street in Napa	6.0–9.4	Napa	Eligible
152 County line to county line	22.1–13.9	Santa Clara	Eligible
160 SR 4 near Antioch to Sacramento	0.0–36.0	Contra Costa	Eligible

Highway Segment ^a	Mileposts	Study Area Counties	Status
221 SR 29 at Soscol Road to SR 121 in Napa	0.0–2.7	Napa	Eligible
239 Interstate 580 west of Tracy to SR 4 near Brentwood	0.0–7.0	Alameda, Contra Costa	Eligible
251 SR 37 near Nicasio to SR 1 near Point Reyes	0.0–5.1	Marin	Eligible
280 Santa Clara County Line to north city limit of San Bruno	0.0–21.8	San Mateo	Designated
280 SR 17 to Interstate 80 near First Street in San Francisco	5.4–7.0	Santa Clara, San Mateo, San Francisco	Eligible
580 San Joaquin County line to SR 205	0.0–0.4	Alameda	Designated
580 San Leandro city limit to SR 24 in Oakland	34.5–45.2	Alameda	Designated
680 Mission Boulevard in Fremont to Contra Costa County line	6.4–21.9	Alameda	Designated
680 Alameda County line to SR 24	0.0–14.4	Contra Costa	Designated

Source: California Department of Transportation 2019

^a Portions of the scenic highway segment may extend beyond the study area.

SR = State Route

Several designated landscaped freeways within the study area are considered in this analysis. These include 208 road segments across the nine-county study area. These include portions of State Routes 1, 4, 13, 17, 24, 29, 37, 84, 85, 87, 92, 113, 237, 238, 242, 260, Interstates 80, 280, 380, 580, 680, 780, 880, 980, and U.S. Highway 101 (California Department of Transportation 2020).

Scenic Vistas

Scenic vistas in the Bay Area, such as vistas of the ocean, the Marin headlands, the East Bay hills including Mount Diablo, and San Bruno Mountain, are visible from hills and ridgelines surrounding San Francisco Bay and from many locations along the coast and throughout the nine counties in the Bay Area. Scenic vistas are also visible from waterbodies, such as from San Pablo Bay and San Francisco Bay, and include views of the water and surrounding shorelines, urban skylines, and foothills and mountains. Scenic vistas are also available along drainages and deltas, where levees allow for views out and over the landscape. In addition, scenic vistas may occur in rural, agricultural areas where flat terrain and a lack of obstructions often allow for expansive views toward the surrounding landscape.

Light and Glare

The study area is made up of many types of land use and environmental characteristics such as agricultural lands, urban areas, open space, and the Pacific Ocean coastline. There are numerous sources of light and glare. Urban areas are heavily lit due to commercial development including light from building interiors and exteriors, street lighting, landscape lighting, and vehicle lights. Remote and more rural areas generally contain fewer light sources.

Glare is caused by either direct light from the sun or moon, artificial light sources, or by a reflective surface. In rural and semi-developed areas, natural sources are the primary source of glare. Agricultural land cover produces varying levels of glare based on surface area, reflectiveness, and coloring. The San Francisco Bay and Pacific Ocean also are sources of daytime glare.

3.1.2 Environmental Impacts

3.1.2.1 Methods for Analysis

Typically, the analysis of impacts on aesthetics is based on three key parameters:

- The visual character and scenic quality of potentially affected visual resources at the project site, in the immediate project vicinity, and in the surrounding region.
- The visibility of the project site and vicinity to members of the public.
- Public viewer response to the potentially affected visual resources.

Although a majority of O&M activities and minor new construction activities would take place within or immediately adjacent to existing PG&E rights-of-way (ROWs), the precise locations of individual activities on these lands are not foreseeable at this time; therefore, it is not possible to identify either the specific views that would be affected or the likely viewer populations and their concerns. O&M activities currently occur at routine intervals and would continue to be temporary in nature. As a result, this analysis focuses on identifying the general types of visual changes that could result from the O&M activities and minor new construction activities and determining which changes could adversely affect visual resources or the viewer experience. Activities-Minor new construction, particularly such as the construction of natural gas pressure limiting stations (PLSS) and, substation expansions, or new power lines have the potential to affect visual resources; however, because specific impacts (i.e., specific locations affected and the nature and extent of visual changes) cannot be identified at this time, this document focuses on identifying applicant proposed measures (APMs) (see Table 2-4 of this EIR) that will provide an appropriate level of visual resources protection.

Impacts related to aesthetics or visual resources were assessed qualitatively based on professional judgment in light of the nature of the covered activities. The impact analysis in this chapter focuses on the potential for the O&M activities and minor new construction activities to substantially degrade or otherwise substantially adversely affect the visual setting or character of the study area, particularly in or near scenic areas. Because PG&E has conducted O&M activities in the study area for more than 30 years, ongoing O&M and minor new construction activity impacts are considered part of the baseline environmental conditions, described in this section represent baseline environmental conditions that would not change following approval of the Incidental Take Permit (ITP).

PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures

As part of compliance with PG&E's *Bay Area Operations and Maintenance Habitat Conservation Plan* (Bay Area O&M HCP), PG&E would implement the following practices and field protocols (FPs) with regard to aesthetics and visual resources (see Table 2-3 of this EIR).

- FP-02: Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
- FP-03: Use existing access and ROW roads. Minimize the development of new access and ROW roads, including clearing and blading for temporary vehicle access in areas of natural vegetation.
- FP-04: Locate off-road access routes and work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).

- FP-07: Vehicle speeds on unpaved roads will not exceed 15 miles per hour.
- FP-08: Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.
- FP-10: Minimize the activity footprint and minimize the amount of time spent at a work location to reduce the potential for take of species (which would reduce the area and duration of visual disturbances).
- FP-11: Utilize standard erosion and sediment control best management practices (pursuant to the most current version of Permittee's *Stormwater Field Manual for Construction Best Management Practices*) to prevent construction site runoff into waterways.
- FP-14: If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial "weed free" seed mix.
- Conducting work in a manner that reduces the potential to damage adjacent trees, including affecting riparian and wetland areas (FP-16, FP-17, Hot Zone-1, Hot Zone-2, Wetland-1, and Wetland-2).
- Trash Abatement: PG&E will initiate a trash abatement program before starting covered activities and will continue the program for the duration of the project. PG&E will ensure that trash and food items are contained in animal-proof containers and removed at least once a week to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.
- Good Housekeeping: PG&E will initiate general practices that keep a construction site clean and neat including storing building materials and equipment in construction staging areas or away from public view; and promptly removing construction debris at regular intervals.

In addition to PG&E's practices and FPs from PG&E's Bay Area O&M HCP, PG&E will implement the following APMs with regard to aesthetics and visual resources (see Table 2-4 of this EIR).

APM AES-1: Restore disturbed areas

Previously vegetated areas greater than 0.10 acre that are disturbed by the project will be recontoured to their approximate original conditions and reseeded with an appropriate native seed mix to minimize scarring.

APM AES-2: Protect scenic vistas and scenic highways

For minor new construction facilities larger than 1.0 acre that would have a substantial adverse effect on a scenic vista or views, a designated scenic highway or a scenic public viewpoint, the facility will be relocated to an area not visible from the scenic vista, designated state scenic highway, or scenic public viewpoint. If a reasonably feasible alternate location is not available, implement APM AES-5 or AES-6, as appropriate to the facility, to reduce substantial adverse effects to less-than-significant levels by design or screening measures. PG&E will consult with local jurisdictions and parks agencies as appropriate to discuss reasonably feasible options regarding location and visual screening.

APM AES-3: Shield temporary construction lighting

Construction activities will cease 30 minutes before sunset and will not begin prior to 30 minutes after sunrise, where feasible. Night work will be limited in extent, duration, and

brightness, to the extent possible. If temporary construction lighting is required, PG&E will use shielded construction light fixtures, or otherwise screen or direct lighting away from nearby residences, except in cases of emergency.

APM AES-4: Apply minimum lighting standards

All artificial outdoor lighting will be limited to lighting for safety and security, and designed using Illuminating Engineering Society's design guidelines, International Dark-Sky Association-approved fixtures, or other industry standards that address lighting impacts. Lighting above ground level will generally be directed downward or inward, where consistent with safety concerns, and shielding or other methods will be utilized, where needed, to minimize light scatter off site. Light fixtures will have non-glare finishes that will not cause reflective daytime glare. Lighting will be designed for energy efficiency, where feasible.

APM AES-5: Reduce visibility of new structures in sensitive landscapes

Within sensitive landscapes, PG&E will design structures associated with minor new construction to minimize any impacts on the existing visual character caused by the introduction of new structures in sensitive landscapes, such as in, along, or near national, state, or local parks, recreation areas, forests, scenic routes, vista views, or similar. To the extent feasible and consistent with safety, visible pipelines, guardrails, and substation and switching station infrastructure within such areas will be of a non-reflective material that helps surfaces to blend better with the surroundings.

In scenic or visually sensitive areas, PG&E will implement aesthetic design features in new concrete or shotcrete buildings that are visible to the public. These features may include mimicking natural material (e.g., stone or rock surfacing) or integral color, in the same theme as the surrounding area, to reduce visibility and to better blend with the landscape.

APM AES-6: Implement landscape buffers or other screening for minor new construction

Landscaping treatments may be utilized to help to maintain the local character, improve aesthetics, create a visual buffer between sensitive viewers and minor new construction facilities, and diminish the visual scale of proposed features to reduce substantial adverse aesthetic impacts to a less-than-significant level. Other measures, such as installing prefabricated walls or fencing, may also be utilized to reduce the visual impacts of minor new construction that is visible to the public. Drought-resistant native trees, shrubs, and/or an herbaceous understory will be used in such landscaping to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained. PG&E will adhere to the following practices in implementing landscape or other screening buffers for minor new construction where necessary to reduce substantial adverse aesthetic impacts:

- Design and implement low-impact development (LID) measures that disperse and reduce runoff by using such features as vegetated buffer strips between paved areas that catch and infiltrate runoff, bioswales, cisterns, and detention basins. In addition, pervious paving will be evaluated for use in the proposed project to improve infiltration and to reduce the amount of surface runoff from entering waterways and the stormwater system. However, LID measures will not be used where infiltration could result in adverse environmental effects.

- Drought-resistant vegetative accents and screening will be considered to aid in a perceived reduction in the scale and mass of large built features in visually sensitive areas, while accentuating the design treatments that will be applied to built features. Plant selection will be based on the ability to screen built features and provide aesthetic accents.
- Use native grass and wildflower seed in erosion control measures where such a measure will improve aesthetics. Species will be chosen that are native and indigenous to the area and for their appropriateness to the surrounding habitat. If not appropriate to the surrounding habitat, wildflowers should not be included in the seed mix.
- Under no circumstances will any invasive plant species be used at any location.
- Maximize the use of planting zones that do not need irrigation, such as seeding with a native grassland and wildflower meadow mix, which reduce or eliminate the need for a permanent irrigation system.
- A prefabricated wall or fencing may be installed as appropriate to provide partial screening of the natural gas or expanded electric substation facilities. The design of the wall or fence will be comparable to or complement the existing substation screening or nearby land uses.
- No screening measures will degrade or eliminate scenic vistas or be designed in a manner that negatively affects views from scenic roadways. In addition, these measures will not be implemented where implementation would constitute an adverse effect upon sensitive habitats or sensitive species.

Significance Criteria

In accordance with Appendix G of the State CEQA Guidelines, the potential significance of impacts on aesthetics from the proposed project and implementation of covered activities was evaluated for each of the following criteria:

- 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 scenic highway.
- Substantial degradation of the existing visual character or quality of the site and its surroundings.
- Introduction of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

3.1.2.2 Impact Discussion

As described in Chapter 3.0.2, *Baseline for CEQA Analysis*, PG&E's ongoing O&M activities are part of the CEQA environmental baseline. Although CDFW's issuance of the Incidental Take Permit (ITP) would not change the need or overall extent of the work that will be required within the next 30 years on PG&E's natural gas and electric systems in the Bay Area, it would include requirements for avoiding and minimizing take of the three covered species, which may alter the approach for carrying out O&M and minor new construction activities by shifting disturbance area locations, limiting timing, or implementing physical actions to protect the species and their habitat. The direct and indirect impacts of covered O&M and minor new construction activities that could occur as a result of CDFW issuing the ITP are the focus of the following environmental analysis. The potential

environmental impacts are evaluated in the context of the state and federal regulatory framework within which PG&E operates, PG&E's standard practices, and the implementation of the voluntary applicant avoidance and minimization measures described in Chapter 2, Tables 2-3 and 2-4.

Impact AES-1: Potential to have a substantial adverse effect on a scenic vista (Less-than-Significant Impact)

O&M activities could continue to result in short-term, temporary visual disturbance related to the following: ground disturbance or other earthwork; the presence of vehicles, personnel, and supplies in undeveloped areas; glare generated by reflections from metal and glass vehicle surfaces; and introduction of high-intensity nighttime construction lighting. O&M activities may also include tree pruning, minor vegetation clearing, and repair and replacement of transformers or other features at substations, and reconductoring. Although O&M activities may be visible to the public in certain portions of the study area, the activities are not expected to degrade the visual character in the area because O&M activities would continue to involve the maintenance of existing facilities, as has been done for years. Because O&M activities are ongoing and not expected to change with issuance of the proposed ITP, any effects of O&M activities on a scenic vista are part of baseline environmental conditions.

As explained further in Chapter 2, Project Description, mMinor new construction activities could continue to create both temporary and longer-term or permanent changes in the visual landscape. As described in Section 3.1.1.2, *Environmental Setting*, over half of PG&E existing facilities would occur in urban areas, ~~and~~ forested lands, grasslands, agricultural lands, wetlands, and shrublands would be affected to a much lesser extent. Temporary changes from minor new construction would include activities such as trenching or boring, grading, and creating temporary work areas and access roads. These types of temporary visual changes are currently occurring throughout the project area. Such visual changes would generally affect limited areas within or adjacent to a PG&E ROW or utility property, but would be consistent with the general visual character of the area, which is typically dominated by existing power delivery infrastructure. The FPs from PG&E's Bay Area O&M HCP (see Table 2-3 of this EIR) will also minimize temporary visual impacts by minimizing the construction footprint and by ensuring that trash is not left onsite and work areas are restored. Impacts from O&M activities would be short-term and less than significant. In addition, APM AES-1 would further reduce less-than-significant impacts on scenic vista views by ensuring that disturbed areas are recontoured and revegetated with a native seed mix. As discussed under Impact AES-4, it is anticipated that the need for nighttime construction would be minimal with minor construction activities and impacts would be less than significant. APM AES-3 would require nighttime construction lighting to be directed away from nearby residences, further reducing potential impacts.

Permanent visual changes associated with minor new construction would include ~~new gas and electric line extensions~~, electric substation expansions, and new gas PLSs adjacent to existing facilities. These facilities could introduce new changes that could affect views within scenic vistas and, in particular, within scenic viewsheds associated with national parks and recreation areas and state parks. However, most aboveground structures would have relatively small footprints and would either be low profile (e.g., gas facilities) or be consistent with existing overhead utilities (e.g., electrical line ~~extensions~~). Where there is a potential for significant impacts from these new facilities, APM AES-1 and APM AES-3 would reduce impacts by restoring disturbed areas and minimizing construction lighting. In addition, for highly visible new or expanded facilities that could cause a substantial adverse effect on ~~within~~ a scenic vista, PG&E ~~has proposed~~ will implement

additional APMs that would reduce potential substantial adverse effects from these covered activities. APM AES-2 would require relocation of such facilities where feasible, design and screening measures (APM AES-5 or -6) where relocation is not feasible, and consultation with local jurisdictions and park agencies for input on minimizing visual impacts. APM AES-4 would require minimum lighting standards in facilities to minimize offsite illumination. APM AES-5 would ensure that new facility coloring reduces the visibility of new structures in or visible from sensitive landscapes, including national parks and recreation areas, state parks, and scenic vistas. APM AES-6 would require landscape buffers or other screening to minimize views of new or expanded facilities within sensitive viewsheds. Implementation of these measures would reduce the impacts on scenic vistas from PG&E's minor new construction to a less-than-significant level.

Issuance of the proposed ITP would not result in a substantial adverse effect on a scenic vista. The ITP would not substantially change PG&E's ongoing O&M activities, minor new construction would result in facilities adjacent to and consistent with existing infrastructure, and APMs will be implemented. The ITP-related habitat preservation would not result in adverse effects to aesthetics, light, or glare because it would preserve natural habitat and would not introduce new development, lighting, or infrastructure. Therefore, aesthetic impacts from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AES-2: Potential to substantially damage scenic resources along a scenic highway (Less-than-Significant Impact)

Several scenic highways are present in the study area (Table 3.1-3). CPUC regulations prohibit the installation of overhead distribution facilities in proximity to any officially designated state or county scenic highway if the facilities would be visible to travelers on that highway (California Public Utilities Code Section 320). Limited exceptions must be approved by the CPUC and would be subject to environmental review, which would be consistent with implementation of APM AES-2.

Although O&M activities are implemented throughout the Permit Area including areas adjacent to or in the viewshed of a state scenic highway, ongoing O&M activities are existing activities that are temporary and short term (i.e., lasting less than 3 months) are expected to continue and are considered part of environmental baseline conditions.

However, as described under Impact AES-1, minor new construction activities may expand facilities such as substations or result in new facilities that are visible from a scenic highway. Such changes could affect views associated with scenic highways. Similar to impacts described in Impact AES-1, impacts on scenic resources along a scenic highway could potentially be significant if minor new construction expands, extends or adds new facilities in a manner that has the potential to substantially damage ~~detracts from~~ views associated with scenic highways. However, FPs from PG&E's Bay Area O&M HCP (see Table 2-3 of this EIR) would minimize temporary visual impacts by minimizing the construction footprint and ensuring that trash is not left onsite and work areas are restored. In addition, implementation of APMs AES-1 and AES-2 would reduce impacts on scenic highways by ensuring that areas disturbed by covered activities are restored and revegetated with native seed and that larger scale changes are evaluated under a separate visual impact assessment. Additionally, APM AES-5 would ensure that new facility coloring or other design features reduces the visibility of new structures in sensitive landscapes, such as views from scenic highways. APM AES-6 would require installation of landscape buffers to screen new or expanded facilities visible within scenic highway viewsheds. Implementation of these measures would reduce impacts on scenic highways to a less-than-significant level.

Issuance of the proposed ITP would not substantially damage scenic resources along a scenic highway. The ITP would not substantially change PG&E's ongoing O&M activities, minor new construction would result in facilities adjacent to and consistent with existing infrastructure, and APMs will be implemented. The ITP-related habitat preservation would not result in adverse effects to aesthetics because it would preserve natural habitat and would not introduce new development, lighting, or infrastructure. Therefore, aesthetic impacts along scenic highways from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AES-3: Degradation of the existing visual character or quality of the site and its surroundings in non-urbanized areas or conflict with applicable zoning and other regulations governing scenic quality in urbanized areas (Less-than-Significant Impact)

As discussed in Chapter 2, *Project Description*, 61% of PG&E's existing facilities are located in urban land cover types, 32% are located in natural land cover types and 7% are in agricultural land cover.

Current O&M activities would continue to be implemented in areas supporting existing utility infrastructure that have been subjected to prior ground disturbance. PG&E standard practices require work crews to follow good construction site housekeeping practices to minimize construction-related visual disturbance: maintaining sites in a clean, orderly condition; storing building materials and equipment in construction staging areas or away from public view; and promptly removing construction debris at regular intervals. Additionally, FP-14, from PG&E's Bay Area O&M HCP (see Table 2-3 of this EIR), will return or revegetate disturbed areas to their pre-disturbance conditions, which would ensure minimal alterations in the visual character over the long term. Impacts from these temporary construction activities would be less than significant.

Some O&M activities could result in changes to the type of structures used along an existing electric transmission or distribution corridor, such as upgrading wooden utility poles that are buried to tubular steel poles with a concrete foundation. Some of these existing lines could be associated with viewsheds in national or state parks and recreation areas. Such facility replacements could result in changes noticeable to some viewers. However, given that these existing utility lines would already be visible linear features in the area, the changes to the support structures would likely be incremental and would not constitute a substantial change to the existing visual character and quality of the landscape within sensitive viewsheds.

Many minor new construction projects would entail some vegetation clearing and some degree of earthwork at the work site and possibly also at a nearby construction laydown or staging area, if staging cannot be accommodated at the work site. Vegetation removal creates a temporarily denuded surface that may contrast with the surrounding area in terms of color and visual texture. Grading further modifies the work site by producing barren cut-and-fill areas; it may also create slopes that are unnaturally steep or unnaturally flat compared with the surrounding area. Visual changes associated with vegetation removal and grading would begin early in the construction period. Depending on the nature of the surrounding vegetation (e.g., chaparral, woodland, landscaping), vegetation removal could continue to be apparent for some time; topographic alterations could remain for a longer term. In addition, permanent visual changes associated with minor new construction would include new gas and electric line extensions, electric substation expansions, and new gas PLSs adjacent to the existing ROW or existing facilities. These facilities could visually degrade an area. Some minor new construction would result in expanded aboveground facilities larger than 0.10 acre and would have the potential to result in a substantial change to the existing visual character and quality of affected sites.

The severity of these impacts would be dependent on the nature of the surrounding viewshed and the characteristics of the viewing population. Most new aboveground structures would have relatively small footprints and would either be low profile (e.g., gas facilities) or be consistent with existing overhead utilities (e.g., electrical distribution line ~~extensions~~). In general, new or modified facilities would be minor and are not expected to result in extensive disturbance or substantial alterations to the visual character of non-urbanized areas.

Implementation of FPs and APMs (see Tables 2-3 and 2-4 of this EIR) would reduce impacts on views by ensuring that areas disturbed by covered activities are restored and revegetated (FP-14) and (APM AES-1) and that larger scale changes are evaluated under a separate visual impact assessment (APM AES-2). Implementation of APM AES-5 would ensure that new facility coloring reduces the visibility of new structures in sensitive landscapes, such as views from residential areas or state parks, and APM AES-6 would require installation of landscape buffers to screen new or expanded facilities visible within sensitive viewsheds. Implementation of these measures would reduce impacts on the existing visual character and quality of views in non-urbanized areas to a less-than-significant level.

As described in Section 3.1.1.1, *Regulatory Setting*, PG&E is not required to comply with local aesthetic regulations because cities and counties do not have jurisdiction over PG&E's utility projects. The design, construction and operation of public utility facilities are within the exclusive jurisdiction of the CPUC. Because of the nature of much of PG&E's infrastructure, the appearance of electrical and natural gas infrastructure reflects its power delivery function. However, utility facilities are existing visual elements throughout the Bay Area. Implementation of APMs would reduce impacts on views, as described above, and reduce conflicts with regulations protecting aesthetic resources in urbanized areas. In addition, when locating certain electrical facilities, PG&E is required under General Order 131-D to consult with local jurisdictions concerning land use matters and provide notice for certain O&M and minor new construction activities. Some projects require discretionary permits from the CPUC or other agencies. For both electric and natural gas projects, PG&E will obtain all applicable permits, including local encroachment and other ministerial permits. Therefore, it is anticipated that such features will result in less-than-significant visual impacts in urbanized areas.

Issuance of the proposed ITP would not result in degradation of the existing visual character or quality of the site and its surroundings in non-urbanized areas or conflict with applicable zoning and other regulations governing scenic quality in urbanized areas. The ITP would not substantially change PG&E's O&M activities, minor new construction would result in facilities adjacent to and consistent with existing infrastructure, and APMs will be implemented. The ITP-related habitat preservation would not result in adverse effects to aesthetics because it would preserve natural habitat and would not introduce new development, lighting, or infrastructure. Therefore, aesthetic impacts from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AES-4: Introduction of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area (Less-than-Significant Impact-with Mitigation)

O&M activities involve existing facilities, and, therefore, would not result in any new light or glare. In addition, most O&M activities do not require artificial lighting. Because O&M activities are ongoing, any effects related to light or glare are part of baseline environmental conditions not expected to change; no new incremental impacts are expected from issuance of the requested ITP.

Minor new construction may result in the need for short-term and temporary night lighting for constructing at night (e.g., an extended tie-in operation). Implementation of APM AES-3 would ensure that night lighting would be directed at the construction activity and away from residences so that impacts associated with temporary construction lighting would be less than significant.

Facilities that would add pavement, cement block, metal, glass, painted wood, or other potentially reflective surfaces to the viewshed could increase reflective glare. Implementation of APM AES-5 would ensure the facilities are colored in a manner to reduce reflective glare. In addition, implementation of APM AES-6 would reduce reflective glare by requiring installation of a landscape buffer to help screen potential new sources of glare for sensitive viewers. These measures would ensure that impacts associated with daytime glare would be less than significant.

In general, PG&E does not install permanent lighting for new permanent aboveground facilities unless safety concerns mandate lighting. Some facilities may require security lighting to be upgraded or for nighttime security lighting to be installed. Implementation of APM AES-4 would reduce permanent lighting impacts by ensuring that lighting is directed downward or inward. However, depending on the design of new facilities and the nature of surrounding land uses, increases in glare or nighttime lighting could pose a concern for viewers in public spaces if proper shielding is not provided. Such impacts would be most pronounced in residential areas, where viewer sensitivity is particularly high. It could also be a concern in open space, where viewer sensitivity is high and there is additional potential to disturb sensitive nocturnal or crepuscular wildlife. Implementation of APM AES-4 would lessen the effects of light and glare by requiring that artificial outdoor lighting be limited to safety and security lighting designed using Illuminating Engineering Society's design guidelines, and in compliance with International Dark-Sky Association approved fixtures or other industry standards that address lighting impacts. With implementation of these APMs, potential impacts would be less than significant.

Issuance of the proposed ITP would not introduce a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. The ITP would not substantially change PG&E's O&M activities, minor new construction would result in facilities adjacent to and consistent with existing infrastructure, and APMs will be implemented. The ITP-related habitat preservation would not result in adverse effects to aesthetics, light, or glare because it would preserve natural habitat and would not introduce new development, lighting, or infrastructure.

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3.2 Agricultural and Forestry Resources

3.2.1 Existing Conditions

3.2.1.1 Regulatory Setting

Federal

No federal regulations related to agricultural or forestry resources are applicable to the project.

State

Farmland Mapping and Monitoring Program

The California Department of Conservation, under the Division of Land Resource Protection, has established the Farmland Mapping and Monitoring Program (FMMP) to monitor the conversion of the state's farmland to and from agricultural use. The FMMP is a nonregulatory program that produces maps and statistical data for analyzing impacts on California's agricultural resources. Through this program, agricultural land is rated according to soil quality and irrigation status (Figure 3.2-1).

Forest Taxation and Reform Act

Commercial timberlands are afforded protection through the state's Forest Taxation Reform Act of 1976, which mandates the creation of timberland preserve zones (TPZ) to restrict and protect commercial timber resources.

Public Resources Code Section 51104(g) defines a *TPZ* as an area that has been zoned pursuant to California Government Code Section 51112 or 51113 and is devoted to and used for growing and harvesting timber and compatible uses. In this context, compatible uses include any use that "does not significantly detract from the use of the property for, or inhibit, growing and harvesting timber" (California Government Code Section 51104[h]).

Williamson Act

The California Land Conservation Act of 1965, commonly known as the Williamson Act (California Government Code Section 51200 et seq.), is designed to preserve agricultural and open-space land. It establishes a program of private landowner contracts that voluntarily restrict land to agricultural and open-space uses (Figure 3.2-2). In return, Williamson Act parcels receive a lower property tax rate consistent with their actual use instead of their market value. Lands under contract may also support uses that are "compatible with the agricultural, recreational, or open-space use of [the] land" subject to the contract (California Government Code Section 51201[e]).

Section 51238(a) provides that utility facilities are generally considered compatible uses:

(1) Notwithstanding any determination of compatible uses by the county or city pursuant to this article, unless the board or council after notice and hearing makes a finding to the contrary, the erection, construction, alteration, or maintenance of gas, electric, water, communication, or agricultural laborer housing facilities are hereby determined to be compatible uses within any agricultural preserve.

(2) No land occupied by gas, electric, water, communication, or agricultural laborer housing facilities shall be excluded from an agricultural preserve by reason of that use.

California Public Resources Code

The California Public Resources Code contains the following definitions for forest land, timberland.

Section 12220(g) defines *forest land* as:

land that can support 10-percent 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.

Section 4526 defines *timberland* as:

land, other than land owned by the federal government and land designated by the [State Board of Forestry and Fire Protection] as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees.

Local

Because the California Public Utilities Commission has exclusive jurisdiction over the siting, design, and construction of Pacific Gas and Electric Company (PG&E) electric and gas facilities, the project is not subject to local land use and zoning regulations or discretionary permits. The following discussion is provided for information purposes and to assist with California Environmental Quality Act (CEQA) analysis.

General Plans

California law requires counties and cities to develop comprehensive, long-term general plans to guide their land use decision making and physical development. Of the seven required “elements,” or chapters, in a general plan, several relate directly or indirectly to agriculture, primarily with regard to how local jurisdictions will manage growth. For instance, the land use element identifies an appropriate balance and distribution of the various types of land uses (e.g., residential, commercial, industrial, recreational) present in a community. The conservation element establishes guidelines for the conservation and use of the area’s natural resources, including rivers, streams, and lakes; forest lands; soil resources; and mineral deposits. The open-space element contains goals and strategies to preserve open space for a range of purposes, including agriculture. None of these elements are likely to be relevant to the proposed project.

3.2.1.2 Environmental Setting

Current and Historical Agricultural Uses

The study area has a significant amount of land in agricultural uses. Table 3.2-1 shows the acres of agricultural lands for each county in the region, excluding San Francisco County. In 2017, less than 50% of the region’s approximately 4.5 million acres were being farmed. Of the farmed land, 346,672 acres were harvested croplands and 315,133 acres were irrigated for crop production. The remaining 1,978,640 acres are designated as “land in farms,” which consists primarily of agricultural land used for pasture and grazing. Data from 2020 is not available because the census is conducted every 5 years.

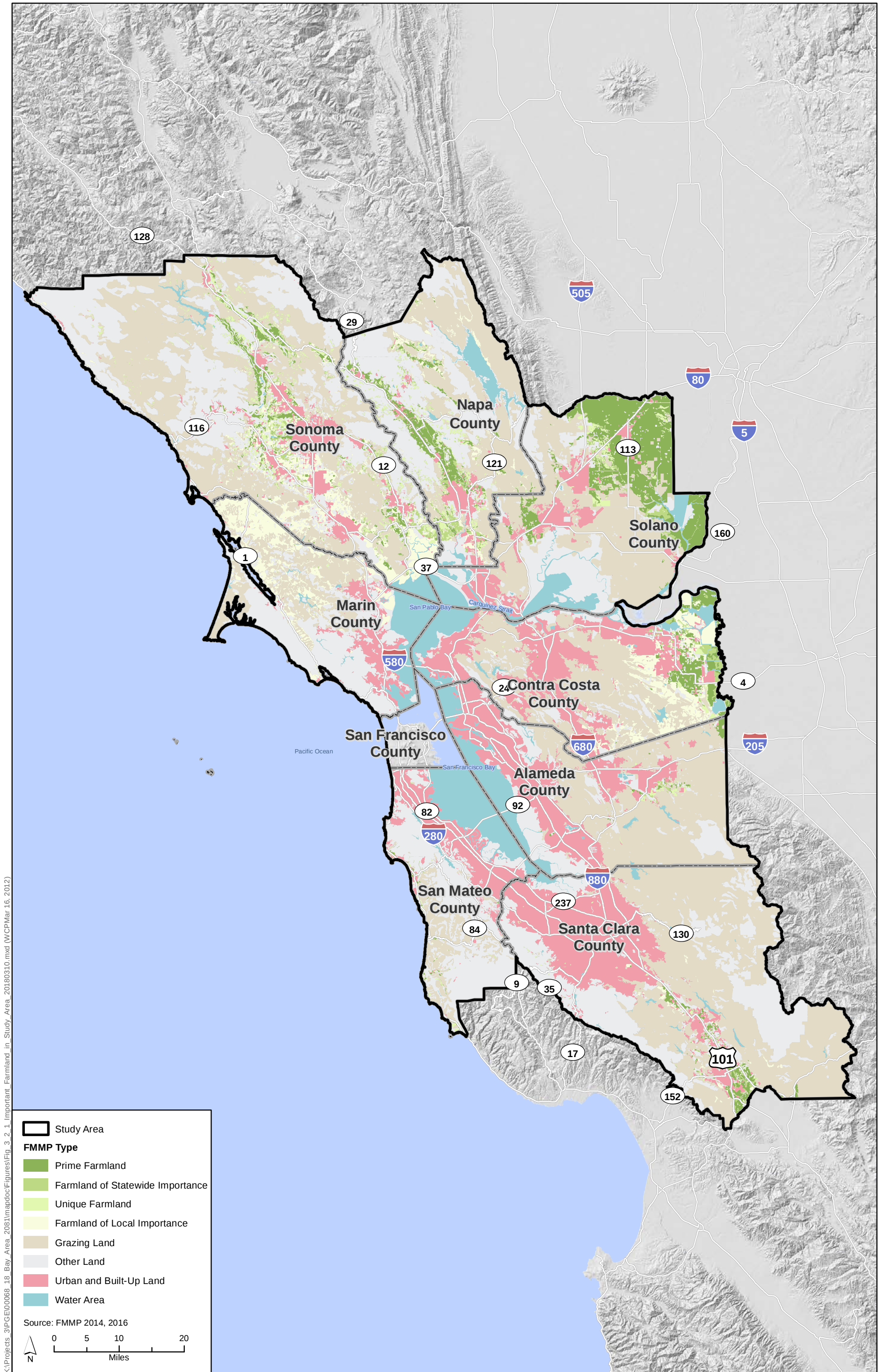
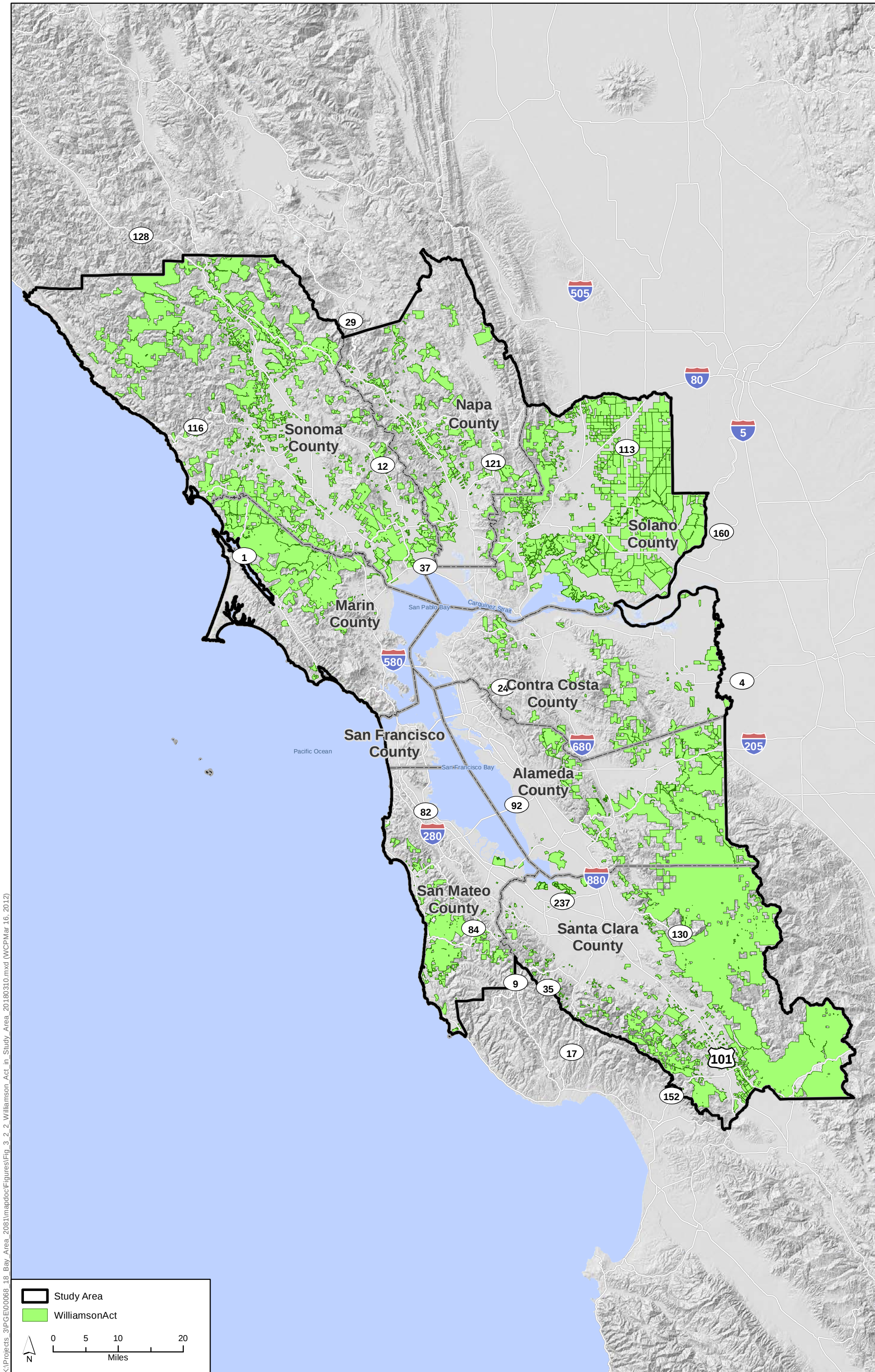


Figure 3-2.1
Important Farmland in the Study Area



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Figure 3-2.2
Williamson Act Contracts in the Study Area

Since 1984, a large amount of Important Farmland land in the study area has been converted to urban uses. According to the FMMP, approximately 101,852 acres of Important Farmland have been converted to nonagricultural use since 1984 (California Department of Conservation 2017).

Table 3.2-1. Study Area^a Agricultural Lands, 2017

	Alameda County	Contra Costa County	Marin County	Napa County	San Mateo County	Santa Clara County	Solano County	Sonoma County	Study Area
	Acres								
Land in Farms	183,282	155,572	140,075	255,778	45,972	288,084	342,593	567,284	1,978,640
Harvested Cropland	7,247	30,142	10,142	60,978	3,774	21,369	115,902	97,118	346,672
Irrigated Land	7,511	22,625	4,978	60,945	3,023	19,222	110,396	86,433	315,133

Source: U.S. Department of Agriculture 2017.

^a San Francisco County not shown because of its negligible acreages.

Williamson Act Lands

Agricultural land under Williamson Act contract includes both “prime” and “nonprime” lands. The California Land Conservation Act defines *prime agricultural land* as: (1) land with U.S. Department of Agriculture Class I or II soils; (2) land with Storie Index soil rating 80 to 100; (3) land that has returned a predetermined annual gross value for 3 of the past 5 years; (4) livestock-supporting land with a carrying capacity of at least 1 animal unit per acre; or (5) land planted with fruit or nut trees, vines, bushes, or crops that have a non-bearing period of less than 5 years and that will normally return a predetermined annual gross value per acre per year during the commercial bearing period (Government Code Sections 51200–51207). *Nonprime* lands include pasture and grazing lands and other non-irrigated agricultural land with lesser quality soils. Prime agricultural lands under the Williamson Act are defined differently than Prime Farmland under the Department of Conservation FMMP.

In the period 2014–2015, about 1.2 million acres of land were under Williamson Act contract in the San Francisco Bay Area (Bay Area). Of this, about 204,080 acres were Prime Farmland and 969,497 acres were nonprime. Study area lands under Williamson Act contract, therefore, are primarily used for pasture and grazing and not for the cultivation of crops. Nearly 72% of prime and nonprime lands under contract in the study area are in Santa Clara, Solano, and Sonoma Counties. Table 3.2-2 shows the number of acres of land under Williamson Act contracts in the Bay Area as of 2014.

Table 3.2-2. Williamson Act Contracts in the Bay Area, 2014–2015

County ^a	Prime Farmland	Nonprime Farmland	Total	Percent
Alameda	2,510	133,137	135,647	11.5%
Contra Costa	9,306	34,231	43,537	3.7%
Marin	0	80,853	80,853	6.9%
Napa	19,059	52,522	71,580	6.1%
San Mateo	No data ^b	No data	No data	No data
Santa Clara	9,668	295,546	305,214	26.0%
Solano	119,799	145,335	265,134	22.6%

County ^a	Prime Farmland	Nonprime Farmland	Total	Percent
Sonoma	43,738	227,873	271,611	23.1%
Region	204,080	969,497	1,173,576	100.0%

Source: California Department of Conservation 2016a.

^a San Francisco County is not shown due to its negligible acreages.

^b San Mateo County has not reported data for the past several years. Acreages for this county are not included in the total, but Williamson Act lands are shown for the county in Figure 3.2-2.

According to geographic information systems (GIS) mapping of the study area by ICF in 2018, PG&E has approximately 1,757 miles of electric distribution, 760 miles of electric transmission, 39 miles of gas distribution, and 198 miles of gas transmission in lands under Williamson Act contract.

Important Farmland

The FMMP maps agriculturally viable lands and designates a hierarchy of land quality in relation to agriculture. Land rated as Prime Farmland has the soil characteristics, growing season, and moisture supply necessary for sustained high yields. Farmland of Statewide Importance is similar to Prime Farmland but with minor shortcomings, such as steeper slopes or less ability to store soil moisture than Prime Farmland. Unique Farmland is of lesser soil quality. Grazing Land supports vegetation suitable for livestock grazing (California Department of Conservation 2008). The FMMP also recognizes Farmland of Local Importance, which is designated by a county board of supervisors.

According to GIS mapping of the study area by ICF in 2018, PG&E's electric and gas transmission and distribution facilities in the study area include 1,391 miles within Prime Farmland, 434 miles within Unique Farmland, and 323 miles within Farmland of Statewide Importance. The vast majority of PG&E's electric and gas transmission and distribution facilities, 37,324 miles, are within Urban and Built-up Land, followed by land designated Other Land at 4,533 miles.

The acres of Important Farmland in each county as well as the totals for each of type of land designation are presented in Table 3.2-3.

Table 3.2-3. Acreage of Important Farmland, 2016

County ^a	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Grazing Land
Alameda	3,433	1,109	2,259	0	241,169
Contra Costa	25,502	7,436	3,543	52,431	167,567
Marin	0	141	280	63,345	88,806
Napa	30,619	9,593	16,803	18,326	179,202
San Mateo	1,946	141	2,149	716	49,122
Santa Clara	15,691	3,383	2,440	5,105	393,535
Solano	130,843	6,674	10,346	0	208,189
Sonoma	29,899	17,203	33,398	80,940	416,291
Totals	237,933	45,680	71,218	220,863	1,743,881

Source: California Department of Conservation 2016b.

^a San Francisco County is not shown because of its negligible acreages of farmland.

Forest

The Bay Area is home to a variety of forest types spread throughout the nine-county region. Forests are generally located at higher elevations of the Coast Ranges in areas with sufficient moisture. Forest land is a valuable environmental and aesthetic resource and a defining feature in many parts of the landscape in the Bay Area. Forest habitats include a wide range of woodland and forest species. Forests in California are protected by the California Department of Forestry and Fire Protection.

Most counties in the study area do not contain land zoned for forest land, timberland, or TPZ. San Mateo County has 31,055 acres of TPZ, and Sonoma County has 95,239 acres of TPZ. TPZ in the study area is shown on Figure 3.2-3.

3.2.2 Environmental Impacts

3.2.2.1 Methods for Analysis

The impact analysis in this section focuses on evaluating the potential impacts of PG&E's covered activities included in issuance of the Incidental Take Permit (ITP) that may result in the conversion of FMMP-designated agricultural lands to nonagricultural uses and to generate conflict with existing Williamson Act contracts in the study area. Potential impacts were evaluated qualitatively, based on professional judgment in light of the activities, methods, and techniques that are part of PG&E's Bay Area operations and maintenance (O&M) program. Because PG&E has conducted O&M activities in the study area for more than 30 years, the ongoing O&M impacts are considered part of the baseline environmental conditions. ~~described in this section represent baseline environmental conditions that would not change following approval of the ITP.~~

PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures

PG&E strives to avoid and minimize impacts on farmers, ranchers, and agricultural operations. PG&E works within its property rights and with farmers and ranchers to schedule project work, to the extent feasible, around their harvest and planting periods in order to minimize disruptions to agricultural operations. Access across active fields is negotiated with the farmer or landowner in advance of large maintenance and minor new construction activities. In areas containing permanent crops (e.g., grape vines, orchard crops) that must be removed to gain access to work locations, PG&E provides compensation to the farmer or landowner as needed.

PG&E will also implement the following applicant proposed measure (APM) to reduced impacts associated with minor new construction activities (see Table 2-4 of the EIR).

APM AG-1: Coordination with farmers and ranchers regarding construction activities

Coordination will include the following:

- **Advance Notice:** Prior to construction, PG&E will give at least 30 days advance notice of the start of construction-related activities to farmers and ranchers. Notification will be provided by mailing notices to all properties within 300 feet of the project route. The announcement will (1) describe where and when construction is planned, and (2) provide a point of contact for complaints related to construction activities.

- PG&E will work with farmers and ranchers to schedule project work, to the extent feasible, around their harvest and planting periods in order to minimize disruptions to agricultural operations. If PG&E does not have specific access rights, access across active fields will be negotiated with the farmer and/or landowner in advance of any construction activities. In areas containing permanent crops (e.g., grape vines, orchard crops) that must be removed to gain access to pole sites for construction purposes, the PG&E will provide fair market compensation to the farmer and/or landowner.

Significance Criteria

In accordance with Appendix G of the State CEQA Guidelines, the potential significance of impacts on agricultural and forestry resources resulting from the proposed project and implementation of covered activities was evaluated for each of the following criteria:

- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Important 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 cause rezoning of forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]).
- 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 Important Farmland to nonagricultural use or conversion of forest land to non-forest use.

3.2.2.2 Impact Discussion

As described in Chapter 3.0.2, *Baseline for CEQA Analysis*, PG&E's ongoing O&M activities are part of the CEQA environmental baseline. Although CDFW's issuance of the Incidental Take Permit (ITP) would not change the need or overall extent of the work that will be required within the next 30 years on PG&E's natural gas and electric systems in the Bay Area, it would include requirements for avoiding and minimizing take of the three covered species, which may alter the approach for carrying out O&M and minor new construction activities by shifting disturbance area locations, limiting timing, or implementing physical actions to protect the species and their habitat. The direct and indirect impacts of covered O&M and minor new construction activities that could occur as a result of CDFW issuing the ITP are the focus of the following environmental analysis. The potential environmental impacts are evaluated in the context of the state and federal regulatory framework within which PG&E operates, PG&E's standard practices, and the implementation of the voluntary applicant avoidance and minimization measures described in Chapter 2, Tables 2-3 and 2-4.

Impact AG-1: Conversion of Important Farmland to nonagricultural use (Less-than-Significant Impact)

O&M and minor new construction activities ~~currently take place under existing conditions~~ are ongoing and not expected to substantially change with issuance of the proposed ITP. Although O&M activities could potentially disrupt the use of farmlands that are classified as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, these impacts would be temporary and

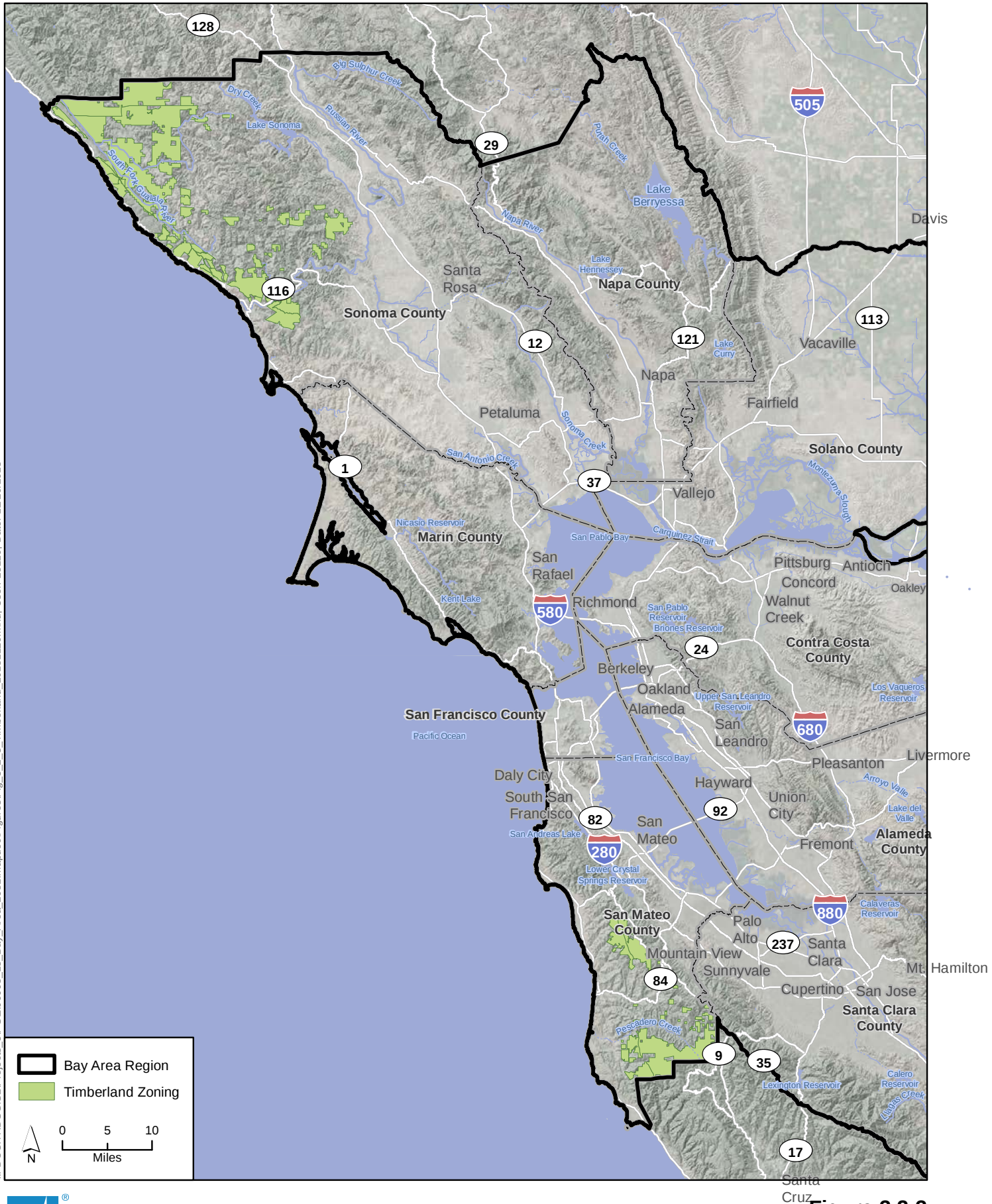


Figure 3.2-3
Forest Land, Timberland and Timberland Production Zones in the Study Area

short term and would not convert farmland to nonagricultural uses. Further, O&M activities would generally affect relatively small areas at a time. Once O&M activities have been completed, disturbed areas would be restored.

Most covered activities associated with O&M of existing facilities and infrastructure would be implemented within existing PG&E-owned properties or rights-of-way (ROWs) and adjacent areas; therefore, no conversion of Important Farmland would result from these activities.

The principal potential for temporarily taking Important Farmland out of agricultural uses relates to facilities upgrades and expansions, and construction of minor new facilities. As stated in Chapter 2, minor new construction includes construction of gas pressure limiting stations, minor electrical substation expansions and underground electric lines, which are adjacent to existing facilities and/or in utility or road ROWs (see G-14, E-14, and E-15). ~~Some new or expanded facilities such as pipelines. Limited sections of pipelines~~ would be underground once construction is complete and would not result in the conversion of Important Farmland. Construction of Aboveground minor new construction of facilities such as limited electric lines are linear facilities that would be located ~~in new adjacent to the existing~~ ROWs, generally following the edges of properties, that can usually continue to be used for agricultural purposes consistent with the electric lines and would not result in a material conversion of Important Farmland.

Substation expansions or gas pressure limiting stations could be constructed on lands owned by PG&E or on lands that require acquisition, potentially on agricultural land. Any such minor new construction on designated agricultural land may result in the conversion of small areas of Important Farmland to nonagricultural use. PG&E estimates that conversion of agricultural land would occur at a rate that averages approximately 1 acre per year throughout the study area over the 30-year term of the ITP, an amount so small that it would not affect agricultural production at any location. Such levels of land conversion are exceptionally minor compared with the total acreage of farmland in the study area.¹ As stated in Table 3.2-1, the study area contains approximately 1,978,640 acres of agricultural land, where about 700,000 acres were harvested croplands or irrigated for crop production and the remaining 1,978,640 acres consist primarily of grazing land. It is anticipated that approximately 30 acres of agricultural land would be lost over the 30-year term of the ITP, which comprises approximately 0.001% of the agricultural land in the study area. Additionally, in siting any new facilities, the company routinely consults with local jurisdictions to avoid or minimize conflicts with existing and planned land uses and may modify the proposed siting or design of new facilities based on such consultation, when feasible.

Additional agricultural land, up to 3 acres, may be converted to support habitat enhancement and management. However, this would primarily affect grazing lands, which, while used for agriculture, are not considered to be Important Farmland. Furthermore, most lands identified for conservation would likely continue to be grazed after acquisition, and the land use would not change.

¹ The California Public Utilities Commission (CPUC) has found less-than-significant impacts from projects up to 10 acres in size in Prime Farmland, which is larger than any planned minor new construction for this project. For example, the CPUC's Initial Study/Mitigated Negative Declaration for the Shepherd Substation Project (A.10-12 003) states: "The amount of Prime Farmland that would be converted to nonagricultural land is less than the significance threshold of 10 acres, which is noted in California Government Code §51222 as the size of a parcel large enough to sustain agricultural use in the case of prime agricultural land. The amount of Farmland of Statewide Importance, Unique Farmland, and non-Prime Williamson Act Lands is also less than the significance threshold of 40-acres as defined in Government Code §51222. The proposed project would, therefore, have a less-than-significant impact through the conversion of approximately 5 acres of Farmland to nonagricultural uses."

In light of the small acreages of conversions anticipated and the ongoing nature of the O&M activities that currently are located within Important Farmland environments, direct and indirect impacts related to conversion of Important Farmland to nonagricultural uses would be less than significant. APM AG-1, which elaborates on PG&E's general practices concerning coordination with farmers and ranchers regarding construction activities, would further reduce less-than-significant impacts related to temporary construction activities.

Issuance of the proposed ITP for PG&E's O&M and minor new construction activities in the Bay Area could result in the limited conversion of agricultural land to nonagricultural use over the 30-year term. However, the estimated loss of 1 acre per year would result in impact to approximately 0.001% of agricultural land in the study area. Furthermore, habitat enhancement lands would still include agricultural use. Therefore, agricultural impacts from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AG-2: Conflict with existing zoning for agricultural use or with a Williamson Act contract (Less-than-Significant Impact)

PG&E's utility projects are not subject to local zoning regulations and, in any event, are considered compatible with all zoning designations, including agricultural uses. Because the project would not conflict with existing zoning, there would be no impact.

Gas and electric facilities are considered a compatible use in agricultural preserves under Section 51238 of the California Government Code, and covered activities are unlikely to require cancellation of Williamson Act contracts. It is possible, however, that some activities such as those related to minor new construction might not be considered a compatible use under the Williamson Act contract. In addition, it is possible, although unlikely, that compensation lands could be identified on lands under Williamson Act contract, and acquiring or designating these lands for habitat enhancement and management could result in the withdrawal of lands from Williamson Act protection if the conservation use were not considered to be a compatible use under the Williamson Act contract. However, because most utility uses would be compatible with Williamson Act contracts, the total area likely to be affected under either of these scenarios would be very small. For example, conversion for the habitat enhancements would include converting grazing land to aquatic uses such as stock ponds, which could benefit grazing uses and provide a source of drinking water for livestock. It is anticipated that less than 10 acres would be removed from Williamson Act protection. In addition, a Williamson Act contract would only be extinguished by the amount of property that PG&E acquires; the contract on the remaining parcel would remain intact.

For these reasons, the project would not conflict with a Williamson Act contract and any impacts would be less than significant.

Issuance of the proposed ITP would not result in the conversion of Williamson Act contracts as agricultural practices would continue on conserved lands and would not conflict with zoning because uses would still be compatible with existing zoning. Therefore, agricultural impacts from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AG-3: Conflict with existing zoning of forest land, timberland, or timberland zoned Timberland Production (Less-than-Significant Impact)

As stated above, PG&E's utility projects are not subject to local zoning regulations and would not conflict with existing zoning. Further, most of the counties in the study area do not contain land

zoned for forest land, timberland, or TPZ. However, Sonoma and San Mateo Counties do contain land zoned for TPZ (Figure 3.2-3). PG&E's covered activities would permanently affect small amounts of land, much of which would be in or adjacent to existing utility easements or other PG&E properties. The vast majority of O&M activities would affect less than 0.1 acre (approximately 66 by 66 feet), and all O&M activities are part of baseline conditions currently occurring throughout the project area. PG&E limits grading to the area necessary to ensure the safe movement of construction equipment in the ROW. Activities such as clearing would take place within PG&E's easement. These activities would be minor and would not result in zoning or land use changes. Therefore, issuance of the proposed ITP for PG&E's O&M and minor new construction for this impact would be less than significant.

Impact AG-4: Loss of forest land or conversion of forest land to non-forest use (Less-than-Significant Impact)

As previously discussed above under Impact AG-3, most of the counties in the study area do not contain land zoned for forest land, timberland, or TPZ. However, Sonoma and San Mateo Counties do contain land zoned for TPZ (Figure 3.2-3). PG&E's covered activities would permanently affect small amounts of land, much of which would be in or adjacent to existing utility easements or other PG&E properties. The vast majority of O&M and minor new construction activities would affect less than 0.1 acre (approximately 66 by 66 feet), and PG&E's O&M activities are currently occurring throughout the project area. PG&E limits grading to the area necessary to ensure the safe movement of construction equipment in the ROW. Activities such as clearing would take place within PG&E's easement. These activities would be minor and would not result in significant loss of forest land. Therefore, issuance of the proposed ITP for PG&E's O&M and minor new construction for this impact would be less than significant. the facilities in the study area do not cross forest land. Therefore, no impact would result.

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 (Less-than-Significant Impact)

Issuance of the ITP for PG&E's covered activities associated with the ITP would not involve authorize any other changes in PG&E operations, new facilities, or extensions in the existing environment that could result in the conversion of farmland to a nonagricultural use or forest land to a non-forest use. Therefore, issuance of the proposed ITP for PG&E's O&M and minor new construction for this impact would be less than significant result a less-than-significant impact on indirect conversion of farmland or forest land.

3.2.3 References Cited

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3.3 Air Quality

3.3.1 Existing Conditions

3.3.1.1 Regulatory Setting

The agencies of direct importance to the proposed project for air quality are the U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB), Bay Area Air Quality Management District (BAAQMD), Northern Sonoma County Air Pollution Control District (NSCAPCD), and the Yolo-Solano Air Quality Management District (YSAQMD). EPA has established federal air quality standards for which CARB and the regional air districts have primary implementation responsibility. This section describes the regulations applicable to air quality management in the study area.

Federal

Clean Air Act

The Clean Air Act (CAA) was first enacted in 1963 and has been amended numerous times in subsequent years (1965, 1967, 1970, 1977, and 1990). The CAA establishes federal air quality standards, known as National Ambient Air Quality Standards (NAAQS), and specifies future dates for achieving compliance. The CAA also mandates that the state submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment of goals and incorporation of additional sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect ongoing operations and maintenance (O&M) activities include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Table 3.3-1 shows the NAAQS currently in effect for each criteria pollutant. The California Ambient Air Quality Standards (CAAQS) (discussed below) are also provided in the table, for reference.

Table 3.3-1. National 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 (PM ₁₀)	24-hour	50 µg/m ³	150 µg/m ³	150 µg/m ³
	Annual mean	20 µg/m ³	None	None
Fine particulate matter (PM _{2.5})	24-hour	None	35 µg/m ³	35 µg/m ³
	Annual mean	12 µg/m ³	12.0 µg/m ³	15.0 µg/m ³
Carbon monoxide	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None

Criteria Pollutant	Average Time	California Standards	National Standards ^a	
			Primary	Secondary
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	0.14 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/m ³	None	None
	Calendar quarter	None	1.5 µg/m ³	1.5 µg/m ³
	3-month average	None	0.15 µg/m ³	0.15 µg/m ³
Sulfates	24-hour	25 µg/m ³	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.

PM10 = particulate matter less than or equal to 10 microns in diameter

PM2.5 = particulate matter less than or equal to 2.5 microns in diameter

µg/m³ = micrograms per cubic meter

ppm = parts per million

^a National standards (NAAQS) 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 sulfur dioxide only apply for 1 year after designation of the new 1-hour standard to those areas that were previously 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%.

State

California Clean Air Act

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

CARB and regional air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, EPA has delegated the 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 California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts the authority to implement transportation control measures. The California CAA also emphasizes the control of “indirect and area-wide sources” of air pollutant emissions. The California CAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures.

Toxic Air Contaminant Regulation

California regulates toxic air contaminants (TACs) primarily through the Toxic Air Contaminant Identification and Control Act of 1983 (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.

In August 1998, CARB identified diesel particulate matter (DPM) from diesel-fueled engines as TACs. In September 2000, CARB 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 (which is respirable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020. The plan identifies 14 measures that CARB will implement over the next several years.

Regional

The air pollution control districts and air quality management districts regulate air quality at the regional level. Air districts have local responsibility in 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 the California Environmental Quality Act (CEQA). The air 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 study area is located in three different air quality management or air pollution control districts. These districts are BAAQMD, NSCAPCD, and YSAQMD. Each of these districts has its own set of air quality thresholds and rules that apply to projects within its jurisdiction, including ongoing O&M activities. Air district rules and analysis guidance are outlined in their respective CEQA handbooks and associated guidance.

3.3.1.2 Environmental Setting

Ambient air quality is generally affected by climatological conditions, the topography of the air basin, the type and amounts of pollutants emitted, and, for some pollutants, sunlight. The study area consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. These nine counties are mostly located in the San Francisco Bay Area Air Basin

(SFBAAB), with parts of Solano County located in the Sacramento Valley Air Basin (SVAB), and parts of Sonoma County located in the North Coast Air Basin (NCAB).

Regional Topography, Meteorology, and Climate

The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays, which can distort wind flow patterns. During the summer, the Pacific high pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. In the winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential. A large-scale gradient (differential) in temperature is often created between the coast and the Central Valley because land tends to heat up and cool off more quickly than water, and small-scale local gradients are often produced along the shorelines of the ocean and bays.

The amount of annual precipitation can vary greatly from one part of the SFBAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys. Winter rains account for about 75% of the average annual rainfall.

The NCAB is located just north of the SFBAAB and is similar in terms of meteorology and climate. In summer, warm ground surfaces draw cool air in from the coast, creating frequent thick fogs along the coast and making northwesterly winds common. In winter, precipitation is high, surface wind directions are highly variable, and weather is more affected by oceanic storm patterns.

The SVAB contains parts of the northeast portion of Solano County. Overall, the topography of the SVAB is very flat, but is bounded by the Coast Ranges on the west and the Sierra Nevada on the east. The portion of the study area in the SVAB is located predominantly within Solano County. Hot, dry summers and mild, rainy winters characterize the Mediterranean climate of the SVAB. During the year, the temperature may range from 20 degrees Fahrenheit (°F) to 115°F with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, and the rainy season generally occurs November through March.

Criteria Air Pollutants

As discussed previously, the federal and state governments have established NAAQS and CAAQS, respectively, for six criteria pollutants: ozone, lead, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and particulate matter (PM), which consists of PM less than or equal to 10 microns in diameter (PM₁₀) and PM less than or equal to 2.5 microns in diameter (PM_{2.5}). Ozone and NO₂ are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO₂, and lead are considered local pollutants that tend to accumulate in the air locally.

The primary criteria pollutants of concern in the study area are ozone (including reactive organic gases [ROGs] and nitrogen oxides [NO_x]), CO, and PM. Principal characteristics of these pollutants are described below.

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. Ozone poses a health threat to those who

already suffer from respiratory diseases as well as to healthy people. Additionally, ozone has been tied to crop damage, typically in the form of stunted growth and premature death. Ozone can also act as a corrosive, resulting in property damage, such as the degradation of rubber products.

Volatile Organic Compounds or Reactive Organic Gases

Volatile organic compounds (VOCs) or ROGs are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicles is the major source of hydrocarbons. Other sources of ROG 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. Adverse effects on human health are not caused directly by ROG but rather by reactions of ROG to form secondary pollutants such as ozone.

Nitrogen Oxides

NO_x serve as integral participants in the process of photochemical smog production. The two major forms of NO_x are nitric oxide (NO) and NO₂. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature or high pressure. NO₂ is a reddish-brown, irritating gas formed by the combination of NO and oxygen. NO_x acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

NO_x forms when fuel is burned at high temperatures. Typical human-made sources of NO_x include motor vehicles; fossil-fueled electricity generation utilities; and other industrial, commercial, and residential sources that burn fuels. NO_x can harm humans by affecting the respiratory system. Small particles can penetrate the sensitive parts of the lungs, cause or worsen respiratory disease, and aggravate existing heart conditions. As discussed previously, ozone is formed when NO_x and ROGs (i.e. hydrocarbons) react with sunlight.

Particulate Matter

PM consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized—inhalable coarse particles, or PM₁₀, and inhalable fine particles, or PM_{2.5}. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading. Both PM₁₀ and PM_{2.5} may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems.

Carbon Monoxide

CO is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation and, in extreme cases, death.

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 a variety of sources: 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) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders.

Existing Air Quality

CARB and the regional air districts maintain a network of monitoring stations that record daily and annual pollutant concentrations. The local monitoring data are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are defined as follows.

- **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.

Table 3.3-2 provides the current NAAQS and CAAQS attainment status for the study area in the three air basins. Most of the study area is currently designated as nonattainment for ozone, PM10, and PM2.5 (state and federal for ozone, state only for PM10 and PM2.5).

Table 3.3-2. Federal and State Attainment Status of the Study Area by Air Basin

Pollutant	SFBAAB	NCAB	SVAB
Federal Standards (NAAQS)			
Ozone	Marginal Nonattainment	Attainment	Severe 15 Nonattainment ^a
CO	Moderate Maintenance ^b	Attainment/Maintenance	Moderate Maintenance ^b
PM2.5	Moderate Nonattainment	Attainment	Moderate Nonattainment
PM10	Attainment	Attainment	Attainment
NO ₂	Attainment	Attainment	Attainment
SO ₂	Attainment	Attainment	Attainment
Lead	Attainment	Attainment	Attainment
State Standards (CAAQS)			
Ozone	Nonattainment	Nonattainment	Nonattainment
CO	Attainment	Attainment/Unclassified	Attainment
PM2.5	Nonattainment	Attainment	Nonattainment
PM10	Nonattainment	Attainment ^b	Nonattainment

Pollutant	SFBAAB	NCAB	SVAB
NO ₂	Attainment	Attainment	Attainment
SO ₂	Attainment	Attainment	Attainment
Lead	Attainment	Attainment	Attainment
Sulfates	Attainment	Attainment	Attainment
H ₂ S	Unclassified	Unclassified	Unclassified
VRP	Unclassified	Unclassified	Unclassified

Sources: U.S. Environmental Protection Agency 2017; California Air Resources Board 2017.

CAAQS = California Ambient Air Quality Standards

CO = carbon monoxide

H₂S = hydrogen sulfide

NAAQS = National Ambient Air Quality Standards

NCAB = North Coast Air Basin

NO₂ = nitrogen dioxide

PM₁₀ = particulate matter less than or equal to 10 microns in diameter

PM_{2.5} = particulate matter less than or equal to 2.5 microns in diameter

SFBAAB = San Francisco Bay Area Air Basin

SO₂ = sulfur dioxide

SVAB = Sacramento Valley Air Basin

VRP = visibility reducing particles

^a Areas classified as severe-15 must attain the NAAQS within 15 years of the effective date of the nonattainment designation

^b Designation applies to a portion of the study area.

Table 3.3-3 shows electricity and gas transmission and distribution facilities by air basin within the study area. The percentage is the length within the selected air basin. The SFBAAB has the vast majority of electricity and gas transmission and distribution facilities within the study area.

Table 3.3-3. Electricity and Gas Facilities by Air Basin

Type	Air Basin	Miles	Percentage
Electric	Lake County	<1	<1%
	North Central Coast	3	<1%
	North Coast	1,563	5%
	Sacramento Valley	1,609	5%
	San Francisco Bay	28,933	90%
	San Joaquin Valley	0	<1%
	<i>Total</i>	<i>32,109</i>	<i>100%</i>
Gas	North Central Coast	<1	<1%
	North Coast	160	1%
	Sacramento Valley	562	3%
	San Francisco Bay	19,891	96%
	<i>Total</i>	<i>20,613</i>	<i>100%</i>

Sensitive Receptors

The NAAQS and CAAQS apply at publicly accessible areas, regardless of whether those areas are populated. For the purposes of air quality analysis, 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 (e.g., 24-hour, 8-hour, and 1-hour). Typical sensitive receptors include residences, hospitals, and schools.

Because O&M activities are ongoing and dispersed throughout the study area, it is not possible to know where the nearest sensitive receptors are located. In rural areas, there may be no sensitive receptors located near construction areas. However, since most of the study area is located within the SFBAAB, which includes numerous densely populated urban areas, it is expected that sensitive receptors would be located within relatively close proximity to some O&M and minor new construction activities.

3.3.2 Environmental Impacts

3.3.2.1 Methods for Analysis

O&M activities would continue to generate traffic and associated vehicle emissions on roads and highways in the study area. Activities that require physical changes or heavy-duty equipment would also generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. Although the majority of covered activities are similar to the ongoing activities currently undertaken and would take place within or immediately adjacent to existing Pacific Gas and Electric Company (PG&E) rights-of-way (ROWs), the precise sizes and locations of individual activities on these lands are not known at this time. In addition, because PG&E has conducted O&M activities in the study area for more than 30 years, ongoing O&M impacts are considered part of the baseline environmental conditions. ~~described in this section represent baseline environmental conditions that would not change following approval of the Incidental Take Permit (ITP).~~ Thus, ~~it~~ it is not possible to identify the specific amount of air quality emissions that would result from the ITP requirements for the covered activities, or where emissions would be generated. Accordingly, air quality impacts are assessed qualitatively based on the expected types, frequency, and intensity of minor new construction and O&M activities, relative to existing conditions. Where applicable, previously published analyses of similar types of PG&E projects are used to identify the ~~baseline environmental~~ conditions and inform the impact analysis and discussion.

The analysis discusses the potential for future individual activities in the study area to generate emissions that exceed regional air district thresholds and, where necessary, minimization measures that are available to reduce those emissions. This document focuses on identifying a strategy to ensure that an appropriate level of air quality protections are provided on a case-by-case basis. The analysis considers PG&E's existing environmental programs and avoidance and minimization measures, as described below.

PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures

PG&E maintains an air quality program that it implements for all O&M projects and minor new construction activities. PG&E educates its staff on air quality and related legal requirements, vehicle

operation restrictions, and best management practices (BMPs) to minimize fugitive dust (see Table 2-3 of this EIR). In addition, BMPs, such as the following examples, are implemented to minimize air pollutant emissions.

- Encourage workers to carpool to the job site to the extent feasible for large jobs. The ability to develop an effective carpool program for the project will depend upon the proximity of carpool facilities to the area, the geographical commute departure points of construction workers, and the extent to which carpooling will not adversely affect worker arrival time and the project's schedule.
- Minimize unnecessary vehicle idling time. The ability to limit vehicle idling time will depend on the sequence of activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive tasks, these vehicles may require more idling time. The crews apply a "common sense" approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously, its engine will be shut off.
- Maintain equipment in proper working conditions in accordance with PG&E standards.
- Minimize equipment exhaust by using low-emission or electric equipment where feasible. Portable diesel-fueled construction equipment with engines 50 horsepower or larger and manufactured in 2000 or later are registered under the CARB Statewide Portable Equipment Registration Program.
- Minimize welding and cutting by using compression of mechanical applications where practical and within standards.
- Encourage use of natural gas or electric powered vehicles for passenger cars and light-duty trucks where feasible and available.
- Encourage the recycling of waste where feasible.

Fugitive dust BMPs are typically designed and implemented to meet the requirements of the applicable air quality management district and typically would include the following or similar practices. The applicant proposed measure (APM) provided below includes the relevant rules within the study area and will be implemented on all projects as appropriate (see Table 2-4 of this EIR).

APM AIR-1: Implement Dust Control Best Management Practices

PG&E will implement control measures to reduce construction-related fugitive dust. The following measures are based on BAAQMD's CEQA guidelines and are in conformance with fugitive dust control recommendations from the NSCAPCD and YSAQMD. Updates may be incorporated as new measures are recommended.

- All exposed surfaces will be watered at a frequency adequate to maintain minimum soil moisture of 12%. Moisture content can be verified by lab samples or moisture probe.
- 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 miles per hour (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.
- All excavation, grading, and/or demolition activities will be suspended when average wind speeds exceed 20 mph.
- 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.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time will be limited. Activities will be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, will be washed off prior to leaving the site.
- 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%.

Significance Criteria

In accordance with Appendix G of the State CEQA Guidelines, the potential significance of impacts on air quality from the proposed project and implementation of covered activities was evaluated for each of the following criteria:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in 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.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

As discussed previously, the study area spans three air districts (BAAQMD, NSCAPCD, and YSAQMD). Table 3.3-4 shows the criteria pollutant thresholds for each of these air districts. The thresholds consider whether a project's emissions would result in a cumulatively considerable adverse contribution to existing air quality conditions. 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 project-level and cumulative impact.

Table 3.3-4. Air District Criteria Pollutant and Precursor Thresholds

Analysis	BAAQMD	NSCAPCD	YSAQMD
Construction	ROG: 54 lbs/day NO _x : 54 lbs/day PM ₁₀ : 82 lbs/day (exhaust only) PM _{2.5} : 54 lbs/day (exhaust only)	ROG: 40 tons/yr NO _x : 40 tons/yr PM ₁₀ : 15 tons/yr PM _{2.5} : 10 tons/yr	ROG: 10 tons/yr NO _x : 10 tons/yr PM ₁₀ : 80 lbs/day

Analysis	BAAQMD	NSCAPCD	YSAQMD
		CO: 100 tons/yr	
Operations	ROG: 54 lbs/day or 10 tons/yr NO _x : 54 lbs/day or 10 tons/yr PM ₁₀ : 82 lbs/day or 15 tons/yr PM _{2.5} : 54 lbs/day or 10 tons/yr CO: Violation of CAAQS	Same as construction	Same as construction (ROG, NO _x , PM ₁₀) CO: Violation of CAAQS
Sources: Bay Area Air Quality Management District 2017; Yolo-Solano Air Quality Management District 2007; Saschin pers. comm. BAAQMD= Bay Area Air Quality Management District CAAQS = California Ambient Air Quality Standards CO = carbon monoxide PM ₁₀ = particulate matter less than or equal to 10 microns in diameter PM _{2.5} = particulate matter less than or equal to 2.5 microns in diameter lbs = pounds NSCAPCD = Northern Sonoma County Air Pollution Control District NO _x = nitrogen oxides ROG = reactive organic gas yr = year YSAQMD = Yolo-Solano Air Quality Management District			

NSCAPCD's and BAAQMD's thresholds are based on the new source review (NSR) offset requirements for stationary sources. BAAQMD has 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 health-protective NAAQS (Bay Area Air Quality Management District 2017).

YSAQMD's ozone precursor thresholds are based on the emissions levels identified under Rule 3.20—Ozone Transport Mitigation, which implements the California Ozone Transport Mitigation Regulation codified under California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 1.5, Article 6, Section 70600(b)(1)(C). The Transport Mitigation Regulation was adopted to ensure that air quality is not significantly degraded by new sources of emissions, inclusive of pollutant transport to downwind air districts. Based on the ozone attainment status of YSAQMD and its location within the broader Sacramento Area, Rule 3.20 requires a 10 tons per year "no net increase" program for NO_x and ROG generated by stationary sources. YSAQMD has concluded that the stationary source restriction established by Rule 3.20 is equally applicable to land use projects. YSAQMD's regional ozone thresholds for attaining the CAAQS and NAAQS were therefore set as the total emission thresholds associated with Rule 3.20 and the California Ozone Transport Mitigation Regulation (Yolo-Solano Air Quality Management District 2007).

YSAQMD's PM₁₀ thresholds are based on the emissions levels identified under the NSR program, which is a permitting program established by Congress as part of the CAA Amendments of 1990 to ensure that air quality is not significantly degraded by new sources of emissions. YSAQMD's NSR program requires best available control technologies (BACT) to be applied where new or modified PM₁₀ emissions exceed 80 pounds per day. Therefore, a project's PM₁₀ emissions that trigger the YSAQMD's BACT threshold for PM₁₀ would result in substantial air emissions and have a potentially significant impact on air quality (Yolo-Solano Air Quality Management District 2007).

As shown in Table 3.3-4, BAAQMD and YSAQMD both consider localized CO concentrations above the CAAQS to be of concern. YSAQMD's (2007) CEQA Handbook specifically states that CO "hotspots

are usually associated with roadways that are congested and have heavy traffic volume.” BAAQMD (2017) has adopted the following screening criteria that provide a conservative presumption of when project-generated traffic would not 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 congestion management plan established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

YSAQMD (2017) has also adopted screening criteria for the analysis of CO concentrations from project-generated traffic. These criteria are based on whether a project would reduce the level of service (LOS) at affected intersections to LOS E or F.

BAAQMD (2017) has also adopted health risk thresholds to evaluate receptor exposure to TAC emissions and localized PM_{2.5} concentrations. Although not formally adopted, YSAQMD (2007) recommends use of the same health risk thresholds, which are the probability of contracting cancer for the maximum exposed individual (MEI) exceeding 10 in 1 million, or the ground-level concentrations of noncarcinogenic TACs resulting in a hazard index (HI) greater than 1 for the MEI.

Although there are no quantitative thresholds applicable to odors, all three air districts have adopted nuisance rules. BAAQMD (2017) considers odors to be a significant public nuisance if five confirmed complaints are received per year (averaged over 3 years) for the same facility.

3.3.2.2 Impact Discussion

As described in Chapter 3.0.2, *Baseline for CEQA Analysis*, PG&E’s ongoing O&M activities are part of the CEQA environmental baseline. Although CDFW’s issuance of the Incidental Take Permit (ITP) would not change the need or overall extent of the work that will be required within the next 30 years on PG&E’s natural gas and electric systems in the Bay Area, it would include requirements for avoiding and minimizing take of the three covered species, which may alter the approach for carrying out O&M and minor new construction activities by shifting disturbance area locations, limiting timing, or implementing physical actions to protect the species and their habitat. The direct and indirect impacts of covered O&M and minor new construction activities that could occur as a result of CDFW issuing the ITP are the focus of the following environmental analysis. The potential environmental impacts are evaluated in the context of the state and federal regulatory framework within which PG&E operates, PG&E’s standard practices, and the implementation of the voluntary applicant avoidance and minimization measures described in Chapter 2, Tables 2-3 and 2-4.

Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plans (Less-than-Significant Impact)

There are several air quality plans that are applicable to the study area given the multijurisdictional nature of the study area and pollutants of concern for these regions. Requirements of the air quality plans are adopted, as applicable, by the governing air quality management district, and are enforced

through district rules and regulations. Covered activities would be conducted in compliance with applicable federal, state, and regional air district requirements.

The mass emissions thresholds developed by BAAQMD, YSAQMD, and NSCAPCD to assess the potential for a project to violate the local air quality standards or contribute to an air quality standard violation correlate to the planned increases in air pollutant emissions that are assumed in the applicable regional air quality plans. Therefore, project-related increases that would exceed the BAAQMD, YSAQMD, and NSCAPCD significance thresholds would be considered to conflict with or obstruct implementation of an applicable air quality plan. If a project's emissions would be less than these thresholds, the project would not be expected to conflict with or obstruct implementation of the applicable air quality plans.

As described under Impact AQ-2, ongoing O&M will continue to generate varying levels of criteria pollutants, depending on the type and duration of activity. Emissions originate from the following sources.

- Vehicles used for employee access to the site, inspections, patrols, and materials delivery.
- Helicopters used for line stringing activities.
- Off-road equipment (e.g., bulldozers) used for minor new construction.
- Painting and asphalt paving.
- Ground-disturbing activities (e.g., grading).

Relative to existing conditions, emissions from O&M activities are expected to decline over the 30-year term of the ITP as PG&E replaces its vehicles and equipment with more efficient, less polluting models. No new permanent emission-generating facilities would be installed as part of O&M activities, and any replacement of existing facilities would be in kind. Accordingly, O&M activities would not result in a net increase of emissions, relative to existing conditions.

Minor new construction activities would result in short-term emissions; however, as discussed under Impact AQ-2, these emissions are not expected to exceed the applicable construction-related thresholds of significance in BAAQMD, YSAQMD, and NSCAPCD rules. Therefore, the covered activities would not conflict with any applicable air quality plans, and this impact would be less than significant. APM AIR-1, which includes the relevant air quality management district rules within the study area, will further reduce less-than-significant impacts.

Issuance of the proposed ITP would not conflict with or obstruct the implementation of applicable air quality plans because it would not substantially change PG&E's work practices. If they occurred, any such impacts from issuance of the ITP for PG&E's O&M and minor new construction would be highly attenuated and less than significant.

Impact AQ-2: Result in 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 (Less-than-Significant Impact)

Covered activities could result in the generation of criteria pollutants from on-road vehicle movement, use of mobile and stationary equipment, painting and asphalt paving, and earthmoving (e.g., grading). These emissions-generating sources may be used during operational activities, maintenance activities, or construction activities, which are each described below. In general, emissions would vary substantially depending on the level of activity, length of the activity, specific

operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content.

Operational activities, which would be a continuation of ongoing activities, typically include inspecting, monitoring, testing, and operating valves, enclosures, switches, and other components. These activities involve utility personnel working at existing facilities for discrete and designated periods of time. In general, most operational activities are minor and temporary, involving few vehicle trips. Relative to existing conditions, emissions are expected to decline over the 30-year term of the ITP as PG&E replaces its vehicles and equipment with more efficient, less polluting models. No new permanent emission-generating facilities would be installed, and any replacement of existing facilities would be in kind.

Maintenance activities include repairing and replacing facilities, structures, and access roads. This work also includes emergency repair and replacement and vegetation management, including tree pruning and removal. Emissions associated with maintenance activities result from vehicle trips and use of heavy-duty equipment when required for facility repair or replacement. Fugitive dust and ROG¹s are also generated during earthmoving or paving, as required. Most maintenance activities are small in scale and short term. Activities requiring the most intensive equipment and vehicle use are pipeline replacement and reconductoring. Emissions from pipeline replacement and reconductoring originate from mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, and land clearing. Pipeline replacement may also involve trenching, which is a source of fugitive dust. Similar to operational activities, maintenance activities would be a continuation of ongoing activities, and emissions would likely decrease relative to existing conditions due to vehicle and equipment replacement.

Minor new construction activities includes construction of gas pressure limiting stations, minor electrical substation expansions and underground electric lines, which are adjacent to existing facilities and/or in utility or road ROWs (see G-14, E-14 and E-15). ~~include installing new gas pressure limiting station, substation expansion, and new lines to extend service to locally approved new residential or commercial customers.~~ As discussed in Chapter 2, *Project Description*, there are limitations on the size and types of activities that count as minor new construction under the ITP. Criteria pollutant emissions would be generated by mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, and land clearing. Activities on linear projects would not take place in one location and most construction activities would be relatively small in scale (e.g., an average of 0.23 acre of permanent disturbance for each new distribution/transmission line project, and an average of 0.29 acre of disturbance for each electric tower line construction project). Likewise, depending on the activity, minor new construction activities would occur no more than two times per year per activity (refer to Table 2-2).

Minor new construction with the greatest likelihood to generate emissions would be ~~new customer~~ limited pipeline installation, new limited distribution and transmission line construction or relocation, electric tower line construction, and minor substation expansion. Based on previous similar projects, emissions from these types of construction activities are not likely to exceed applicable air district thresholds in the BAAQMD, YSAQMD, and NSCAPCD.¹ PG&E would obtain any

¹ For example, ROG and NO_x emissions from electric tower line or new distribution and transmission line construction would be expected to be in the range of less than 0.5 and less than 3 tons per year, respectively, based on modeling from the Cressey-Gallo 115-kV Power Line environmental analysis (which included construction of a 14.4-mile line; ~~as shown in Chapter 2, covered linear activities, like transmission line construction, are limited to 2 miles or less~~). With regard to daily emissions, this would equate to approximately 5 and 39 pounds per day,

applicable permits and, in the unlikely event that an activity exceeds a threshold, would mitigate impacts as required by the regional air district. All construction activities would also be subject to PG&E's air quality program, which would reduce criteria pollutant emissions. Because emissions from minor new construction activities would not exceed applicable thresholds, and because PG&E's air quality program would further reduce emissions, this impact would be less than significant.

Issuance of the proposed ITP would not result in 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 because it would not substantially change PG&E's work practices. Therefore, cumulative air quality impacts from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations (Less-than-Significant Impact)

The primary pollutants of concern with respect to health risks to sensitive receptors are criteria pollutants (regional and local) and TAC. Ozone precursors (ROG and NO_x) and PM are considered regional pollutants because they affect air quality on a regional scale. Localized pollutants 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 criteria pollutants of concern that would be generated by the project are PM (fugitive dust) and CO. The primary TAC of concern is DPM.

Regional Criteria Pollutants

Adverse health effects induced by regional criteria pollutant emissions (ozone precursors and PM) generated by performing the covered activities are highly dependent on a multitude of interconnected variables, including cumulative concentrations, local meteorology and atmospheric conditions, and the number, age and gender of exposed individuals. Because local conditions may spread emissions in unpredictable ways, ozone precursors (ROG and NO_x) emissions 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—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.

As discussed above, the air quality districts in the study area develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. Recognizing that air quality is a cumulative problem, air districts typically consider projects that generate criteria pollutants and ozone precursor emissions below the thresholds to be minor in nature. Such projects would not adversely affect air quality or exceed the NAAQS or CAAQS. As described under Impact AQ-2,

respectively. These annual emissions are below the YSAQMD and NSCAPCD annual emissions thresholds for ROG and NO_x (10 tons/year for YSAQMD, 40 tons/year for NSCAPCD), and daily emissions are below the BAAQMD daily emissions thresholds for ROG and NO_x (54 lbs/day).

implementation of the covered activities is highly unlikely to generate ROG, NO_x, or PM emissions in excess of applicable air district thresholds. As such, the project would not contribute a significant level of air pollution that would degrade long-term, regional air quality.

Localized Criteria Pollutants

During grading and excavation activities required for minor construction activities, 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. BAAQMD's CEQA Air Quality Guidelines consider dust impacts to be less than significant if BAAQMD's construction BMPs are employed to reduce such emissions. Because BAAQMD's Basic Construction Mitigation Measures would be implemented, per APM AIR-1, construction-related fugitive dust emissions would be less than significant and would not expose receptors to substantial pollutant concentrations or risks.

Continuous engine exhaust during project operations 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, such as fatigue, headaches, confusion, dizziness, and chest pain. 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. As discussed in Section 3.17, *Transportation and Traffic*, traffic generated directly by covered activities would be minimal, involving a varying number of personnel driving to and from work areas throughout the day. Depending on the activity, crews would generally consist of two to five workers for O&M activities and 10 to 20 workers for minor new construction activities. Traffic for habitat management and enhancement activities would be similar. The limited number of vehicle trips generated by crew members traveling and hauling equipment to and from work areas would neither substantially worsen delay at existing intersections nor exceed BAAQMD's volume-based screening criteria of 44,000 vehicles per hour. Therefore, the project would not expose sensitive receptors to substantial CO concentrations.

Diesel Particulate Matter

Covered activities would be implemented in rural, urban, and suburban areas, including some areas of residential development. Although most of the covered activities would take place within PG&E ROWs, residential properties are located close to PG&E ROWs in many areas throughout the study area. Covered activities would predominantly be short term and temporary. No new permanent criteria pollutant-generating facilities would be installed, and any replacement of existing facilities would be in kind, likely resulting in an emissions reduction attributable to improvements in technology. Emissions from O&M activities are likewise expected to decline, relative to existing conditions, due to implementation of PG&E's air quality program. Accordingly, health risks from exposure to emissions from O&M activities are anticipated to be similar to existing conditions, and may decrease, over the 30-year term of the ITP.

Minor new construction activities could result in the generation of short-term diesel exhaust emissions from the use of helicopters (if required), onsite heavy-duty equipment, and offsite vehicles required for materials deliveries and debris hauling. Particulate exhaust emissions from diesel-fueled engines (DPM) were identified as a TAC by CARB in 1998. The dose to which receptors are exposed is the primary factor affecting health risk from TACs. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the

substance or substances. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 30-year exposure period when assessing TACs (such as DPM) that have only cancer or chronic noncancer health effects (Office of Environmental Health Hazard Assessment 2015). However, such health risk assessments should be limited to the duration of the emission-producing activities.

Emission-generating activities required for minor new construction would be relatively small and short term and would be spread out throughout the nine-county study area. For example, construction activities at individual utility poles along a transmission alignment would require no more than 1 to 2 days. Consequently, individual receptors would not be exposed to elevated levels of DPM for an extended period. In addition, PG&E has committed to implementing many BMPs (described under *PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures*) that would reduce overall emissions from construction activities. The use of BMPs, including those to reduce construction vehicle and equipment exhaust emissions, and the use of hybrid electric and fuel cell vehicles as part of PG&E's clean fleet program would reduce the likelihood that receptors would be exposed to substantial pollutant concentrations. In addition, because health risks associated with DPM are generally associated with chronic exposure and are assessed over a 30-year exposure period, emissions from minor new construction activities would have a limited potential to affect sensitive receptors. Therefore, the covered activities would result in a less-than-significant impact on nearby sensitive receptors.

Issuance of the proposed ITP would not expose sensitive receptors to substantial pollutant concentrations because it would not substantially change PG&E's work practices. Therefore, air quality impacts on sensitive receptors from issuance of the ITP for PG&E's O&M and minor new construction would be less than significant.

Impact AQ-4: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (Less-than-Significant Impact)

Covered activities would generate mobile source emissions (e.g., from vehicles and the use of diesel equipment), which could result in the creation of objectionable odors. Such odors are temporary and generally not at magnitudes that affect substantial numbers of people. Further, covered activities would be spatially dispersed throughout the nine-county study area. Therefore, odors from these activities are not expected to affect a substantial number of people, and odors impacts would be less than significant.

Issuance of the proposed ITP would not result in other emissions adversely affecting a substantial number of people because it would not substantially change PG&E's work practices. A substantial number of people are generally not expected to be located in areas where take authorization is provided. Therefore, other emissions adversely affecting a substantial number of people are not expected to occur from issuance of the ITP for PG&E's O&M and minor new construction and impacts would be less than significant.

3.3.3 References Cited

3.3.3.1 Printed References

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3.3.3.2 Personal Communications

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3.4 Biological Resources

3.4.1 Existing Conditions

3.4.1.1 Regulatory Setting

Federal

Federal Endangered Species Act

The federal Endangered Species Act (FESA) protects plants and wildlife that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS). FESA prohibits take of endangered wildlife, where "take" is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (16 United States Code [USC] Sections 1532[19], 1538). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 USC Section 1538[c]).

Under Section 7 of the FESA, federal agencies are required to consult with the USFWS or NMFS if their actions, including permit approvals or funding, could adversely affect a listed species (including plants) or its critical habitat. Through consultation and the issuance of a Biological Opinion, USFWS and NMFS may issue an incidental take statement, allowing take of the species that is incidental to another authorized activity, provided that the action would not jeopardize the continued existence of the species. Section 10 of the FESA provides for issuance of Incidental Take Permits (ITP) to private parties with the development of a Habitat Conservation Plan (HCP).

Bald and Golden Eagle Protection Act

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are federally protected under the Bald and Golden Eagle Protection Act (BGEPA), which was passed in 1940 to protect the bald eagle and amended in 1962 to include the golden eagle (16 USC Section 668a-d). The BGEPA prohibits the take, possession, sale, purchase, barter, offering to sell or purchase, export or import, or transport of bald eagles and golden eagles and their parts, eggs, or nests without a permit issued by the USFWS. The definition of "take" includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. The BGEPA prohibits any form of possession or take of either eagle species, and imposes criminal and civil sanctions, as well as an enhanced penalty provision for subsequent offenses. Further, the BGEPA provides for the forfeiture of anything used to acquire eagles in violation of the statute. Regarding its prohibitions on possession, the statute exempts the use of eagles or eagle parts for exhibition, scientific, and Native American religious uses.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) protects migratory birds and any of their parts, eggs, and nests from activities such as intentionally hunting, pursuing, capturing, killing, selling, and shipping,

unless expressly authorized in the regulations or by permit. As authorized by the MBTA, USFWS issues permits to qualified applicants for the following types of activities.

- Falconry.
- Raptor propagation.
- Scientific collecting.
- Special purposes such as rehabilitation, education, migratory game bird propagation, and salvage.
- Take of depredating birds, taxidermy, and waterfowl sale and disposal.

The regulations governing migratory bird permits can be found in Title 50, Part 13 (General Permit Procedures) and Part 21 (Migratory Bird Permits) of the Code of Federal Regulations, which authorizes the issuance of permits for utility-related activities related to migratory birds, which are otherwise outside the scope of other migratory bird permits.

Clean Water Act

Section 404

The purpose of the Clean Water Act (CWA) is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Section 404 of the CWA prohibits the discharge of dredge or fill material into waters of the United States without a permit from the U.S. Army Corps of Engineers (USACE). Under the current USACE-administered Nationwide Permit program, “activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities” may be authorized under Nationwide Permit 12 (Utility Line Activities) if the activity does not result in a loss of more than 0.5 acre of waters of the United States “for each single and complete project.” Permanent impacts on waters of the United States that exceed 0.5 acre may require an Individual Permit. The study area is under the jurisdiction of the San Francisco and Sacramento Districts of USACE.

Section 401

Section 401 of the CWA requires that any discharge allowed under a federal permit or license must be certified by the state, confirming that the discharge would not violate water quality standards. Any Section 404 permit issued by USACE must also receive a Section 401 water quality certification or waiver from the relevant Regional Water Quality Control Board (RWQCB). The study area is under the jurisdiction of the San Francisco Bay, North Coast, and Central Valley RWQCBs.

State

California Fish and Game Code

Sections 1600 through 1616

Sections 1600 through 1616 of the California Fish and Game Code require that a notification must be submitted to the California Department of Fish and Wildlife (CDFW) for “any activity that may substantially divert or obstruct the natural flow of, or substantially change or use materials from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste or other

material where it may pass into any river, stream, or lake.” CDFW reviews the notification package and determines whether it is, if necessary, to submits to the applicant a Draft Lake or Streambed Alteration Agreement (LSAA) that includes measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the applicant is an LSAA.

Sections 3503, 3503.5, 3513, and 3800

Sections 3503, 3503.5, 3513, and 3800 of the California Fish and Game Code afford protection over the destruction of nests or eggs of native bird species, and it states that no birds in the orders of Falconiformes or Strigiformes (i.e., birds of prey) can be taken, possessed, or destroyed.

Sections 3511, 4700, 5050, and 5515

Fully Protected Species

The State of California first began to designate species as “fully protected” prior to the creation of the California Endangered Species Act (CESA) and the ESA. Lists of fully protected species initially were developed to provide protection to those animals that were rare or faced possible extinction, and included fish, mammals, amphibians, reptiles, and birds. Many fully protected species have since been listed as threatened or endangered under the CESA and/or the ESA. The fully protected species statutes (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], and 5515 [fish]) provide that fully protected species may not be taken or possessed at any time. CDFW may authorize take of fully protected species only in very limited circumstances, such as for necessary scientific research, or if the take is covered under a Natural Community Conservation Plan (Section 2835). A number of species—including the white-tailed kite, a fully protected bird species—may be present in the Permit Area.

Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code designate certain species as “fully protected.” Fully protected species may not be taken or possessed, and incidental take of these species cannot be authorized, except under a Natural Community Conservation Plan (NCCP). The State of California first began to designate species as fully protected prior to the creation of the California Endangered Species Act (CESA) and the FESA. Lists of fully protected species were initially developed to provide protection to animals that were rare or faced possible extinction, including fish, amphibians, reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the CESA or the FESA. Fully protected species may not be taken or possessed at any time, except under certain circumstances, such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock (California Fish and Game Code Section 3511).

California Endangered Species Act

The CESA (California Fish and Game Code Section 2050 et seq.) was originally enacted in 1970, repealed and replaced by an updated version in 1984, and amended in 1997. It -and- generally parallels most of the main provisions of the FESA. Section 2080 of the California Fish and Game Code prohibits the take, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. *Take* is defined in Section 86 of the California Fish and Game Code as ~~to~~ “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Pursuant to Section 2081(b) of the California Fish

and Game Code, the department may authorize, by permit, the take of endangered, threatened, and candidate species if the take is incidental to otherwise lawful activity. The impacts of the authorized take must be minimized and fully mitigated and issuance of the permit must not jeopardize continued existence of the species.

Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (California Fish and Game Code Sections 1900–1913) directed CDFW to carry out the Legislature’s intent to “preserve, protect, and enhance rare and endangered plants in this state.” The NPPA is administered by CDFW. The California Fish and Game Commission has the authority to designate native plants as “endangered” or “rare,” and to protect endangered and rare plants from take. When the CESA was passed in 1984, it expanded on the original NPPA, enhanced legal protection for plants, and created the categories of “threatened” and “endangered” species to parallel the FESA.

CDFW, jointly with the California Native Plant Society (CNPS), assigns a California Rare Plant Rank (CRPR) to plants considered rare, threatened, or endangered in California. Plants constituting CRPRs 1A, 1B, 2A, and 2B that generally meet the criteria of a CESA listed species and are included in the *Inventory of Rare and Endangered Plants of California* should be considered endangered, rare, or threatened species for the purposes of CEQA analysis; i.e., impacts on species from these classifications should be analyzed and, if necessary, mitigated to the same extent that CESA listed species would be. CDFW generally considers plant species to be rare if they are included on California Rare Plant Rank (CRPR) Lists 1A, 1B, 2A, and 2B of the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Plants of California*. In addition, CRPR List 3 and 4 plants are sometimes considered in an impact analysis if the population has local significance in the area and would be impacted by a project. CRPR List 1 through 4 plants are included in this environmental impact report (EIR). ~~Section 1913(b) includes a specific provision to allow for the incidental removal of endangered or rare plant species, if not otherwise salvaged by CDFW, within a right-of-way (ROW) to allow a public utility to fulfill its obligation to provide service to the public.~~

Natural Community Conservation Planning Act

The Natural Community Conservation Planning Act of 1991 is designed to conserve natural communities at the ecosystem scale within California while accommodating compatible land uses. Section 2800 of the California Fish and Game Code implements a collaborative program by the state and numerous public and private partners to take a broad ecosystem-approach to planning for the protection and perpetuation of biological diversity. NCCPs are the result of an effort to move away from specific species protections and implement community-wide protection measures.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967 (California Water Code Section 13000 et seq.) requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect waters of the state. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. Individual water quality control plans are prepared for each RWQCB. These plans set implementation policies, goals, and water management practices in accordance with the Porter-Cologne Water Quality

Control Act. Waste discharge requirements and waivers are mechanisms used by the RWQCBs to control discharges and protect water quality.

McAteer-Petris Act

The McAteer-Petris Act of 1965 (Government Code Section 66000 et seq.), as amended, directs the San Francisco Bay Conservation and Development Commission (BCDC) to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of both the McAteer-Petris Act and the San Francisco Bay Plan. BCDC jurisdiction consists of the San Francisco Bay (all areas subject to tidal action), a 100-foot-wide band along the bay shoreline, salt ponds diked off from the bay, managed wetlands that have been diked off from the bay, and certain waterways. State law requires that project sponsors proposing to fill or extract materials from San Francisco Bay apply for a BCDC permit, which addresses review by a variety of local agencies, as well as San Francisco Bay RWQCB, USACE, and CDFW.

Local

Although the Pacific Gas & Electric Company's (PG&E) project is not subject to local discretionary land use regulations and ordinances, the following overview of local regulations relating to biological resources is provided for information purposes and to assist with California Environmental Quality Act (CEQA) review.

Suisun Marsh Protection Plan

The Suisun Marsh Protection Plan allows Solano County to manage approximately 89,000 acres of tidal marsh, managed wetlands, adjacent grasslands, and waterways. BCDC now has jurisdiction over most of these acres and a secondary management area of approximately 22,500 acres of significant buffer lands. This plan provides Solano County, under specific guidelines, the authority to prepare and administer a local protection program. BCDC represents the state's interest, serving as the land use permitting agency for major projects in the primary management area and as an appellate body with limited functions in the secondary management area.

Habitat Conservation Plans

East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan

The *East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan* is overseen by the East Contra Costa County Habitat Conservancy (East Contra Costa County Habitat Conservation Plan Association 2006). The plan covers the eastern one-third of Contra Costa County (174,018 acres) and provides Contra Costa County, the Contra Costa County Flood Control and Water District, the East Bay Regional Park District, and the cities of Brentwood, Clayton, Oakley, and Pittsburg with 30-year permits from the USFWS and CDFW that authorize incidental take of covered species. The plan focuses on comprehensive species, wetlands, and ecosystem conservation, and contributes to the recovery of endangered species in California, while allowing for limited take of 28 listed and nonlisted (covered) species.

Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan

The *Santa Clara Valley Habitat Conservation Plan* is overseen by the Santa Clara Valley Habitat Agency (City of Gilroy et al. 2012). The plan covers approximately 508,699 acres and provides the City of San Jose, Santa Clara County, Santa Clara Valley Transportation Authority, Santa Clara Valley Water District, City of Gilroy, and City of Morgan Hill with 50-year permits from the USFWS and CDFW that authorize incidental take of covered species. The plans focus on comprehensive species, wetlands, and ecosystem conservation, and contributes to the recovery of endangered species in California, while allowing for limited take of 18 listed and nonlisted (covered) species.

Solano Habitat Conservation Plan

The *Solano Habitat Conservation Plan* (Solano County Water Agency 2012) will facilitate conservation of approximately 36 federally listed, state-listed and special-status species in Solano and Yolo Counties for activities associated with urban development, flood control and irrigation projects. The date of finalization of this HCP is unknown as of February 2022, not expected until 2021.

San Bruno Mountain Area Habitat Conservation Plan

The *San Bruno Mountain Area Habitat Conservation Plan* was prepared to conserve habitat for four federally protected butterfly species and to conserve the ecosystem of San Bruno Mountain in San Mateo County. This HCP is managed by the County of San Mateo Parks Department, and activities that could affect butterflies or habitat require approval prior to commencement (San Bruno Mountain Habitat Conservation Plan Steering Committee 1982).

PG&E Bay Area O&M HCP

PG&E's *Bay Area Operations and Maintenance Habitat Conservation Plan* (Bay Area O&M HCP) authorizes incidental take of 13 federally listed plant species and 18 wildlife species for routine utility operations and maintenance (O&M) activities at PG&E facilities throughout Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties (Pacific Gas and Electric Company 2017a). The O&M activities addressed in the Bay Area O&M HCP are the same activities as described in Chapter 2, *Project Description*.

Conservation Strategies

East Alameda County Conservation Strategy

The *East Alameda County Conservation Strategy* (EACCS) is a collaborative conservation strategy aimed at preserving endangered species by developing and adopting guidelines to assist in their long-term protection. The EACCS was developed by federal, state, and local entities to provide a framework for the long-term conservation and management of 19 focal species, and nine state and/or federal species and the habitats that support them. The EACCS is also intended to streamline and improve the environmental permitting process for impacts resulting from local land use, transportation, or other infrastructure proposed projects (East Alameda County Conservation Strategy Steering Committee 2010).

The conservation strategy covers the cities of Dublin, Pleasanton, and Livermore, as well as unincorporated areas of eastern Alameda County. The plan's focus is on annual grassland, seasonal and permanent wetlands, riparian woodland, oak woodland, and scrub communities that are known to support several listed or sensitive wildlife species (East Alameda County Conservation Strategy Steering Committee 2010). As a result of formal consultation with USACE, a programmatic Biological Opinion for this conservation strategy was prepared by USFWS and published May 31, 2012.

Santa Rosa Plain Conservation Strategy

The *Santa Rosa Plain Conservation Strategy* is a collaborative conservation strategy aimed at creating a long-term program to mitigate potential adverse effects on listed species due to future development on the Santa Rosa Plain and to preserve and enhance populations and habitat of the listed species (U.S. Fish and Wildlife Service 2005). The Santa Rosa Plain and adjacent areas are characterized by vernal pools, seasonal wetlands, and associated grassland habitat, which supports several species of plants and wildlife listed as threatened or endangered. The strategy area is located in central Sonoma County, bordered on the south and west by the Laguna de Santa Rosa, on the east by the foothills, and on the north by the Russian River. As a result of formal consultation with USACE, a programmatic Biological Opinion was originally published by USFWS for this strategy in 1998 and superseded on November 9, 2007.

3.4.1.2 Environmental Setting

Physical Setting

PG&E implements O&M and minor new construction activities in an area that encompasses PG&E's gas and electric transmission and distribution infrastructure in the San Francisco Bay Area (Bay Area) counties of Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco (Figure 2-1). This area is referred to as the *Permit Area* in this EIR. The PG&E utility infrastructure in the Bay Area includes gas and electric transmission and distribution facilities, ROWs, lands owned by PG&E or subject to PG&E easements to maintain these facilities, private access routes associated with PG&E's routine maintenance, and mitigation lands acquired to mitigate impacts on natural resources, covered by appropriate permits.

Based on species-specific habitat models created by PG&E with input from CDFW and USFWS, the estimated acreage of habitat for the three ITP-covered species, where the ITP conditions would apply, is substantially smaller than the 402,440-acre Permit Area:

- California tiger salamander habitat—approximately 43,500 acres
- Alameda whipsnake habitat—approximately 10,800 acres
- California freshwater shrimp habitat—approximately 100 acres

The study area for this EIR consists of all nine Bay Area counties and encompasses all, or portions of, approximately 158 U.S. Geological Survey topographic quadrangles. Utility infrastructure crosses federal, state, private, and municipal lands.

General climate conditions in the study area are typical of a Mediterranean climate characterized by summer fog along the coast and East Bay, cool summers between coastal areas and Coast Ranges, and hot summers east of the Coast Ranges (California Department of Fish and Game 2003).

Precipitation in the study area falls mostly as rain during the late fall, winter, and early spring months and averages approximately 16 to 32 inches per year, with northern counties generally receiving more rainfall than southern counties. Higher elevations can receive infrequent snowfalls during the winter months, with snow sometimes lasting for 2 to 3 days on Mount Diablo and Mount St. Helena.

The climate in the study area is influenced strongly by its location and topography. In the summer, a steady marine wind blows through the Golden Gate and up the Carquinez Strait. The eastern part of the study area is not influenced by this marine air to the same extent as the western part. Consequently, temperatures in the eastern part of the study area are generally warmer than those in the western part during the summer. During the winter, temperatures in the western part of the study area are generally warmer than those in the eastern part of the study area, owing to the tempering influence of the ocean and bay in the west.

Plant Communities and Land Cover Types

The utility infrastructure and ROWs in the Permit Area encompass approximately 402,440 acres; 128,735 acres (32%) are in natural land cover types (discussed below), 246,777 acres (61%) are in urban areas, and 26,928 acres (7%) are in agricultural areas. The extent of mapped land cover types in the Permit Area is shown in detail in Table 3.4-1. The primary communities represented include forest, grassland, riparian, shrubland, wetland, agriculture, and urban (Pacific Gas and Electric Company 2017a).

Forest

Woodlands and hardwood forests in the Bay Area are represented by a diversity of habitat structures and characteristic species. Coastal oak woodlands are the most prevalent forest habitat type with 3% cover. Coastal oak woodlands range from a closed canopy in mesic sites to open woodlands in drier sites, with understory species ranging from sparse to dense coverage of shrubs and herbs. Coastal oak woodlands are dominated by coast live oak (*Quercus agrifolia*) near the coast. In mesic coastal oak woodlands, the co- or sub-dominant species of coast live oak include: California bay (*Umbellularia californica*), madrone (*Arbutus menziesii*), tanbark oak (*Notholithocarpus densifolia*), and canyon live oak (*Quercus chrysolepis*). In drier coastal oak woodlands, coast live oak intergrades with valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), and foothill pine (*Pinus sabiniana*). Montane hardwoods are the second most prevalent forest habitat type with 2.5% cover. Montane hardwoods have a sparse shrub layer and are dominated by canyon live oak, with a small constituent of foothill pine, knobcone pine (*Pinus attenuata*) and madrone. Montane hardwoods border mixed conifer, montane hardwood-conifer, and mixed-chaparral habitat types. Blue oak woodland provides the third greatest forest cover (0.7%) in the study area; blue oak woodlands are dominated by blue oak, with patches of coast live oak, interior live oak (*Quercus wislizeni*), valley oak, and at higher elevations, foothill pine.

Grasslands

Grasslands in the region are primarily composed of nonnative annual grasslands and cover approximately 14% of the study area. The nonnative annual grassland is an assemblage of Mediterranean annuals that have largely invaded the California grasslands and replaced much of the native plant cover. Common annual grass species include wild oats (*Avena* sp.), brome grasses

(*Bromus* sp.), barleys (*Hordeum* sp.), and annual fescues (*Festuca* sp.). Common herbs include introduced annuals such as filarees (*Erodium* sp.) and clovers (*Trifolium* sp.), and native species such as fiddleneck (*Amsinckia* sp.), lupines (*Lupinus* sp.), and owl's-clover (*Castilleja* sp.). These species germinate after the late fall and winter rains; and they grow, flower, and set seed through spring. Most die in the summer season.

Riparian

Riparian land cover types are typified by at least an ephemeral passage of water. Two riparian land cover types are known in the study area: montane riparian (0.3%) and valley foothill riparian (0.24%). Within the Coast Ranges, montane riparian habitat occurs as a narrow band of deciduous broadleaved trees along seeps, streams, and rivers. In montane riparian habitat, Fremont cottonwood (*Populus fremontii*) is the dominant species with other prevalent trees including willows (*Salix* sp.), big leaf maple (*Acer palmatum*), and California bay. At lower elevations in the central valley and foothills, valley foothill riparian habitats are commonly occupied by Fremont cottonwood, California sycamore (*Platanus racemosa*), and valley oak.

Shrubland

Scrub and chaparral habitats are inhabited by common shrub genera with species representation varying by substrate, climate, and geographical location. Within shrublands, scrub and chaparral land cover types are drought tolerant and adapted to more frequent fire than other habitats. Some scrub and chaparral communities commonly have a dense canopy, whereas other communities have intermittently spaced shrubs. The prevalent genera of scrub and chaparral include manzanita (*Arctostaphylos* sp.), chamise (*Adenostoma fasciculatum*), scrubby oaks (*Quercus* sp.) and California lilac (*Ceanothus* sp.). Mixed chaparral and coastal scrub are the most extensive shrubland cover types in the study area. At 0.43% cover, mixed chaparral typically contains dense shrub canopy cover with a high beta diversity (diversity between locations) of manzanita and California lilac species. Also, at approximately 0.43% cover, coastal scrub consists of low to moderate sized shrubs primarily inhabiting the California coastline and into Mount Diablo. Common woody species witnessed in the different coastal scrub habitats include coyote brush (*Baccharis pilularis* ssp. *pilularis*), bush lupines (*Lupinus* sp.), California lilac, coffeeberry (*Frangula californica*), poison oak (*Toxicodendron diversilobum*), and bush monkey flower (*Mimulus aurantiacus*).

Wetland

The wetland land cover types are inhabited by vegetation communities adapted to prolonged periods of inundation. Managed marshes (0.24%) are the most extensive wetland land cover type in the study area and are managed to provide habitat for wildlife species and associated recreation. In managed marshes, both the vegetation and hydrology (depth and hydroperiod) are controlled. A similarly prevalent wetland habitat type (0.2%), lacustrine habitats contain standing water in topographic depressions or dammed riverine channels. Common lacustrine habitats include permanently and intermittently flooded lakes, ponds, and seasonal wetlands. Commonly observed wetland vegetation includes cattails (*Typha* sp.), sedges (*Carex* sp.), oat grasses (*Danthonia* sp.), rushes (*Juncus* sp.), bulrushes (*Schoenoplectus* sp.), duckweed (*Lemna* sp.), and some willows. More brackish areas will have a dominance of salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and pickleweed (*Sarcocornia pacifica*).

Urban Land Cover

Urban land cover types are currently or were previously utilized for society's benefit. These land cover types predominately include urban, agriculture, and barren habitats. Urban land covers 61% of the study area and was developed for commercial, utility, and residential use. Agriculture includes vineyards, orchards, and other crops and covers 6.9% of the study area. Barren habitat accounts for 1.2% of the study area and is typified by little to no vegetation cover due to soil compaction, frequent disturbance, or other conditions that preclude establishment and growth of vegetation. Barren habitat can be naturally occurring on rock faces or associated with previously disturbed locations.

Table 3.4-1. Mapped Extent of Land Cover Types in Permit Area

	Electricity Distribution (acres)	Electricity Transmission (acres)	Gas Distribution (acres)	Gas Transmission (acres)	Total (acres) ^c	Percent of Total
Natural Lands^a						
Forest						
Blue Oak Woodland	1,150	1,253	230	104	2,737	0.73%
Blue Oak-Foothill Pine	179	97	2	7	286	0.08%
Closed-Cone Pine-Cypress	269	217	1	0	487	0.13%
Coastal Oak Woodland	4,580	4,213	2,413	782	11,988	3.18%
Douglas Fir	779	336	85	42	1,242	0.33%
Eucalyptus	453	148	286	92	979	0.26%
Montane Hardwood	5,192	2,559	1,094	408	9,253	2.46%
Montane Hardwood-Conifer	1,690	681	285	60	2,716	0.72%
Ponderosa Pine	27	1	13	0	41	0.01%
Redwood	1,796	501	93	28	2,417	0.64%
Sierran Mixed Conifer	66	33	6	0	105	0.03%
Unknown Conifer Type	22	67	0	0	89	0.02%
Valley Oak Woodland	452	170	213	155	991	0.26%
Subtotal	16,655	10,276	4,721	1,678	33,331	8.85%
Grassland						
Annual Grassland	18,447	18,312	5,804	10,447	53,011	14.06%
Serpentine Grassland	352	714	132	707	1,905	0.51%
Pasture	3,824	3,182	444	3,148	10,598	2.81%
Perennial Grassland	26	12	0	8	46	0.01%
Subtotal	22,649	22,220	6,380	14,310	65,560	17.40%
Riparian						
Montane Riparian	594	85	352	100	1,131	0.30%
Valley Foothill Riparian	421	176	193	128	918	0.24%
Willow Grove (Sausal)	1	0	0	0	1	0.00%
Subtotal	1,016	261	545	228	2,050	0.54%

	Electricity Distribution (acres)	Electricity Transmission (acres)	Gas Distribution (acres)	Gas Transmission (acres)	Total (acres) ^c	Percent of Total
Shrubland						
Alkali Desert Scrub	3	29	0	18	50	0.01%
Chamise-Redshank Chaparral	420	697	77	106	1,299	0.34%
Coastal Scrub	702	615	94	244	1,656	0.44%
Mixed Chaparral	813	760	53	1	1,627	0.43%
Montane Chaparral	0	0	0	0	0	0.00%
Unknown Shrub Type	93	55	16	36	200	0.05%
Subtotal	2,031	2,156	240	405	4,832	1.28%
Wetland						
Active Salt Pond	69	558	0	0	627	0.17%
Crystallizer	15	7	1	0	23	0.01%
Diked Marsh	127	470	26	168	791	0.21%
Estuarine	5	1	0	0	7	0.00%
Farmed Bayland	270	473	47	92	882	0.23%
Freshwater Emergent Wetland	64	107	8	86	265	0.07%
Grazed Bayland	57	98	3	119	278	0.07%
High Elevation Tidal Marsh	122	560	15	45	743	0.20%
Inactive Salt Pond	22	134	0	0	156	0.04%
Lacustrine	296	285	66	110	758	0.20%
Lagoon	56	42	13	7	117	0.03%
Low/Mid Elevation Tidal Marsh	14	210	0	2	227	0.06%
Major Channel	39	100	2	26	168	0.04%
Managed Marsh	365	205	10	331	911	0.24%
Marine	6	0	0	0	6	0.00%
Muted Tidal Marsh	23	97	3	9	132	0.03%
Perennial Lake or Pond	1	0	0	0	2	0.00%
Riverine	100	131	11	120	362	0.10%
Saline Emergent Wetland	89	101	26	45	262	0.07%
Tidal Flat	55	243	10	4	312	0.08%
Water	8	6	0	0	15	0.00%
Wet Meadow	2	0	0	2	4	0.00%
Subtotal	1,805	3,828	241	1,166	7,048	1.87%
Dune						
Dune	0	0	16	0	16	0.00%

	Electricity Distribution (acres)	Electricity Transmission (acres)	Gas Distribution (acres)	Gas Transmission (acres)	Total (acres) ^c	Percent of Total
Barren/Ruderal						
Barren	1,569	983	767	1,163	4,482	1.19%
Ruderal	45	67	21	31	164	0.04%
Subtotal	1,614	1,050	788	1,194	4,646	1.23%
<i>Natural Lands Subtotal</i>	<i>45,774</i>	<i>39,795</i>	<i>12,930</i>	<i>18,980</i>	<i>117,480</i>	<i>31.18%</i>
Agriculture						
Agriculture	1,667	332	702	499	3,201	0.85%
Cropland	7,281	2,255	1,338	2,500	13,374	3.55%
Deciduous Orchard	591	286	75	171	1,123	0.30%
Evergreen Orchard	5	3	1	2	11	0.00%
Irrigated Grain Crops	2	4	0	8	13	0.00%
Irrigated Row and Field Crops	2,182	1,549	167	1,599	5,497	1.46%
Rice	14	1	0	0	14	0.00%
Vineyard	1,474	583	138	396	2,592	0.69%
Subtotal	13,216	5,013	2,422	5,174	25,825	6.85%
Urban						
Storage or treatment basin	31	86	1	38	156	0.04%
Urban	95,584	16,743	96,008	24,994	233,329	61.93%
Subtotal	95,615	16,829	96,009	25,032	233,485	61.97%
Total ^{b, c}	154,606	61,637	111,361	49,186	376,789	100.00%

Sources: Land cover types were derived from USDA Forest Service 2000 and 2007 Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) geodatabase (USDA Forest Service 2000 and 2007); California Department of Forestry and Fire Protection 2002 Multi-Source Land-Cover Data, (v02_2); and San Francisco Estuary Institute 1996 Modern Baylands EcoAtlas data.

^a Some land cover types are present in the study area but not in the Permit Area (e.g., juniper).

^b Total acreage does not include unmapped facilities (estimated at approximately 17,000 acres), new facilities (estimated at approximately 3,800 acres), or mitigation lands (approximately 5,000 acres) and, therefore, does not match Chapter 2, *Project Description*. Unmapped facilities are expected to be located ~~in~~ at roughly proportional levels to the land cover type for mapped facilities; new facilities are expected to be located predominantly in natural lands; and mitigation lands are expected to be located in natural lands.

^c Numbers may not equal totals due to rounding.

Sensitive Natural Communities

CDFW, in cooperation with CNPS, develops and maintains lists of natural vegetation communities that are rare or considered vulnerable to loss (as a requirement of California Fish and Game Code Section 1940). All sensitive natural communities are identified in the *List of Vegetation Alliances and Associations* (California Department of Fish and Wildlife 2010).

A natural community intersecting the Permit Area was considered to be sensitive if accompanied by a state rarity ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable). All wetland and riparian habitats are considered sensitive natural communities. The sensitive natural communities

present in the Permit Area are listed in Table 3.4-2, along with natural community sensitivity ranking detail.

Table 3.4-2. Sensitive Natural Communities in the Permit Area

Natural Community	State Rank ^a	Natural Community in California (acres)	Natural Community in Permit Area (acres)
Northern Claypan Vernal Pool	S1.1	19,652	791.5
Sycamore Alluvial Woodland	S1.1	2,159	53.5
Stabilized Interior Dunes	S1.1	333	8.2
Valley Sink Scrub	S1.1	44,051	403.8
Cismontane Alkali Marsh	S1.1	61,541	204.0
Monterey Pine Forest	S1.1	12,949	10.9
Northern Maritime Chaparral	S1.2	3,727	53.5
Alkali Meadow	S2.1	2,408	226.0
Alkali Seep	S2.1	2,346	204.0
Coastal Terrace Prairie	S2.1	684	26.5
Northern Vernal Pool	S2.1	8,900	144.9
Coastal Brackish Marsh	S2.1	27,204	173.0
Coastal and Valley Freshwater Marsh	S2.1	24,113	12.9
Valley Oak Woodland	S2.1	47,933	17.2
Serpentine Bunchgrass	S2.2	11,827	1,160.0
Central Dune Scrub	S2.2	27,860	3.1
Northern Interior Cypress Forest	S2.2	28,859	2.3
Wildflower Field	S2.2	10,178	0.8
Valley Needlegrass Grassland	S3.1	49,689	1,103.8
Northern Hardpan Vernal Pool	S3.1	100,386	11.9
Northern Coastal Salt Marsh	S3.2	29,291	705.7
North Central Coast Steelhead/Sculpin Stream	SNR	1,182	66.7
N. Central Coast Calif. Roach/Stickleback/Steelhead Stream	SNR	1,886	70.6

Source: California Department of Fish and Wildlife 2018a

^a State Rank:

S1 = critically imperiled; S2 = imperiled; S3 = vulnerable; SNR = unranked
.1 = very threatened; .2 = moderate threat; .3 = few or no current threats

Special-Status Species

The potential for special-status plant and wildlife species to occur in the study area was determined based on the results of a desktop-level review of biological literature and databases. Searches of the nine Bay Area counties were performed in the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2018a, 2018b), which is maintained by CDFW, *Inventory of Rare and Endangered Plants* (California Native Plant Society 2018), and the USFWS Information

for Planning and Consultation online tool (U.S. Fish and Wildlife Service 2020). These searches generated a list of special-status plant and wildlife species with one or more occurrences in the Bay Area. Species were considered special-status if they met one or more of the following criteria.

- Plant and wildlife species listed as endangered, threatened, or candidates for listing under the FESA.
- Plant and wildlife species listed as endangered, threatened, or candidates for listing under the CESA.
- Plant species listed as endangered or rare under the NPPA.
- Wildlife species designated as fully protected species, as defined in California Fish and Game Code Sections 3511, 4700, 5050, and 5515.
- Wildlife species designated as Species of Special Concern by CDFW.
- CRPR List 1, 2, 3, and 4 plant species designated by the CNPS.
- Bald eagles and golden eagles, which are protected by the BGEPA.

Species were categorized by the likelihood of observance using information from the literature and database searches; for plants, herbarium records and field surveys were also used to confirm presence of 158 occurrences of several dozen special-status plants in the utility ROW. Therefore, the identification and categorization for special-status plants included, in part, field surveys for species likely to occur in PG&E's gas or electric utility corridors or otherwise be subject to potential impacts from covered activities (ICF 2016). The special-status species categories are as follows:

- **Present:** The occurrence or observation of a species ~~was documented~~ known to occur in the Permit Area at the time of this EIR preparation, or is subsequently documented during pre-activity surveys for covered activities (including focused plant surveys), or during monitoring of covered activities, or PG&E assumes the presence of the species within the study area.
- **Likely to occur:** The species is likely to be found in the Permit Area during implementation of covered activities. A species is categorized as "likely to occur" if recorded observations (e.g., CNDDDB occurrences or other records not made by PG&E staff or contractors) are documented within 1 mile of the Permit Area and suitable habitat that meets the life history requirements of the species is present in or near the Permit Area.
- **Potential to occur:** There is a possibility that the species can be found in the Permit Area during implementation of covered activities, but it has not been directly observed during prior surveys or monitoring of covered activities. A species is categorized as having the "potential to occur" if recorded observations (e.g., CNDDDB occurrences or other records not made by PG&E staff or contractors) are documented between 1 mile and 5 miles from facilities in the Permit Area and suitable habitat that meets the life history requirements of the species is present in or near the Permit Area.
- **Unlikely to occur:** The species is not likely to occur in the Permit Area over the 30-year term of the ITP based on the following considerations:
 - Suitable habitat or potential habitat and features that are required to satisfy the life history requirements of the species are currently absent from the Permit Area and unlikely to become established there in the future.

- Predators or invasive species that inhibit survival or occupation are present and may continue to be present in the future.
- Nearby occurrence records are not documented or are more than 25 years old.
- Barriers to wildlife migration or dispersal are present and may continue to be in the future.
- **Absent:** Suitable habitat does not exist in the Permit Area, or the species is restricted to or known to be present only within a specific area outside of the Permit Area. Nearby occurrence records are not documented or are more than 50 years old.

For species that qualified for more than one category, professional judgment and information from the literature and database searches informed the likelihood of observance. The age of the record of sighting (e.g., less than 25 years old) is not specified for “likely to occur” and “potential to occur”; therefore, determinations were made based on the potential lack of relatively recent survey data using species-specific requirements for suitable habitat, the location and accuracy of the records, and species’ ranges.

Special-Status Plants

All special-status plant species identified in the literature review are described in Table 3.4-3, which includes the listing status, habitat requirements, flowering phenology/life forms, known locations, and the potential for each species to occur within the Permit Area. Special-status plant occurrences documented in the Permit Area during special-status plant species assessments and field surveys (ICF 2016) were also identified. The results of the plant species and general resource assessment surveys are discussed further under Impact BIO-1 in Section 3.4.2, *Environmental Impacts*, and in Table 3.4-3. Of the 413 special-status plant species considered, 28 were determined to be present, 207 were determined to be likely to occur, 134 were determined to have a potential to occur, and 31 were determined to be unlikely to occur. In addition, 13 of the special-status plant species were determined to be absent due to range restrictions or lack of suitable habitat in the study area.

Special-Status Wildlife

All special-status wildlife species identified in the literature review are described in Table 3.4-4, which includes the listing status, life history, summary of the sightings and records, and the likelihood of each species to occur within the Permit Area. The results of the biological resource analysis are discussed further under Impact BIO-1 in Section 3.4.2. A desktop survey of observations, records, and known distribution determined that of the -103 special-status wildlife species considered, 0 species were present, -38 are likely to occur, 51 have the potential to occur, and 10 are unlikely to occur. In addition, four were determined to be absent due to range restrictions or lack of suitable habitat in the Permit Area.

Critical Habitat

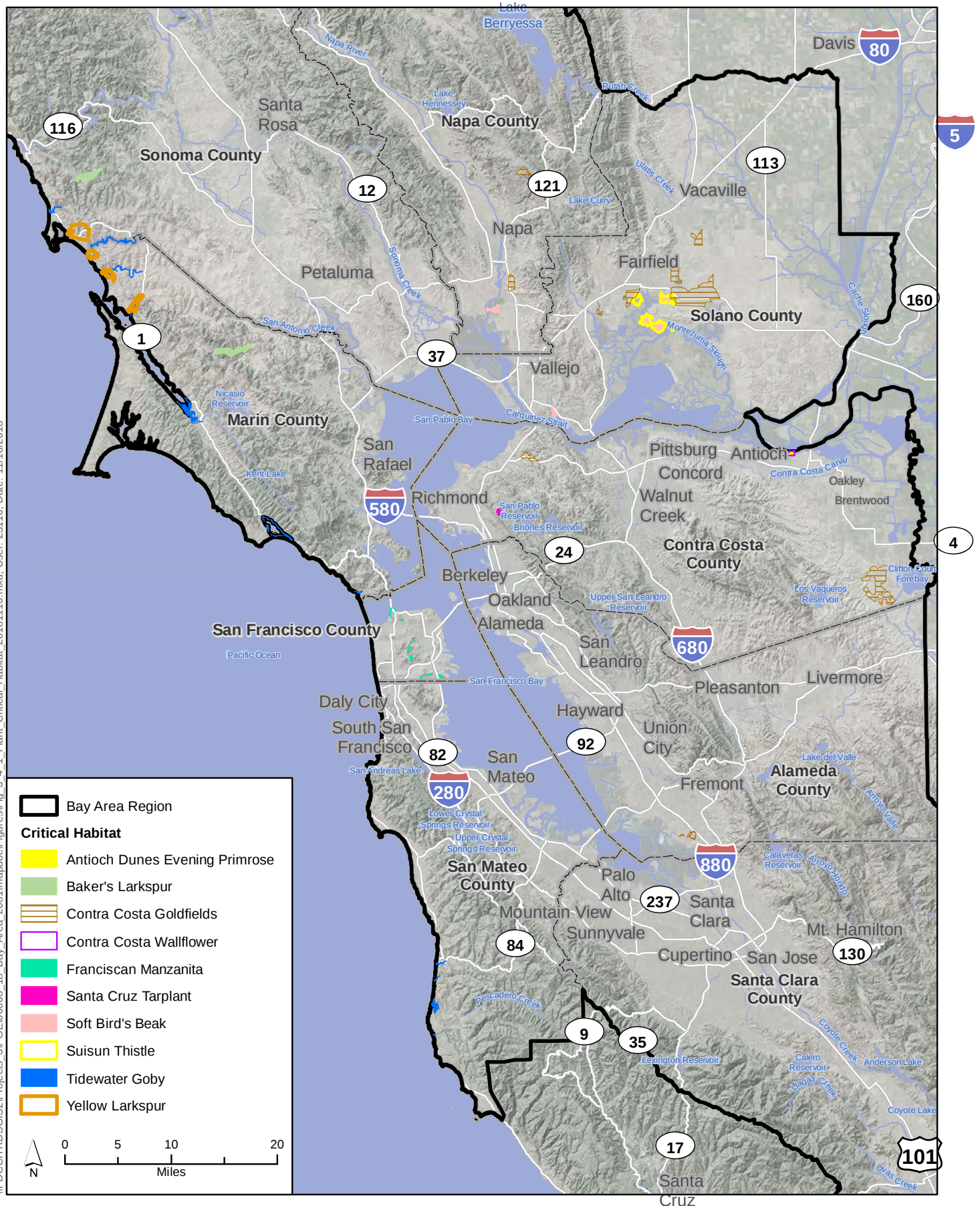
Under the FESA, to the extent prudent and determinable, the USFWS is required to designate critical habitat for endangered and threatened species (16 USC Section 1533 [a][3]). Critical habitat is defined as specific geographic areas that contain the physical and biological features essential for the survival and recovery of endangered and threatened species. Designated critical habitat includes sites for breeding and rearing, movement or migration, feeding, roosting, cover, and shelter. Designated critical habitats require special management and protection of existing resources,

including water quality and quantity, host animals and plants, food availability, pollinators, sunlight, and specific soil types.

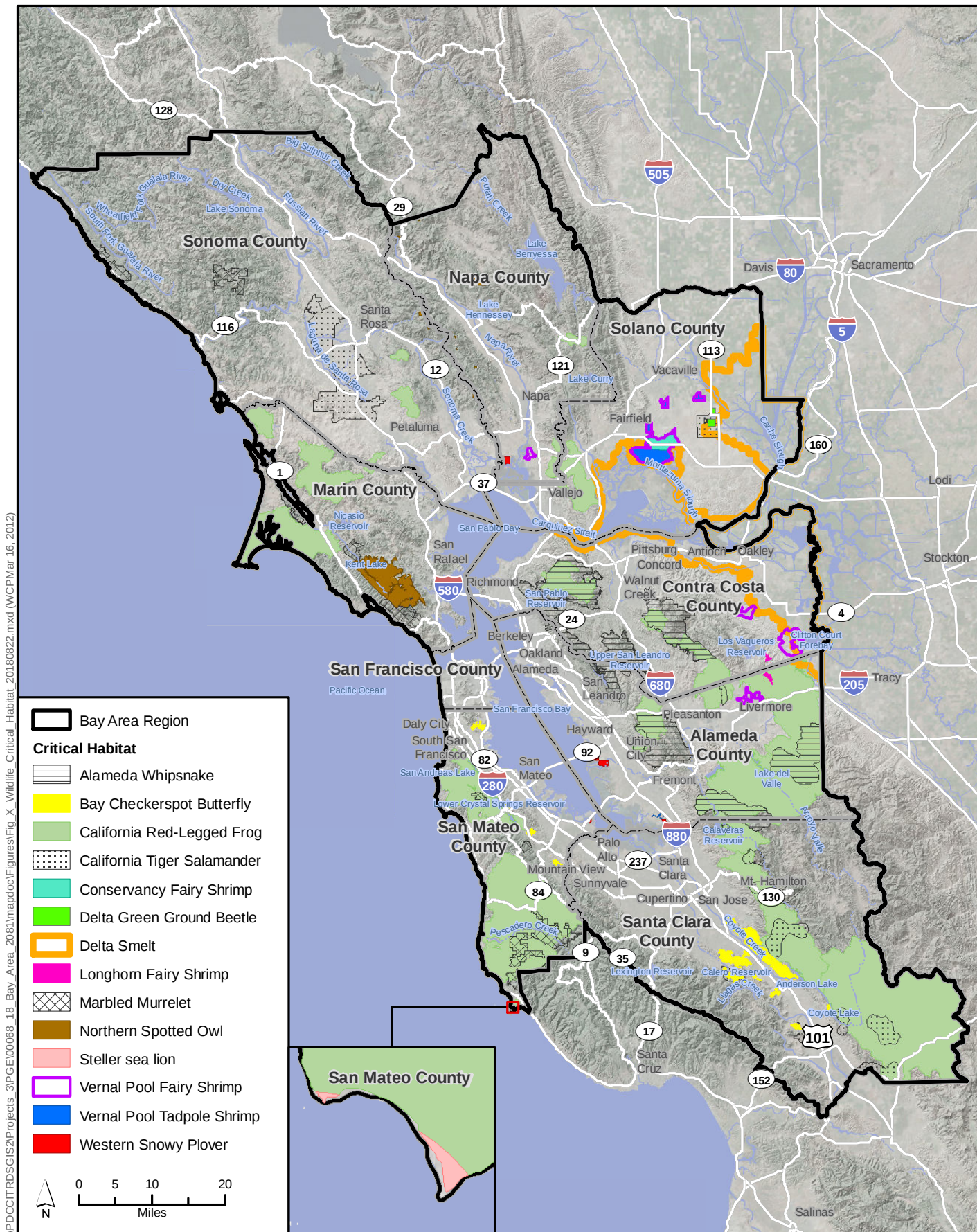
The facilities in the Permit Area cross USFWS-designated critical habitat for the following 26 plant and wildlife species.

- Franciscan manzanita (*Arctostaphylos franciscana*)
- Soft bird's beak (*Chloropyron molle* ssp. *molle*)
- Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*)
- Baker's larkspur (*Delphinium bakeri*)
- Yellow (golden) larkspur (*Delphinium luteum*)
- Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*)
- Santa Cruz tarplant (*Holocarpha macradenia*)
- Contra Costa goldfields (*Lasthenia conjugens*)
- Antioch Dunes evening primrose (*Oenothera deltoides* ssp. *howellii*)
- Conservancy fairy shrimp (*Branchinecta conservatio*)
- Longhorn fairy shrimp (*Branchinecta longiantenna*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Vernal pool tadpole shrimp (*Lepidurus packardii*)
- Delta green ground beetle (*Elaphrus viridis*)
- Bay checkerspot butterfly (*Euphydryas editha bayensis*)
- Chinook salmon (*Oncorhynchus tshawytscha*)
- Steelhead (*Oncorhynchus mykiss irideus*)
- Delta smelt (*Hypomesus transpacificus*)
- Tidewater goby (*Eucyclogobius newberryi*)
- California tiger salamander (*Ambystoma californiense*) (Central California Distinct Population Segment [DPS] and Sonoma County DPS)
- California red-legged frog (*Rana draytonii*)
- Alameda whipsnake (*Masticophis lateralis euryxanthus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- Steller sea lion (*Eumetopias jubatus*)

Table 3.4-5 summarizes the critical habitat for federally listed species in the study area, including the designation date for each species and the total number of acres of designated critical habitat in California. Figures 3.4-1 and 3.4-2 depict critical habitat in the study area.



**Figure 3.4-1
Plant Critical Habitat**



**Figure 3.4-2
Wildlife Critical Habitat**

Table 3.4-3. Special-Status Plant Species’ Probability of Occurrence in the Permit Area

Species Name	Status ^a Federal/State/ CRPR	Habitat Requirements	Flowering Phenology/ Life Form	Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
Adoxaceae – Moschatel Family					
<i>Viburnum ellipticum</i> Oval-leaved viburnum	–/–/2B.3	This species occurs in chaparral, oak woodlands, and lower montane coniferous forest from 700 to 4,600 feet elevation.	May–June / Shrub	There are 17 CNDDDB occurrence records of oval-leaved viburnum in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where chaparral, oak woodland, and montane hardwood-conifer forest are present in northern Napa County.
Agavaceae – Agave Family					
<i>Chlorogalum pomeridianum</i> var. <i>minus</i> Dwarf soaproot	–/–/1B.2	This species occurs in openings in chaparral and grasslands from 1,000 to 3,280 feet elevation. It occurs on serpentine soils.	May–August / Perennial Herb	There are 4 CNDDDB occurrence records of dwarf soaproot in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where serpentine soils coincide with grassland or chaparral in the study area.
Alismataceae – Water-Plantain Family					
<i>Sagittaria sanfordii</i> Sanford’s arrowhead	–/–/1B.2	This species occurs in freshwater marsh, sloughs, canals, and other slow-moving water habitats, below 2,130 feet elevation.	May–October / Perennial herb	There are 7 CNDDDB occurrence records of Sanford’s arrowhead in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where freshwater emergent wetlands is present in the study area.
Alliaceae – Onion Family					
<i>Allium fimbriatum</i> var. <i>purdyi</i> Purdy’s onion	–/–/4.3	This species occurs on serpentine outcrops in chaparral and oak woodland, at 985 to 1,970 feet elevation.	April–June / Perennial herb	There are 2 herbarium records of Purdy’s onion in the study area.	Potential to occur. The Permit Area is located at the margin of the range of this species. Potential habitat for this species occurs where serpentine chaparral is present in northern Napa County.
<i>Allium howellii</i> var. <i>howellii</i> Howell’s onion	–/–/4.3	This species occurs on grassy slopes from 655 to 2,950 feet elevation. It sometimes occurs on serpentine soils.	March–April / Perennial herb	There is 1 herbarium record of Howell’s onion in the study area.	Potential to occur. The Permit Area is located at the margin of the range of this species. Potential habitat for this species occurs where serpentine grasslands are present in southern Santa Clara County.
<i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion	–/–/1B.2	This species occurs in grasslands and woodlands from 165 to 1,000 feet elevation. It occurs on clay serpentine soils.	May–June / Perennial herb	There are 24 CNDDDB occurrence records of Franciscan onion in the study area.	Likely to occur. The Permit Area intersects 13 occurrences of this species. Potential habitat for this species occurs where serpentine grasslands are present in the study area.
<i>Allium sharsmithiae</i> Sharsmith's onion	–/–/1B.3	This species occurs on rocky slopes, in chaparral or cypress woodland from 1,310 to 3,940 feet elevation. It occurs on serpentine substrates.	March–May / Perennial herb	There are 7 CNDDDB occurrence records of Sharsmith’s onion in the study area.	Potential to occur. The Permit Area does not intersect any known occurrences of this species. Potential habitat for this species occurs where serpentine chaparral or closed-cone coniferous forest is present in eastern Alameda and Santa Clara County.
Apiaceae – Carrot Family					
<i>Cicuta maculata</i> var. <i>bolanderi</i> Bolander's water-hemlock	–/–/2B.1	This species occurs in freshwater or brackish marsh, below 655 feet elevation.	July–September / Perennial herb	There are 15 CNDDDB occurrence records of Bolander’s water-hemlock in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in the study area.
<i>Eryngium aristulatum</i> var. <i>hooveri</i> Hoover's button-celery	–/–/1B.1	This species occurs in vernal pools, between 3,345 and 4,755 feet elevation.	July / Perennial herb	There are 9 CNDDDB occurrence records of Hoover’s button-celery in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Contra Costa, Alameda and Santa Clara Counties.
<i>Eryngium constancei</i> Loch Lomond coyote-thistle	E/E/1B.1	This species occurs in vernal pools, at approximately 2,600 feet elevation.	April–June / Perennial herb	There is 1 CNDDDB occurrence record of Loch Lomond coyote-thistle in the study area.	Unlikely to occur. The Permit Area does not intersect any known occurrences of this species. Potential habitat for this occurs where vernal pools are present in Napa County (ICF 2016).
<i>Eryngium jepsonii</i> Jepson’s coyote-thistle	–/–/1B.2	This species occurs in grasslands on moist clay soils (wetted by spring rains), below 1,640 feet elevation.	April–August / Perennial herb	There are 17 CNDDDB occurrence records of Jepson’s coyote-thistle in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this occurs where annual grasslands are present in the study area.
<i>Eryngium racemosum</i> Delta coyote-thistle	–/–/1B.1	This species occurs in seasonally inundated depressions along floodplains, between 10 and 100 feet elevation.	June–October / Perennial herb	There is 1 CNDDDB occurrence record of Delta coyote-thistle in the study area.	Unlikely to occur. The Permit Area does not intersect any known occurrences of this species. Potential habitat for this species occurs where floodplains are present in Contra Costa County (ICF 2016).
<i>Eryngium spinosepalum</i> Spiny-sepaled button-celery	–/–/1B.2	This species occurs in vernal pools, swales, and roadside ditches, between 325 and 2,625 feet elevation.	April–July / Perennial herb	There is 1 CNDDDB occurrence record of spiny-sepaled button-celery in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. The study area is located at the margin of the range of this species, but potential habitat for this species occurs where vernal pools are present in Contra Costa County.

Species Name	Status ^a Federal/State/ CRPR	Habitat Requirements	Flowering Phenology/ Life Form	Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Lilaeopsis masonii</i> Mason’s lilaeopsis	–/R/1B.1	This species occurs in freshwater or brackish marsh within the tidal zone, below 15 feet elevation.	April–October / Perennial herb	There are 129 CNDDDB occurrence records of Mason’s lilaeopsis in the study area.	Present. The Permit Area intersects 29 occurrences of this species. Potential habitat for this species occurs where high-elevation tidal marsh is present in Napa, Solano, and Contra Costa Counties (ICF 2016).
<i>Lomatium hooveri</i> Hoover’s lomatium	–/–/4.3	This species occurs in serpentine chaparral and woodlands, between 985 and 1,970 feet elevation.	April–May / Perennial herb	There are 12 herbarium records of Hoover’s lomatium in the study area.	Potential to occur. The Permit Area is located at the margin of the range of this species. Potential habitat for this species occurs where serpentine chaparral is present in northern Napa County.
<i>Lomatium observatorium</i> Mt. Hamilton lomatium	–/–/1B.2	This species occurs in oak woodland, between 4,000 and 4,360 feet elevation.	March–May / Perennial herb	There are 3 CNDDDB occurrence records of Mt. Hamilton lomatium in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where oak woodland is present in Santa Clara County.
<i>Lomatium repostum</i> Napa lomatium	–/–/4.3	This species occurs in serpentine chaparral and woodlands, between 330 and 2,625 feet elevation.	April–May / Perennial herb	There are 40 herbarium records of Napa lomatium in the study area.	Potential to occur. The Permit Area is located within the range of this species. Potential habitat occurs where serpentine chaparral is present in the study area.
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i> Gairdner’s yampah	–/–/4.2	This species occurs in grasslands, coastal prairies, and open areas in conifer forest, below 1,500 feet elevation.	June–July / Perennial herb	There are 41 herbarium records of Gairdner’s yampah in the study area.	Potential to occur. The Permit Area is located within the range of this species. Potential habitat occurs where grasslands are present in the study area.
<i>Sanicula hoffmannii</i> Hoffmann’s sanicle	–/–/4.3	This species occurs on clay or serpentine soils, in coastal scrub, chaparral, oak woodland, broadleafed upland forest, and lower montane coniferous forest between 100 and 985 feet elevation.	March–May / Perennial herb	There are 4 herbarium records of Hoffmann’s sanicle in the study area.	Potential to occur. The Permit Area is located at the margin of the range of this species. Potential habitat for this species occurs where coastal scrub, chaparral, coastal oak woodland, and montane hardwood-conifer forest are present in San Mateo and western Santa Clara Counties.
<i>Sanicula maritima</i> Adobe sanicle	–/ R/1B.1	This species occurs in moist clay or ultramafic soils, in meadows and grasslands at approximately 490 feet elevation.	April–May / Perennial herb	There are 2 CNDDDB occurrence records of adobe sanicle in the study area.	Unlikely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat occurs where serpentine grassland is present in San Francisco, San Mateo, Santa Clara, and Alameda Counties (ICF 2016).
<i>Sanicula saxatilis</i> Rock sanicle	–/ R/1B.2	This species occurs in bedrock outcrops and talus slopes in chaparral and oak woodland between 2,000 and 4,100 feet elevation.	April–May / Perennial herb	There are 7 CNDDDB occurrence records of rock sanicle in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where chaparral or oak woodland is present in Alameda, Contra Costa, and Santa Clara Counties.
Apocynaceae – Dogbane Family					
<i>Asclepias solanoana</i> Serpentine milkweed	–/–/4.2	This species occurs in serpentine outcrops, between 2,295 and 4,250 feet elevation.	June / Perennial herb	There are 4 herbarium records of serpentine milkweed in the study area.	Potential to occur. The Permit Area is located at the margin of the range of this species. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma and Napa Counties.
Asteraceae – Composite Family					
<i>Balsamorhiza macrolepis</i> Big-scale balsamroot	–/–/1B.2	This species occurs in grasslands, foothill woodlands, and rocky hillsides below 5,100 feet elevation.	March–June / Perennial herb	There are 16 CNDDDB occurrence records of big-scale balsamroot in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where grasslands or blue oak woodland is present in the study area.
<i>Blennosperma bakeri</i> Sonoma sunshine	E/E/1B.1	This species occurs in vernal pools between 65 and 130 feet elevation.	March–May / Annual herb	There are 24 CNDDDB occurrence records of Sonoma sunshine in the study area.	Likely to occur. The Permit Area intersects 18 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma County (ICF 2016).
<i>Blennosperma nanum</i> var. <i>robustum</i> Point Reyes stickyseed	–/ R/1B.2	This species occurs in coastal scrub and perennial grasslands located on sandy soils, between 100 and 395 feet elevation.	January–April / Annual herb	There are 12 CNDDDB occurrence records of Point Reyes stickyseed in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where coastal scrub or perennial grasslands are present in Sonoma County (ICF 2016).
<i>Blepharizonia plumosa</i> Big tarplant	–/–/1B.1	This species occurs in annual grasslands, on dry hills and plains between 50 and 1,500 feet elevation.	July–October / Annual herb	There are 35 CNDDDB occurrence records of big tarplant in the study area.	Likely to occur. The Permit Area intersects 18 occurrences of this species. Potential habitat for this species occurs where annual grasslands are present in Contra Costa and Alameda Counties.
<i>Calycadenia micrantha</i> Small-flowered calycadenia	–/–/1B.2	This species occurs in rocky open areas in chaparral and grasslands between 1,430 and 4,610 feet elevation.	June–October / Annual herb	There is 1 herbarium record of small-flowered calycadenia in the study area.	Potential to occur. The Permit Area is located within the range of this species. Potential habitat for this species occurs where annual grassland or mixed chaparral are present in Napa County.
<i>Centromadia parryi</i> ssp. <i>congdonii</i> Congdon’s tarplant	–/–/1B.2	This species occurs in annual grassland, on lower slopes, flats, and swales below 560 feet elevation. It sometimes occurs on alkaline or saline soils.	June–November / Annual herb	There are 29 CNDDDB occurrence records of Congdon’s tarplant in the study area.	Likely to occur. The Permit Area intersects 15 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Solano, Contra Costa, Alameda, and Santa Clara Counties.

Species Name	Status ^a Federal/State/ CRPR	Habitat Requirements	Flowering Phenology/ Life Form	Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Centromadia parryi</i> ssp. <i>parryi</i> Pappose tarplant	-/-/1B.2	This species occurs in coastal prairies, meadows, seeps, coastal salt marsh, and annual grasslands below 1,380 feet elevation.	July–October / Annual herb	There are 28 CNDDDB occurrence records of pappose tarplant in the study area.	Likely to occur. The Permit Area intersects 22 occurrences of this species. Potential habitat for this species occurs where annual grassland or saline emergent wetland is present in Sonoma, Napa, Solano, and San Mateo Counties.
<i>Centromadia parryi</i> ssp. <i>rudis</i> Parry’s red tarplant	-/-/4.2	This species occurs in alkali meadows and grasslands below 150 feet elevation.	June–October / Annual herb	There are 9 herbarium records of Parry’s red tarplant in the study area.	Likely to occur. Potential habitat for this species occurs where annual grassland or saline emergent wetland is present in Sonoma, Napa, and Solano Counties.
<i>Cirsium andrewsii</i> Franciscan thistle	-/-/1B.2	This species occurs in moist areas in coastal prairies, coastal scrub, and mixed evergreen forests, below 440 feet elevation. It sometimes occurs on serpentinite.	March–July / Perennial herb	There are 31 CNDDDB occurrence records of Franciscan thistle in the study area.	Likely to occur. The Permit Area intersects 14 occurrences of this species. Potential habitat for this species occurs where coastal scrub and perennial grassland is present in San Francisco and Marin Counties.
<i>Cirsium fontinale</i> var. <i>campylon</i> Mt. Hamilton thistle	-/-/1B.2	This species occurs in serpentine seeps and streams at 425 to 2,885 feet elevation.	April–October / Perennial herb	There are 33 CNDDDB occurrence records of Mt. Hamilton thistle in the study area.	Likely to occur. The Permit Area intersects 15 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland on serpentine soils is present in Santa Clara County.
<i>Cirsium fontinale</i> var. <i>fontinale</i> Fountain thistle	E/E/1B.1	This species occurs in seeps in chaparral and grasslands on serpentinite, at 395 to 490 feet elevation.	June–October / Perennial herb	There are 5 CNDDDB occurrence records of fountain thistle in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland in serpentine soils is present in San Mateo County (ICF 2016).
<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i> Suisun thistle	E/-/1B.1	This species occurs in salt marsh at sea level.	July–September / Perennial herb	There are 4 CNDDDB occurrence records of Suisun thistle in the study area.	Unlikely to occur. The Permit Area does not intersect any known occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Solano County (ICF 2016).
<i>Cirsium hydrophilum</i> var. <i>vaseyi</i> Mt. Tamalpais thistle	-/-/1B.2	This species occurs in serpentine seeps and streams, in chaparral and broadleafed upland forests at 985 to 1,475 feet elevation.	May–August / Perennial herb	There are 14 CNDDDB occurrence records of Mt. Tamalpais thistle in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland on serpentine soils is present in Marin County.
<i>Cirsium occidentale</i> var. <i>compactum</i> Compact cobwebby thistle	-/-/1B.2	This species occurs in coastal dunes, coastal prairie, coastal scrub, and chaparral below 165 feet elevation.	April–June / Perennial herb	There is 1 CNDDDB occurrence record of compact cobwebby thistle in the study area.	Potential to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in San Francisco and San Mateo Counties.
<i>Cirsium praeteriens</i> Lost thistle	-/-/1A	This species is presumed extinct and has unknown habitat requirements below 330 feet elevation.	June–July / Perennial herb	There is 1 CNDDDB occurrence record of lost thistle in the study area.	Absent. The Permit Area intersects 1 occurrence of this species in Santa Clara County. This species has not been observed since it was last collected in 1901 and is believed to be extinct.
<i>Corethrogyne leucophylla</i> Branching beach aster	-/-/3.2	This species occurs in closed-cone coniferous forest, coastal dunes at 10 to 195 feet elevation.	May–December / Perennial herb	There are no records of branching beach aster in the study area.	Potential to occur. Potential habitat for this species occurs where dunes are present in San Mateo County.
<i>Deinandra bacigalupii</i> Livermore tarplant	-/E/1B.2	This species occurs in alkali grassland at 330 to 650 feet elevation.	June–October / Annual herb	There are 4 CNDDDB occurrence records of Livermore tarplant in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where annual grassland on alkaline soils is present in Alameda County.
<i>Erigeron biolettii</i> Streamside daisy	-/-/3	This species occurs in moist rocky areas in broadleafed upland forest, north coast coniferous forest from 100 to 3,610 feet elevation.	June–October / Perennial herb	There are 35 herbarium records of streamside daisy in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where rocky outcrops in oak woodlands, broadleaf evergreen forest, or North Coast Coniferous Forest are present in Marin, Sonoma, Napa, and Solano Counties.
<i>Erigeron greenei</i> Greene’s narrow-leaved daisy	-/-/1B.2	This species occurs in chaparral, on serpentinite and volcanic substrates from 295 to 1,265 feet elevation.	May–September / Perennial herb	There are 16 CNDDDB occurrence records of Greene’s narrow-leaved daisy in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Napa and Sonoma Counties.
<i>Erigeron serpentinus</i> Serpentine daisy	-/-/1B.3	This species occurs in chaparral, on serpentine substrates from 195 to 2,200 feet elevation.	May–August / Perennial herb	There are 6 CNDDDB occurrence records of serpentine daisy in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma County.
<i>Erigeron supplex</i> Supple daisy	-/-/1B.2	This species occurs in coastal scrub and perennial grassland from 30 to 165 feet elevation.	May–July / Perennial herb	There are 8 CNDDDB occurrence records of supple daisy in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where coastal scrub or perennial grassland are present in Marin and Sonoma Counties.
<i>Eriophyllum jepsonii</i> Jepson’s woolly sunflower	-/-/4.3	This species occurs in chaparral, cismontane woodland, coastal scrub on dry, rocky slopes, between 1,000 and 3,500 feet elevation. It sometimes occurs on serpentinite substrates.	April–June / Perennial herb	There are about 14 herbarium records of Jepson’s woolly sunflower in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub, chaparral, or oak woodlands are present in Alameda, Santa Clara, and Contra Costa Counties.

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<i>Eriophyllum latilobum</i> San Mateo woolly sunflower	E/E/1B.1	This species occurs in open areas in coast live oak woodland from 150 to 1,080 feet elevation.	May–June / Perennial herb	There are 5 CNDDDB occurrence records of San Mateo woolly sunflower in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where coastal oak woodland is present in San Mateo County.
<i>Grindelia hirsutula</i> var. <i>maritima</i> San Francisco gumplant	–/–/1B.2	This species occurs in coastal bluff scrub, coastal scrub, and grasslands from 50 to 1,310 feet elevation.	June–September / Perennial herb	There are 15 CNDDDB occurrence records of San Francisco gumplant in the study area.	Likely to occur. The Permit Area intersects 15 occurrences of this species. Potential habitat for this species occurs where coastal scrub or perennial grasslands are present in San Francisco and Marin Counties.
<i>Harmonia hallii</i> Hall’s harmonia	–/–/1B.2	This species occurs in open areas in serpentine chaparral from 770 to 3,050 feet elevation.	April–June / Annual herb	There are 7 CNDDDB occurrence records of Hall’s harmonia in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in northern Napa County.
<i>Harmonia nutans</i> Nodding harmonia	–/–/4.3	This species occurs in woodlands and open areas in chaparral, on rocky, volcanic soils from 330 to 3,300 feet elevation.	April–June / Annual herb	There are 66 herbarium records of Nodding harmonia in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or oak woodland is present in Sonoma and Napa Counties.
<i>Helianthella castanea</i> Diablo helianthella	–/–/1B.2	This species occurs in chaparral and oak woodlands, often in partial shade and on rocky soils, between 80 and 3,800 feet elevation.	March–June / Perennial herb	There are 107 CNDDDB occurrence records of Diablo helianthella in the study area.	Likely to occur. The Permit Area intersects 32 occurrences of this species. Potential habitat for this species occurs where chaparral or oak woodland is present in Contra Costa, Alameda, San Francisco, and San Mateo Counties.
<i>Helianthus exilis</i> Serpentine sunflower	–/–/4.2	This species occurs on streambanks in gravelly serpentine soils from 985 to 4,265 feet elevation.	June–November / Annual herb	There are three herbarium records of serpentine sunflower in the study area.	Potential to occur. The Permit Area is located at the margin of the range of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
<i>Hemizonia congesta</i> ssp. <i>congesta</i> Seaside tarplant	–/–/1B.2	This species occurs in grasslands from 66 to 1,835 feet elevation.	April– November / Annual herb	There are 50 CNDDDB occurrence records of seaside tarplant in the study area.	Likely to occur. The Permit Area intersects 40 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Sonoma, Marin, San Francisco, and San Mateo Counties.
<i>Hesperervax caulescens</i> Hogwallow starfish	–/–/4.2	This species occurs in vernal pools and flats, on clay soils, below 1,655 feet elevation.	March–June / Annual herb	There are 26 herbarium records of hogwallow starfish in the study area.	Potential to occur. Potential habitat for this species occurs where vernal pools and annual grassland are present in Solano, Contra Costa, and Alameda Counties.
<i>Hesperervax sparsiflora</i> var. <i>brevifolia</i> Short-leaved evax	–/–/1B.2	This species occurs in coastal dunes and sandy areas in coastal bluff scrub below 705 feet elevation.	March–June / Annual herb	There are 23 CNDDDB occurrence records of short-leaved evax in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Sonoma, Marin, San Francisco, and San Mateo Counties.
<i>Holocarpha macradenia</i> Santa Cruz tarplant	T/E/1B.1	This species occurs in coastal terrace grasslands on light sandy to sandy clay soils, below 300 feet elevation.	June–October / Annual herb	There are 18 CNDDDB occurrence records of Santa Cruz tarplant in the study area.	Unlikely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Alameda County (ICF 2016).
<i>Isocoma arguta</i> Carquinez goldenbush	–/–/1B.1	This species occurs in annual grassland on alkaline soils below 65 feet elevation.	August– December / Perennial herb	There are 14 CNDDDB occurrence records of Carquinez goldenbush in the study area.	Likely to occur. The Permit Area intersects 10 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Solano County.
<i>Isocoma menziesii</i> var. <i>diabolica</i> Satan’s goldenbush	–/–/4.2	This species occurs on slopes and cliffs in foothill woodlands and grasslands, below 2,640 feet elevation.	August– November / Perennial herb	There are 8 herbarium records of Satan’s goldenbush in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland or oak woodland are present in Santa Clara County.
<i>Lasthenia burkei</i> Burke’s goldfields	E/E/1B.1	This species occurs in vernal pools and wet meadows from 50 to 1,970 feet elevation.	April–June / Annual herb	There are 28 CNDDDB occurrence records of Burke’s goldfields in the study area.	Present. The Permit Area intersects 20 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma County (ICF 2016).
<i>Lasthenia californica</i> ssp. <i>bakeri</i> Baker’s goldfields	–/–/1B.2	This species occurs in coastal scrub and openings in closed-cone coniferous forest from 195 to 1,705 feet elevation.	April–October / Perennial herb	There are 9 CNDDDB occurrence records of Baker’s goldfields in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where open, grassy areas within coastal scrub or closed-cone coniferous forest are present in Sonoma and Marin Counties.
<i>Lasthenia californica</i> ssp. <i>macrantha</i> Perennial goldfields	–/–/1B.2	This species occurs in coastal bluff scrub, coastal dunes, and coastal scrub from 15 to 1,705 feet elevation.	January– November / Perennial herb	There are 35 CNDDDB occurrence records of perennial goldfields in the study area.	Likely to occur. The Permit Area intersects 17 occurrences of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in Sonoma, Marin, San Francisco, and San Mateo Counties.
<i>Lasthenia conjugens</i> Contra Costa goldfields	E/–/1B.1	This species occurs in alkaline or saline vernal pools and swales, below 700 feet elevation.	March–June / Annual herb	There are 28 CNDDDB occurrence records of Contra Costa goldfields in the study area.	Present. The Permit Area intersects 20 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in the study area (ICF 2016).
<i>Lasthenia ferrisiae</i> Ferris’s goldfields	–/–/4.2	This species occurs in vernal pools and wet saline flats below 2,295 feet elevation.	February–May / Annual herb	There are 10 herbarium records of Ferris’s goldfields in the study area.	Potential to occur. Potential habitat for this species occurs where vernal pools in alkaline soils are present in Contra Costa and Alameda Counties.

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<i>Layia carnosa</i> Beach layia	E/E/1B.1	This species occurs in coastal dunes below 195 feet elevation.	May–July / Annual herb	There are 7 CNDDDB occurrence records of beach layia in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where dunes are present in Marin and San Francisco Counties (ICF 2016).
<i>Layia septentrionalis</i> Colusa layia	–/–/1B.2	This species occurs on sandy or serpentine soils, in grasslands and openings in chaparral and foothill woodlands from 330 to 3,595 feet elevation.	April–May / Annual herb	There are 18 CNDDDB occurrence records of Colusa layia in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where serpentine grassland or serpentine chaparral are present in Sonoma and Napa Counties.
<i>Leptosyne hamiltonii</i> Mt. Hamilton coreopsis	–/–/1B.2	This species occurs in openings in chaparral and oak-pine woodland, on shale talus slopes from 1,805 to 4,265 feet elevation.	March–May / Annual herb	There are 19 CNDDDB occurrence records of Mt. Hamilton coreopsis in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where chaparral or oak-pine woodland are present in Santa Clara County.
<i>Lessingia arachnoidea</i> Crystal Springs lessingia	–/–/1B.2	This species occurs in serpentine grassland and open grassy areas in serpentine chaparral from 195 to 655 feet elevation.	July–October / Annual herb	There are 11 CNDDDB occurrence records of Crystal Springs lessingia in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where serpentine grassland or serpentine chaparral are present in San Mateo County.
<i>Lessingia germanorum</i> San Francisco lessingia	E/E/1B.1	This species occurs in coastal scrub from 80 to 360 feet elevation.	June – November / Annual herb	There are 5 CNDDDB occurrence records of San Francisco lessingia in the study area.	Unlikely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in San Francisco and San Mateo Counties (ICF 2016).
<i>Lessingia hololeuca</i> Woolly-headed lessingia	–/–/3	This species occurs in clay or serpentinite substrates, in grasslands, coastal scrub, broadleaved upland forest, and lower montane coniferous forest from 50 to 1,000 feet elevation.	July–October / Annual herb	There are 99 herbarium records of woolly-headed lessingia in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub is present in the study area.
<i>Lessingia micradenia</i> var. <i>glabrata</i> Smooth lessingia	–/–/1B.2	This species occurs on serpentinite substrates in chaparral and oak woodland from 395 to 1,380 feet elevation.	July–November / Annual herb	There are 41 CNDDDB occurrence records of smooth lessingia in the study area.	Likely to occur. The Permit Area intersects 21 occurrences of this species. Potential habitat for this species occurs where serpentine grassland or oak woodland is present in Santa Clara County.
<i>Lessingia micradenia</i> var. <i>micradenia</i> Tamalpais lessingia	–/–/1B.2	This species occurs in serpentine grassland and chaparral from 330 to 1,640 feet elevation.	July–October / Annual herb	There are 9 CNDDDB occurrence records of Tamalpais lessingia in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral is present in Marin County.
<i>Lessingia tenuis</i> Spring lessingia	–/–/4.3	This species occurs in open grassy areas in chaparral and woodlands from 165 to 7,220 feet elevation.	May–July / Annual herb	There are 16 herbarium records of spring lessingia in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or oak woodland is present in Alameda, Santa Clara, and San Mateo Counties.
<i>Madia radiata</i> Showy madia	–/–/1B.1	This species occurs on slopes in oak woodland and grasslands below 3,000 feet elevation.	March–May / Annual herb	There are 9 CNDDDB occurrence records of showy madia in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Contra Costa County.
<i>Malacothrix phaeocarpa</i> Dusky-fruited malacothrix	–/–/4.3	This species occurs in openings in chaparral and Bishop Pine forest, on slides and after burns from 330 to 4,265 feet elevation.	April–June / Annual herb	There is 1 herbarium record of dusky-fruited malacothrix in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or closed-cone coniferous woodland is present in Santa Clara County.
<i>Micropus amphiboles</i> Mt. Diablo cottonweed	–/–/3.2	This species occurs in mixed evergreen forest, oak woodland, chaparral, and grasslands, from 150 to 2,715 feet elevation.	March–May / Annual herb	There are 36 herbarium records of Mt. Diablo cottonweed in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland, chaparral, oak woodland or montane hardwood-conifer forest are present in the study area.
<i>Microseris paludosa</i> Marsh microseris	–/–/1B.2	This species occurs in grasslands, coastal scrub, closed-cone coniferous forest, and cismontane woodlands from 15 to 1,165 feet elevation.	April–June / Perennial herb	There are 22 CNDDDB occurrence records of marsh microseris in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where annual grassland, coastal scrub, oak woodland, or closed-cone coniferous woodland is present in Sonoma, Marin, San Francisco, and San Mateo Counties.
<i>Microseris sylvatica</i> Sylvan microseris	–/–/4.2	This species occurs in grassland, oak woodland, and open grassy areas in chaparral; below 5,580 feet elevation.	March–June / Perennial herb	There are 22 herbarium records of sylvan microseris in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland, chaparral or oak woodland are present in the study area.
<i>Monolopia gracilens</i> Woodland woollythreads	–/–/1B.2	This species occurs on serpentine substrates in annual grasslands, oak woodlands, grassy openings in broadleaved upland forest, chaparral, and North Coast coniferous forest from 328 to 3,935 feet elevation.	February–July / Annual herb	There are 41 CNDDDB occurrence records of marsh microseris in the study area.	Likely to occur. The Permit Area intersects 30 occurrences of this species. Potential habitat for this species occurs where annual grassland, chaparral, oak woodland, or montane hardwood-conifer forest is present in Contra Costa, Alameda, Santa Clara, and San Mateo Counties.
<i>Packera clevelandii</i> Cleveland's ragwort	–/–/4.3	This species occurs in annual grasslands, often on serpentinite, from 115 to 2,035 feet elevation.	March–May / Annual herb	There are 16 herbarium records of Cleveland's ragwort in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.

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<i>Pentachaeta bellidiflora</i> White-rayed pentachaeta	E/E/1B.1	This species occurs in grassland and grassy openings in oak woodlands from 1,200 to 2,805 feet elevation.	March–May / Annual herb	There are 10 CNDDDB occurrence records of white-rayed pentachaeta in the study area.	Present. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in San Mateo County (ICF 2016).
<i>Pentachaeta exilis</i> ssp. <i>aeolica</i> San Benito pentachaeta	–/–/1B.2	This species occurs in vernal pools and swales from 30 to 1,640 feet elevation.	May–June / Annual herb	There are 6 CNDDDB occurrence records of San Benito pentachaeta in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where annual grassland or coastal oak woodland is present in Santa Clara County.
<i>Psilocarphus brevissimus</i> var. <i>multiflorus</i> Delta woolly-marbles	–/–/4.2	This species occurs in oak woodland, coastal scrub, open sandy, or rocky areas from 50 to 2,625 feet elevation.	January–April / Annual herb	There are 7 herbarium records of Delta woolly-marbles in the study area.	Potential to occur. Potential habitat for this species occurs where vernal pools are present in the study area.
<i>Senecio aphanactis</i> Chaparral ragwort	–/–/1B.2	This species occurs in serpentine seeps in chaparral from 365 to 2,955 feet elevation.	June–July / Perennial herb	There are 9 CNDDDB occurrence records of chaparral ragwort in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where annual grassland, coastal scrub, or oak woodland is present in the study area.
<i>Stebbinsoseris decipiens</i> Santa Cruz microseris	–/–/1B.2	This species occurs in grasslands, coastal prairie, and open grassy areas in other habitat types from 35 to 1,640 feet elevation.	April–May / Annual herb	There are 6 CNDDDB occurrence records of Santa Cruz microseris in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where perennial grassland is present in Marin County.
<i>Symphiotrichum lentum</i> Suisun Marsh aster	–/–/1B.2	This species occurs in brackish and freshwater marshes below 15 feet elevation.	August– November / Perennial herb	There are 107 CNDDDB occurrence records of Suisun Marsh aster in the study area.	Likely to occur. The Permit Area intersects 30 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in the study area.
<i>Tracyina rostrata</i> Beaked tracyina	–/–/1B.2	This species occurs in annual grassland and grassy slopes in oak woodlands from 295 to 950 feet elevation.	May–June / Annual herb	There is 1 CNDDDB occurrence record of beaked tracyina in the study area.	Likely to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where annual grassland and oak woodland is present in Sonoma County.
Azollaceae – Water Fern Family					
<i>Azolla microphylla</i> Mexican mosquito fern	–/–/4.2	This species occurs in ponds and the still water of streams and canals from 100 to 325 feet elevation.	August / Annual or perennial herb	There are 2 herbarium records of Mexican mosquito fern in the study area.	Potential to occur. Potential habitat for this species occurs where open water habitat is present in the study area.
Boraginaceae – Borage Family					
<i>Amsinckia grandiflora</i> Large-flowered fiddleneck	E/E/1B.1	This species occurs in valley grassland slopes below 1,200 feet elevation.	April–May / Annual herb	There are 5 CNDDDB occurrence records of large-flowered fiddleneck in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where annual grassland and oak woodland is present in Alameda and Contra Costa Counties.
<i>Amsinckia lunaris</i> Bent-flowered fiddleneck	–/–/1B.2	This species occurs in coastal bluff scrub, valley and foothill grasslands, and cismontane woodlands, from 10 to 1,645 feet elevation.	March–June / Annual herb	There are 48 CNDDDB occurrence records of bent-flowered fiddleneck in the study area.	Likely to occur. The Permit Area intersects 21 occurrences of this species. Potential habitat for this species occurs where coastal scrub, annual grassland, or blue oak woodland is present in the study area.
<i>Cryptantha dissita</i> Serpentine cryptantha	–/–/1B.1	This species occurs in chaparral, on serpentinite from 1,295 to 1,905 feet elevation.	April–May / Annual herb	There are 2 CNDDDB occurrence records of serpentine cryptantha in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
<i>Cryptantha hooveri</i> Hoover’s cryptantha	–/–/1A	This species occurs on coarse sandy soil in grasslands from 35 to 490 feet elevation.	April–May / Annual herb	There is 1 CNDDDB occurrence record of serpentine cryptantha in the study area.	Potential to occur. The Permit Area intersects 1 occurrence of this species, which is believed to have been extirpated. Potential habitat for this species occurs where annual grassland in sandy soil is present in Contra Costa County.
<i>Phacelia insularis</i> var. <i>continentis</i> North Coast phacelia	–/–/1B.2	This species occurs on coastal bluffs, on sandy soil or rock outcrops, below 510 feet elevation.	March–May / Annual herb	There are 6 CNDDDB occurrence records of North Coast phacelia in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Marin County.
<i>Phacelia phacelioides</i> Mt. Diablo phacelia	–/–/1B.2	This species occurs in chaparral, oak woodlands, adjacent to trails, and on rock outcrops and talus slopes from 2,000 to 3,800 feet elevation.	April–May / Annual herb	There are 12 CNDDDB occurrence records of Mt. Diablo phacelia in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where chaparral or oak woodland is present in Contra Costa, Alameda, and Santa Clara Counties.
<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i> Choris’s popcornflower	–/–/1B.2	This species occurs in mesic areas in coastal prairie, coastal scrub, and chaparral from 10 to 525 feet elevation.	March–June / Annual herb	There are 32 CNDDDB occurrence records of Choris’s popcornflower in the study area.	Likely to occur. The Permit Area intersects 14 occurrences of this species. Potential habitat for this species occurs where perennial grassland, coastal scrub, or chaparral is present in San Francisco and San Mateo Counties.

Species Name	Status ^a Federal/State/ CRPR	Habitat Requirements	Flowering Phenology/ Life Form	Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Plagiobothrys chorisianus</i> var. <i>hickmanii</i> Hickman’s popcornflower	–/–/4.2	This species occurs in vernal pools and swales below 655 feet elevation.	April–July / Annual herb	There are 19 herbarium records of Hickman’s popcornflower in the study area.	Potential to occur. Potential habitat for this species is present in San Mateo and Santa Clara County.
<i>Plagiobothrys diffusus</i> San Francisco popcornflower	–/E/1B.1	This species occurs in coastal terrace grasslands below 1,600 feet elevation.	March–June / Annual herb	There are 3 CNDDDB occurrence records of San Francisco popcornflower in the study area.	Absent. The Permit Area intersects 2 occurrences of this species. Both occurrences are extirpated or likely extirpated. Potential habitat for this species occurs where perennial grassland is present in San Francisco County (ICF 2016).
<i>Plagiobothrys glaber</i> Hairless popcornflower	–/–/1A	This species occurs in alkaline meadows from 50 to 590 feet elevation.	April–May / Annual herb	There are 8 CNDDDB occurrence records of hairless popcornflower in the study area.	Potential to occur. The Permit Area intersects 8 occurrences of this species. All of these occurrences are believed to be extirpated. Potential habitat for this species occurs where saline emergent wetland is present in San Francisco County.
<i>Plagiobothrys hystriculus</i> Bearded popcornflower	–/–/1B.1	This species occurs in mesic grasslands and vernal pools below 900 feet elevation.	March–May / Annual herb	There are 13 CNDDDB occurrence records of bearded popcornflower in the study area.	Likely to occur. The Permit Area intersects 10 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Solano and Napa Counties.
<i>Plagiobothrys mollis</i> var. <i>vestitus</i> Petaluma popcornflower	–/–/1A	This species occurs in wet sites in grasslands, possibly near salt marsh from 35 to 165 feet elevation.	June–July / Annual herb	There is 1 CNDDDB occurrence record of Petaluma popcornflower in the study area.	Potential to occur. The Permit Area intersects 1 occurrence of this species. This occurrence is believed to be extirpated. Potential habitat for this species occurs where saline emergent wetland is present in Napa County.
<i>Plagiobothrys strictus</i> Calistoga popcornflower	E/T/1B.1	This species occurs in alkaline areas near thermal springs from 295 to 525 feet elevation.	March–June / Annual herb	There are 3 CNDDDB occurrence records of Calistoga popcornflower in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where wet meadow is present in Napa County (ICF 2016).
<i>Plagiobothrys uncinatus</i> Salinas Valley popcornflower	–/–/1B.2	This species occurs on sandy soils in grasslands, chaparral, and oak woodlands from 985 to 2,395 feet elevation.	April–May / Annual herb	There are no records of Salinas Valley popcornflower in the study area.	Absent. The study area lies outside of the range for Salinas Valley popcornflower.
<i>Plagiobothrys verrucosus</i> Warty popcornflower	–/–/2B.1	This species occurs on gravelly soils in open areas in chaparral from 2,280 to 2,790 feet elevation.	March–May / Annual herb	There are 4 CNDDDB occurrence records of warty popcornflower in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Santa Clara County.
Brassicaceae – Mustard Family					
<i>Arabis blepharophylla</i> Coast rock cress	–/–/4.3	This species occurs in rock outcrops on coastal bluffs and hill slopes from 165 to 985 feet elevation.	February–May / Perennial herb	There are 125 herbarium records of coast rock cress in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub is present in Marin, San Francisco, and San Mateo Counties.
<i>Arabis modesta</i> Modest rock cress	–/–/4.3	This species occurs on steep slopes, cliffs, and shaded canyon ledges from 165 to 1,640 feet elevation.	March–May / Perennial herb	There are 9 herbarium records of modest rock cress in the study area.	Potential to occur. Potential habitat for this species occurs where rock outcrops in oak woodland, chaparral, and closed-cone coniferous woodland are present in Napa and Yolo Counties.
<i>Arabis oregana</i> Oregon rock cress	–/–/4.3	This species occurs in chaparral, on rocky hillsides and steep banks from 1,640 to 4,575 feet elevation.	May / Perennial herb	There are 9 herbarium records of Oregon rock cress in the study area.	Potential to occur. Potential habitat for this species occurs where rock outcrops in chaparral and closed-cone coniferous woodland are present in Napa County.
<i>Boechera rubicundula</i> Mt. Day rockcress	–/–/1B.1	This species occurs in chaparral, on rocky slopes around 3,935 feet elevation.	April–May / Perennial herb	There is 1 CNDDDB occurrence record of Mt. Day rock cress in the study area.	Potential to occur. This species is known from a single occurrence. The Permit Area does not intersect the occurrence. Potential habitat for this species occurs where rock outcrops in chaparral are present in Santa Clara County.
<i>Cardamine angulata</i> Seaside bittercress	–/–/2B.2	This species occurs in riparian areas and on streambanks in North Coast coniferous forest and lower montane coniferous forest from 15 to 1,720 feet elevation.	(January) March–July / Perennial herb	There is 1 CNDDDB occurrence record of seaside bittercress in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where coastal riparian habitat is present in Marin County.
<i>Caulanthus lemmonii</i> Lemmon’s jewelflower	–/–/1B.2	This species occurs in pinyon and juniper woodlands, and valley and foothill grasslands from 260 to 5,185 feet elevation.	February–May / Annual herb	There are 2 CNDDDB occurrence records of Lemmon’s jewelflower in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where annual grassland habitat is present in Alameda County.
<i>Erysimum ammophilum</i> Coast wallflower	–/–/1B.2	This species occurs in coastal dunes and sandy openings in maritime chaparral and coastal scrub below 195 feet elevation.	February–June / Perennial herb	There is 1 CNDDDB occurrence record of coast wallflower in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in southern San Mateo County.

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<i>Erysimum capitatum</i> ssp. <i>angustatum</i> Contra Costa wallflower	E/E/1B.1	This species occurs on inland dunes from 10 to 65 feet elevation.	March–July / Perennial herb	There are 4 CNDDDB occurrence records of Contra Costa wallflower in the study area.	Present. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where dunes are present in Contra Costa County (ICF 2016).
<i>Erysimum concinnum</i> Headland wallflower	–/–/1B.2	This species occurs in coastal bluff scrub, coastal dunes, and coastal prairies below 605 feet elevation.	February–July / Annual / Perennial herb	There are 13 CNDDDB occurrence records of headland wallflower in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where dunes, coastal scrub, and perennial grassland are present in Sonoma, Marin, and San Francisco Counties.
<i>Erysimum franciscanum</i> San Francisco wallflower	–/–/4.2	This species occurs in chaparral, coastal dunes, coastal scrub, and valley and foothill grasslands below 1,805 feet elevation. Substrates are often serpentinitic or granitic, and this species sometimes occurs on roadsides.	March–June / Perennial herb	There are about 125 herbarium records of San Francisco wallflower in the study area.	Potential to occur. Potential habitat for this species occurs where dunes and coastal scrub are present in Marin, San Francisco, and San Mateo Counties.
<i>Lepidium latipes</i> var. <i>heckardii</i> Heckard’s pepper-grass	–/–/1B.2	This species occurs in annual grasslands on the margins of alkali scalds from 5 to 655 feet elevation.	March–May / Annual herb	There are 2 CNDDDB occurrence records of Heckard’s pepper-grass in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where annual grassland in alkaline soils is present in Solano County.
<i>Streptanthus albidus</i> ssp. <i>albidus</i> Metcalf Canyon jewelflower	E/–/1B.1	This species occurs in serpentine grassland from 150 to 2,625 feet elevation.	April–July / Annual herb	There are 13 CNDDDB occurrence records of Metcalf Canyon jewelflower in the study area.	Present. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in Santa Clara County (ICF 2016).
<i>Streptanthus albidus</i> ssp. <i>peramoenus</i> Most beautiful jewelflower	–/–/1B.2	This species occurs on ridges, slopes, and outcrops in serpentine chaparral and grasslands between 450 and 3,200 feet elevation.	April–June / Annual herb	There are 66 CNDDDB occurrence records of most beautiful jewelflower in the study area.	Likely to occur. The Permit Area intersects 27 occurrences of this species. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral are present in Contra Costa, Alameda, and Santa Clara Counties.
<i>Streptanthus barbiger</i> Bearded jewelflower	–/–/4.2	This species occurs in serpentine chaparral and barrens from 255 to 4,920 feet elevation.	May–August / Annual herb	There are about 125 herbarium records of bearded jewelflower in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral are present in Sonoma and Napa Counties.
<i>Streptanthus batrachopus</i> Tamalpais jewelflower	–/–/1B.3	This species occurs on serpentine substrates in chaparral and closed-cone coniferous forest from 1,000 to 2,135 feet elevation.	April–July / Annual herb	There are 8 CNDDDB occurrence records of Tamalpais jewelflower in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and closed-cone coniferous woodland are present in Marin County.
<i>Streptanthus brachiatus</i> ssp. <i>hoffmanii</i> Freed’s jewelflower	–/–/1B.2	This species occurs on serpentine substrates in chaparral from 1,610 to 3,935 feet elevation	May–July / Perennial herb	There are 5 CNDDDB occurrence records of Freed’s jewelflower in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in northern Napa County.
<i>Streptanthus brachiatus</i> ssp. <i>brachiatus</i> Socrates Mine jewelflower	–/–/1B.2	This species occurs on serpentinite substrates in chaparral and cypress forests from 1,790 to 3,280 feet elevation.	May–June / Perennial herb	There are 5 CNDDDB occurrence records of Socrates Mine jewelflower in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma County.
<i>Streptanthus callistus</i> Mt. Hamilton jewelflower	–/–/1B.3	This species occurs in chaparral and oak woodlands from 1,970 to 2,590 feet elevation.	April–May / Annual herb	There are 4 CNDDDB occurrence records of Mt. Hamilton jewelflower in the study area.	Potential to occur. The Permit Area does not intercept any occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and blue oak-foothill pine woodland is present is in Santa Clara County.
<i>Streptanthus glandulosus</i> ssp. <i>hoffmanii</i> Secund jewelflower	–/–/1B.3	This species occurs on serpentine substrates in chaparral and grasslands from 395 to 1,560 feet elevation.	March–July / Annual herb	There are 4 CNDDDB occurrence records of secund jewelflower in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral are present in Sonoma County.
<i>Streptanthus glandulosus</i> ssp. <i>niger</i> Tiburon jewelflower	E/E/1B.1	This species occurs in serpentine grasslands from 100 to 330 feet elevation.	May–July / Annual herb	There are 2 CNDDDB occurrence records of Tiburon jewelflower in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where serpentine grassland is present in Marin County.
<i>Streptanthus glandulosus</i> ssp. <i>pulchellus</i> Mount Tamalpais jewelflower	–/–/1B.2	This species occurs in grasslands and dry, open areas in chaparral and oak woodland, usually on serpentinite, from 490 to 2,625 feet elevation.	May–July / Annual herb	There are 24 CNDDDB occurrence records of Mount Tamalpais jewelflower in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral are present in Marin County.
<i>Streptanthus hesperidis</i> Green jewelflower	–/–/1B.2	This species occurs on serpentine and rocky substrates in chaparral, barrens, and closed-cone coniferous woodlands from 820 to 1,970 feet elevation.	May–July / Annual herb	There are 13 CNDDDB occurrence records of green jewelflower in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where chaparral and closed-cone coniferous woodland are present in Napa and Sonoma Counties.

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<i>Streptanthus hispidus</i> Mt. Diablo jewelflower	-/-/1B.3	This species occurs on rocky outcrops in annual grassland and chaparral from 2,000 to 3,850 feet elevation.	March–June / Annual herb	There are 8 CNDDDB occurrence records of Mt. Diablo jewelflower in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral are present in Contra Costa County.
<i>Streptanthus morrisonii</i> ssp. <i>elatus</i> Three Peaks jewelflower	-/-/1B.2	This species occurs in serpentine chaparral and in barrens from 785 to 2,410 feet elevation.	June–September / Perennial herb	There are 7 CNDDDB occurrence records of Three Peaks jewelflower in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
<i>Streptanthus morrisonii</i> ssp. <i>hirtiflorus</i> Dorr’s Cabin jewelflower	-/-/1B.2	This species occurs on serpentine substrates in chaparral, barrens, and cypress woodlands from 605 to 2,690 feet elevation.	June / Perennial herb	There is 1 CNDDDB occurrence record of Dorr’s cabin jewelflower in the study area.	Potential to occur. The Permit Area does not intercept any occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and closed-cone coniferous woodland are present in Sonoma and Napa Counties.
<i>Streptanthus morrisonii</i> ssp. <i>kruckebergii</i> Kruckeberg’s jewelflower	-/-/1B.2	This species occurs on serpentine substrate in chaparral, barrens, and cypress woodlands from 785 to 2,180 feet elevation.	April–July / Perennial herb	There are 3 CNDDDB occurrence records of Kruckeberg’s jewelflower in the study area.	Potential to occur. The Permit Area does not intercept any occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and closed-cone coniferous woodland are present in Napa County.
<i>Streptanthus morrisonii</i> ssp. <i>morrisonii</i> Morrison’s jewelflower	-/-/1B.2	This species occurs on serpentine substrate in chaparral, barrens, and cypress woodlands from 395 to 1,920 feet elevation.	May–September / Perennial herb	There are 5 CNDDDB occurrence records of Morrison’s jewelflower in the study area.	Potential to occur. The Permit Area does not intercept any occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and closed-cone coniferous woodland are present in Sonoma County.
<i>Thelypodium brachycarpum</i> Short-podded thelypodium	-/-/4.2	This species occurs in meadows and seeps on clay, alkaline, or serpentine soils in chaparral and lower montane coniferous forest from 2,200 to 8,400 feet elevation.	May–August / Perennial herb	There are three herbarium records of short-podded thelypodium in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa and Sonoma Counties.
<i>Tropidocarpum capparideum</i> Caper-fruited tropidocarpum	-/-/1B.1	This species occurs on alkaline soils in valley and foothill grasslands from 5 to 1,460 feet elevation.	March–April / Annual herb	There are 7 CNDDDB occurrence records of caper-fruited tropidocarpum in the study area.	Potential to occur. The Permit Area intersects 7 occurrences of this species. However, all the occurrences are either extirpated or are based on historical records. Potential habitat for this species occurs where annual grassland is present in Alameda and Contra Costa Counties.
Campanulaceae – Bluebell Family					
<i>Downingia pusilla</i> Dwarf downingia	-/-/2B.2	This species occurs in vernal pools below 1,460 feet elevation.	March–May / Annual herb	There are 47 CNDDDB occurrence records of dwarf downingia in the study area.	Likely to occur. The Permit Area intersects 21 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma, Napa, and Solano Counties.
<i>Legenere limosa</i> Legenere	-/-/1B.1	This species occurs in vernal pools below 2,885 feet elevation.	May–June / Annual herb	There are 18 CNDDDB occurrence records of legenere in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma, Napa, and Solano Counties.
Caryophyllaceae – Pink Family					
<i>Arenaria paludicola</i> Marsh sandwort	E/E/1B.1	This species occurs in freshwater marshes and swamps from 10 to 560 feet elevation.	May–August / Perennial herb	There is 1 CNDDDB occurrence record of marsh sandwort in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species; however, this occurrence has been extirpated. Potential habitat for this species occurs where freshwater emergent wetlands are present in San Francisco County (ICF 2016).
<i>Silene verecunda</i> ssp. <i>verecunda</i> San Francisco campion	-/-/1B.2	This species occurs in coastal prairie, coastal scrub, and chaparral from 100 to 2,115 feet elevation.	February–August / Perennial herb	There are 7 CNDDDB occurrence records of San Francisco campion in the study area.	Potential to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where coastal scrub, perennial grasslands, or chaparral are present in San Mateo and San Francisco Counties.
<i>Spergularia macrotheca</i> var. <i>longistyla</i> Long-styled sand-spurry	-/-/1B.2	This species occurs in alkaline grassland, meadows, marshes, mud flats, and hot springs, below 655 feet elevation.	February–May / Perennial herb	There are 22 CNDDDB occurrence records of long-styled sand-spurry in the study area.	Potential to occur. The Permit Area intersects 18 occurrences of this species. Potential habitat for this species occurs where wet meadow is present in alkaline soils in Napa, Solano, Contra Costa, and Alameda Counties.
<i>Stellaria littoralis</i> Beach starwort	-/-/4.2	This species occurs in coastal marshes and bluffs below 130 feet elevation.	March–July / Perennial herb	There are about 33 herbarium records of beach starwort in the study area.	Potential to occur. Potential habitat for this species occurs where high elevation tidal marsh and coastal scrub are present in Sonoma, Marin, and San Francisco Counties.

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Chenopodiaceae – Goosefoot Family					
<i>Atriplex cordulata</i> var. <i>cordulata</i> Heartscale	–/–/1B.2	This species occurs in alkali grassland, alkali meadow, and alkali scrub below 1,835 feet elevation.	May–October / Annual herb	There are 15 CNDDDB occurrence records of heartscale in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools or saline emergent wetlands are present in Solano County.
<i>Atriplex coronata</i> var. <i>coronata</i> Crownscale	–/–/4.2	This species occurs in alkali grassland, alkali meadow, and alkali scrub from 5 to 1,935 feet elevation.	August– September / Annual herb	There are about 33 herbarium records of crownscale in the study area.	Likely to occur. Potential habitat for this species occurs where alkaline vernal pools or saline emergent wetlands are present in Solano, Contra Costa, and Alameda Counties.
<i>Atriplex depressa</i> Brittlescale	–/–/1B.2	This species occurs in alkali grassland, alkali meadow, and alkali scrub from 5 to 1,050 feet elevation.	April–October / Annual herb	There are 26 CNDDDB occurrence records of brittlescale in the study area.	Likely to occur. The Permit Area intersects 16 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools or saline emergent wetlands are present in Solano, Contra Costa, and Alameda Counties.
<i>Atriplex minuscula</i> Lesser saltscale	–/–/1B.1	This species occurs in alkali sink and sandy alkaline soils in grasslands, from 65 to 325 feet elevation.	May–October / Annual herb	There are 4 CNDDDB occurrence records of lesser saltscale in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools or saline emergent wetlands are present in Contra Costa and Alameda Counties.
<i>Atriplex persistens</i> Vernal pool smallscale	–/–/1B.2	This species occurs in the dry beds of vernal pools, on alkaline soils from 30 to 375 feet elevation.	June–October / Annual herb	There are 4 CNDDDB occurrence records of vernal pool smallscale in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools or saline emergent wetlands are present in Solano County.
<i>Extriplex joaquiniana</i> San Joaquin spearscale	–/–/1B.2	This species occurs in alkali meadow, alkali grassland, and saltbush scrub from 5 to 2,740 feet elevation.	April– September / Annual herb	There are 81 CNDDDB occurrence records of San Joaquin spearscale in the study area.	Likely to occur. The Permit Area intersects 47 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools or saline emergent wetlands are present in Napa, Solano, Contra Costa, Alameda, and Santa Clara Counties.
<i>Suaeda californica</i> California seablight	E/–/1B.1	This species occurs on the margins of tidal salt marsh below 50 feet in elevation.	July–October / Perennial shrub	There are 10 CNDDDB occurrence records of California seablight in the study area.	Absent. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Alameda, Santa Clara and San Francisco Counties (ICF 2016).
Convolvulaceae – Morning-Glory Family					
<i>Calystegia collina</i> ssp. <i>oxyphylla</i> Mt. Saint Helena morning-glory	–/–/4.2	This species occurs in open areas in serpentine chaparral from 900 to 3,315 feet elevation.	May–June / Perennial herb	There are about 21 herbarium records of Mt. Saint Helena morning-glory in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma, Napa, and Marin Counties.
<i>Calystegia collina</i> ssp. <i>venusta</i> South Coast Range morning-glory	–/–/4.3	This species occurs in open grassy or rocky places in oak/pine woodlands, often on serpentinite, below 1,970 feet elevation.	April–June / Perennial herb	There are no herbarium or CNDDDB records of South Coast Range morning-glory in the study area.	Unlikely to occur. Although potential habitat for this species occurs where blue oak-foothill pine woodland is present, the study area appears to be outside of the subspecies’ range.
<i>Calystegia purpurata</i> ssp. <i>saxicola</i> Coastal bluff morning-glory	–/–/1B.2	This species occurs in coastal dunes, coastal scrub, coastal bluff scrub, and North Coast coniferous forest below 1,410 feet elevation.	May–June / Perennial herb	There are 30 CNDDDB occurrence records of coastal bluff morning-glory in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in Sonoma and Marin Counties.
<i>Convolvulus simulans</i> Small-flowered morning-glory	–/–/4.2	This species occurs in chaparral openings, coastal scrub, valley and foothill grassland, on clay soils in serpentinite seeps, from 330 to 9,415 feet elevation.	April–June / Annual herb	There are 3 herbarium records of small-flowered morning-glory in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub, chaparral, or grassland is present in Contra Costa County.
<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i> Peruvian dodder	–/–/2B.2	This species occurs in freshwater marshes from 50 to 920 feet elevation.	July–October / Annual parasitic vine	There is 1 CNDDDB occurrence record of Peruvian dodder in the study area.	Likely to occur. The Permit Area intersects 1 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Sonoma County.
<i>Cuscuta pacifica</i> var. <i>papillata</i> Mendocino dodder	–/–/1B.2	This species occurs in coastal dunes and interdune depressions below 165 feet elevation.	June–October / Annual parasitic vine	There is 1 CNDDDB occurrence records of Mendocino dodder in the study area.	Likely to occur. The Permit Area intersects 1 occurrences of this species. Potential habitat for this species occurs where dunes are present in Sonoma County.
<i>Dichondra occidentalis</i> Western dichondra	–/–/4.2	This species occurs at the base of rocks and shrubs in coastal scrub, chaparral, and oak woodlands below 1,705 feet elevation.	March–June / Perennial herb	There are 3 herbarium records of western dichondra in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub, chaparral, or oak woodland are present in Sonoma and Marin Counties.

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Crassulaceae – Stonecrop Family					
<i>Dudleya abramsii</i> ssp. <i>setchellii</i> Santa Clara Valley dudleya	E/-/1B.1	This species occurs on serpentinite in grasslands, oak woodlands from 195 to 1,495 feet elevation.	April–June / Perennial herb	There are 58 CNDDDB occurrence records of Santa Clara Valley dudleya in the study area.	Present. The Permit Area intersects 23 occurrences of this species. Potential habitat for this species occurs where serpentine grassland or oak woodland are present in Santa Clara County (ICF 2016).
Cupressaceae – Cypress Family					
<i>Hesperocyparis abramsiana</i> var. <i>butano</i> Butano Ridge cypress	-/-/1B.2	This species occurs in closed-cone coniferous forests on sandstone-derived soils from 1,310 to 1,610 feet elevation.	October / Perennial evergreen tree	There is 1 CNDDDB occurrence record of Butano Ridge cypress in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where closed-cone cypress-pine forest is present in San Mateo County.
<i>Hesperocyparis pygmaea</i> Mendocino cypress	-/-/1B.2	This species occurs in closed-cone pine-cypress forest from 100 to 1,970 feet elevation.	October / Perennial evergreen tree	There are 2 CNDDDB occurrence records of Mendocino cypress in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where closed-cone cypress-pine forest is present in Sonoma County.
Cyperaceae – Sedge Family					
<i>Carex albida</i> White sedge	E/E/1B.1	This species occurs in freshwater marsh at about 145 feet elevation.	May–July / Perennial herb	There are 2 herbarium records of white sedge in the study area.	Potential to occur. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma County. White sedge is no longer considered to be a valid species and has been dropped from the CNDDDB.
<i>Carex buxbaumii</i> Buxbaum’s sedge	-/-/4.2	This species occurs in fens, wet meadows, seeps, marshes, and swamps below 10,825 feet elevation.	March–August / Perennial herb	Based on herbarium records, there are 3 occurrences of Buxbaum’s sedge in the study area.	Potential to occur. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma and Marin Counties.
<i>Carex comosa</i> Bristly sedge	-/-/2B.1	This species occurs on lake margins below 2,050 feet elevation.	May–September / Perennial herb	There are 4 CNDDDB occurrence records of bristly sedge in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma County.
<i>Carex leptalea</i> Flaccid sedge	-/-/2B.2	This species occurs in bogs and wet meadows, below 4,250 feet elevation.	June–August / Perennial herb	There is 1 CNDDDB occurrence record of flaccid sedge in the study area.	Potential to occur. The Permit Area intersects 1 occurrence of this species. Although potential habitat for this species occurs where freshwater emergent wetlands are present in Marin County, the Marin County occurrence appears to be extirpated.
<i>Carex lyngbyei</i> Lyngbye’s sedge	-/-/2B.2	This species occurs in salt marshes, freshwater marshes, and sphagnum bogs below 35 feet elevation.	April–August / Perennial herb	There are 5 CNDDDB occurrence records of Lyngbye’s sedge in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh or freshwater emergent wetlands are present in Sonoma, Marin, and Napa Counties.
<i>Carex praticola</i> Mountain meadow sedge	-/-/2B.2	This species occurs in wet meadows and seeps from 50 to 10,500 feet elevation.	May–July / Perennial herb	There is 1 CNDDDB occurrence record of mountain meadow sedge in the study area.	Potential to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Napa, Sonoma, and Marin Counties.
<i>Carex saliniformis</i> Deceiving sedge	-/-/1B.2	This species occurs in meadows and seeps, coastal salt marsh, coastal swamp, and wet areas in coastal prairie and coastal scrub below 760 feet elevation.	June–July / Perennial herb	There are 3 CNDDDB occurrence records of deceiving sedge in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma County.
<i>Eleocharis parvula</i> Small spikerush	-/-/4.3	This species occurs in coastal brackish wetlands below 165 feet elevation.	Late winter–fall / Perennial herb	Based on herbarium records, there are 5 occurrences of small spikerush in the study area.	Potential to occur. Potential habitat for this species occurs where high elevation tidal marsh is present in Napa, Sonoma, Marin, and Alameda Counties.
<i>Eriophorum gracile</i> Slender cottongrass	-/-/4.3	This species occurs in wet meadows and bogs from 1,970 to 9,515 feet elevation.	May–July / Perennial herb	There are no herbarium or CNDDDB records of slender cottongrass in the study area.	Unlikely to occur. Potential habitat for this species occurs where high elevation bogs and wet meadows are present. The study area is outside of the range for this species, and the reported occurrence location in the CNPS Inventory is most likely erroneous.
<i>Rhynchospora alba</i> White beaked-rush	-/-/2B.2	This species occurs in meadows, marshes, and bogs from 195 to 6,695 feet elevation.	July–August / Perennial herb	There is 1 CNDDDB occurrence record of white beaked-rush in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma County.
<i>Rhynchospora californica</i> California beaked-rush	-/-/1B.1	This species occurs in freshwater marshes and seeps from 150 to 3,315 feet elevation.	May–July / Perennial herb	There are 5 CNDDDB occurrence records of California beaked-rush in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Napa, Sonoma, and Marin Counties.

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<i>Rhynchospora capitellata</i> Brownish beaked-rush	-/-/2B.2	This species occurs in freshwater marshes and seeps from 150 to 6,560 feet elevation.	July–August / Perennial herb	There are 2 CNDDDB occurrence records of brownish beaked-rush in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma County.
<i>Rhynchospora globularis</i> Round-headed beaked-rush	-/-/2B.1	This species occurs in freshwater marsh from 150 to 195 feet elevation.	July–August / Perennial herb	There are 2 CNDDDB occurrence records of round-headed beaked-rush in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Sonoma County.
Equisetaceae – Horsetail Family					
<i>Equisetum palustre</i> Marsh horsetail	-/-/3	This species occurs in freshwater marsh, below 985 feet elevation.	NA (No flower) / Perennial herb	Based on herbarium records, there is 1 occurrence of marsh horsetail in the study area.	Potential to occur. Potential habitat for this species occurs where freshwater emergent wetlands are present in San Francisco County.
Ericaceae – Heath Family					
<i>Arctostaphylos andersonii</i> Santa Cruz manzanita	-/-/1B.2	This species occurs in chaparral and on the edges of broadleaved upland forest and north coast coniferous forest from 195 to 2,495 feet elevation.	November– April / Perennial shrub	There are 23 CNDDDB occurrence records of Santa Cruz manzanita in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Santa Clara and San Mateo Counties.
<i>Arctostaphylos auriculata</i> Mt. Diablo manzanita	-/-/1B.3	This species occurs on sandstone in chaparral, in canyons and on slopes from 400 to 1,650 feet elevation.	January–March / Perennial shrub	There are 17 CNDDDB occurrence records of Mt. Diablo manzanita in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Contra Costa County.
<i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i> Baker’s manzanita	-/R/1B.1	This species occurs in broadleaved upland forest, chaparral, often on serpentine soils, from 245 to 985 feet elevation.	April–May / Perennial shrub	There are 3 CNDDDB occurrence records of Baker’s manzanita in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma County (ICF 2016).
<i>Arctostaphylos bakeri</i> ssp. <i>sublaevis</i> The Cedars manzanita	-/R/1B.2	This species occurs on serpentinite in closed-cone coniferous forests and chaparral from 605 to 2,495 feet elevation.	April–May / Perennial shrub	There are 4 CNDDDB occurrence records of The Cedars manzanita in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and closed-cone pine-cypress forest are present in Sonoma County (ICF 2016).
<i>Arctostaphylos densiflora</i> Vine Hill manzanita	-/E/1B.1	This species occurs, on acidic sandy soils derived from marine sediments in chaparral from 165 to 395 feet elevation.	February– March / Perennial shrub	There are 2 CNDDDB occurrence records of Vine Hill manzanita in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Sonoma County (ICF 2016).
<i>Arctostaphylos franciscana</i> Franciscan manzanita	-/-/1B.1	This species occurs on serpentinite in coastal scrub from 195 to 985 feet elevation.	February–April / Perennial shrub	There are 4 CNDDDB occurrence records of Franciscan manzanita in the study area.	Unlikely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in San Francisco County. Of the known occurrences, 3 are extirpated, and the remaining occurrence is protected in a native plant management area.
<i>Arctostaphylos hispidula</i> Howell’s manzanita	-/-/4.2	This species occurs on serpentinite or sandstone substrates in chaparral or woodlands from 330 to 4,100 feet elevation.	March–April / Perennial shrub	Based on herbarium records, there are 8 occurrences of Howell’s manzanita in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral is present in Sonoma County.
<i>Arctostaphylos imbricata</i> San Bruno Mountain manzanita	-/E/1B.1	This species occurs in chaparral from 900 to 1,215 feet elevation.	February–May / Perennial shrub	There are 2 CNDDDB occurrence records of San Bruno Mountain manzanita in the study area.	Present. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in San Mateo County (ICF 2016).
<i>Arctostaphylos manzanita</i> ssp. <i>elegans</i> Konocti manzanita	-/-/1B.3	This species occurs on volcanic soils in chaparral, oak woodland, and lower montane coniferous forest from 740 to 6,005 feet elevation.	February–May / Perennial shrub	There are 5 CNDDDB occurrence records of Konocti manzanita in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Napa and Sonoma Counties.
<i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i> Contra Costa manzanita	-/-/1B.2	This species occurs in chaparral from 490 to 2,000 feet elevation.	January– February / Perennial shrub	There are 10 CNDDDB occurrence records of Contra Costa manzanita in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Contra Costa County.
<i>Arctostaphylos montana</i> ssp. <i>montana</i> Mt. Tamalpais manzanita	-/-/1B.3	This species occurs on serpentine soil in chaparral and grasslands from 525 to 2,500 feet elevation.	February–April / Perennial shrub	There are 15 CNDDDB occurrence records of Mt. Tamalpais manzanita in the study area.	Likely to occur. The Permit Area intersects 10 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Marin County.
<i>Arctostaphylos montana</i> ssp. <i>ravenii</i> Presidio manzanita	E/E/1B.1	This species occurs on serpentinite in coastal scrub from 150 to 705 feet elevation.	February– March / Perennial shrub	There are 7 CNDDDB occurrence records of Presidio manzanita in the study area.	Absent. The Permit Area intersects 5 occurrences of this species but not present in ROW. Potential habitat for this species occurs where serpentine chaparral is present in San Francisco County (ICF 2016).

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<i>Arctostaphylos montaraensis</i> Montara manzanita	-/-/1B.2	This species occurs in maritime chaparral and coastal scrub from 260 to 1,640 feet elevation.	January–March / Perennial shrub	There are 4 CNDDDB occurrence records of Montara manzanita in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where coastal scrub or mixed chaparral is present in San Mateo County.
<i>Arctostaphylos pacifica</i> Pacific manzanita	-/E/1B.1	The species is known only from San Bruno Mountain.	February–April / Perennial shrub	There is 1 CNDDDB occurrence record of Pacific manzanita in the study area.	Absent. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in San Mateo County (ICF 2016).
<i>Arctostaphylos pallida</i> Pallid manzanita	T/E/1B.1	This species occurs on slopes and ridges on siliceous shales in northern maritime chaparral and mixed evergreen forest from 600 to 1,530 feet elevation.	December–March / Perennial shrub	There are 9 CNDDDB occurrence records of pallid manzanita in the study area.	Present. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Alameda County (ICF 2016).
<i>Arctostaphylos regismontana</i> Kings Mountain manzanita	-/-/1B.2	This species occurs on granitic or sandstone outcrops in broadleaved upland forests, chaparral, and north coast coniferous forests from 1,000 to 2,395 feet elevation.	January–March / Perennial shrub	There are 16 CNDDDB occurrence records of Kings Mountain manzanita in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where mixed chaparral or montane hardwood-conifer forest is present in San Mateo County.
<i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> Rincon manzanita	-/-/1B.1	This species occurs on rhyolitic soils in chaparral from 245 to 1,215 feet elevation.	February–April / Perennial shrub	There are 12 CNDDDB occurrence records of Rincon manzanita in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Napa and Sonoma Counties.
<i>Arctostaphylos virgata</i> Marin manzanita	-/-/1B.2	This species occurs on sandstone or granite substrates in chaparral, Bishop pine forests, broadleaved upland forests, and north coast coniferous forests from 200 to 2,300 feet elevation.	January–March / Perennial shrub	There are 32 CNDDDB occurrence records of Marin manzanita in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral or closed-cone pine-cypress forest is present in Marin County.
<i>Pityopus californicus</i> California pinefoot	-/-/4.2	This species occurs in mixed evergreen forest and coniferous forest below 5,905 feet elevation.	May–July / Perennial herb	Based on herbarium records, there are 5 occurrences of California pinefoot in the study area.	Potential to occur. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Sonoma and Marin Counties.
Fabaceae – Pea Family					
<i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo	-/-/1B.2	This species occurs in openings in broadleaved upland forest, cismontane woodland, and chaparral from 500 to 6,580 feet elevation.	April–July / Perennial shrub	There are 68 CNDDDB occurrence records of Napa false indigo in the study area.	Likely to occur. The Permit Area intersects 36 occurrences of this species. Potential habitat for this species occurs where mixed chaparral, oak woodland, or montane hardwood-conifer forest are present in Napa, Sonoma, and Marin Counties.
<i>Astragalus breweri</i> Brewer’s milkvetch	-/-/4.2	This species occurs on open slopes in grasslands below 2,970 feet elevation.	March–June / Annual herb	Based on herbarium records, there are as many as 20 occurrences of Brewer’s milkvetch in the study area.	Present. Potential habitat for this species occurs where serpentine chaparral or alkali meadow is present in the Permit Area in Napa, Sonoma, and Marin Counties (ICF 2016).
<i>Astragalus clarianus</i> Clara Hunt’s milkvetch	E/T/1B.1	This species occurs on thin volcanic or serpentine soils in serpentine grasslands and open grassy areas in oak woodland from 230 to 900 feet elevation.	March–April / Annual herb	There are 6 CNDDDB occurrence records of Clara Hunt’s milkvetch in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Napa, Sonoma, and Marin Counties (ICF 2016).
<i>Astragalus clevelandii</i> Cleveland’s milkvetch	-/-/4.3	This species occurs on serpentinite in meadows, seeps, and streambanks from 330 to 4,920 feet elevation.	June–September / Perennial herb	Based on herbarium records, there are about 10 occurrences of Cleveland’s milkvetch in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa and Sonoma Counties.
<i>Astragalus nuttallii</i> var. <i>nuttallii</i> Nuttall’s milkvetch	-/-/4.2	This species occurs in coastal bluffs and dunes, in rocky or sandy areas below 820 feet elevation.	January–December / Perennial herb	Based on herbarium records, there are 4 occurrences of Nuttall’s milkvetch in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub is present in Marin, San Francisco, San Mateo, and Alameda Counties.
<i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i> Coastal marsh milkvetch	-/-/1B.2	This species occurs in moist sites and along streams in coastal dunes and coastal salt marsh below 100 feet elevation.	April–October / Perennial herb	There are 21 CNDDDB occurrence records of coastal marsh milkvetch in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in Napa County.
<i>Astragalus rattanii</i> var. <i>jepsonianus</i> Jepson’s milkvetch	-/-/1B.2	This species occurs on serpentine soils in grasslands and open grassy areas in chaparral from 970 to 2,295 feet elevation.	April–June / Perennial herb	There are 7 CNDDDB occurrence records of Jepson’s milkvetch in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in Marin and San Mateo Counties.
<i>Astragalus rattanii</i> var. <i>rattanii</i> Rattan’s milkvetch	-/-/4.3	This species occurs on riverbanks and sandbars from 165 to 4,920 feet elevation.	April–July / Perennial herb	There are no herbarium or CNDDDB records of this species in the study area.	Absent. The study area is outside of the range for this species, and the reported occurrence location in the CNPS Inventory is most likely erroneous.

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<i>Astragalus tener</i> var. <i>ferrisiae</i> Ferris' milkvetch	-/-/1B.1	This species occurs in subalkaline flats and flood lands, usually on adobe soil, from 5 to 245 feet elevation.	April–May / Annual herb	There are 2 CNDDDB occurrence records of Ferris’ milkvetch in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools are present in Solano County.
<i>Astragalus tener</i> var. <i>tener</i> Alkali milkvetch	-/-/1B.2	This species occurs in grassy flats and vernal pool margins, on alkali soils from 5 to 195 feet elevation.	March–June / Annual herb	There are 44 CNDDDB occurrence records of alkali milkvetch in the study area.	Likely to occur. The Permit Area intersects 31 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools are present in Napa, Solano, Contra Costa, Alameda, and Santa Clara Counties.
<i>Hoita strobilina</i> Loma Prieta hoita	-/-/1B.1	This species occurs on serpentinite in oak woodland, riparian woodland, and chaparral from 100 to 2,820 feet elevation.	May–October / Perennial herb	There are 34 CNDDDB occurrence records of Loma Prieta hoita in the study area.	Likely to occur. The Permit Area intersects 11 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral and annual grasslands are present in Contra Costa, Alameda, and Santa Clara Counties.
<i>Hosackia gracilis</i> Harlequin lotus	-/-/4.2	This species occurs in wet meadows and other wet habitats below 2,295 feet elevation.	March–July / Perennial	There are about 32 herbarium records of harlequin lotus in the study area.	Potential to occur. Potential habitat for this species occurs where wet meadow is present in Sonoma, Marin, San Francisco, and San Mateo Counties.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tule pea	-/-/1B.2	This species occurs in freshwater and brackish marshes and swamps below 15 feet elevation.	May–June / Perennial herb	There are 95 CNDDDB occurrence records of Delta tule pea in the study area.	Likely to occur. The Permit Area intersects 27 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Napa, Solano, and Contra Costa Counties.
<i>Lathyrus palustris</i> Marsh pea	-/-/2B.2	This species occurs in coastal freshwater wetlands from 5 to 460 feet elevation.	May–August / Perennial herb	There are 2 CNDDDB occurrence records of marsh pea in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Sonoma County.
<i>Lupinus arboreus</i> var. <i>eximius</i> San Mateo tree lupine	-/-/3.2	This species occurs in coastal scrub below 3,705 feet elevation.	April–July / Perennial herb	Based on herbarium records, there are 5 occurrences of San Mateo tree lupine in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub is present in Sonoma, Marin, and San Mateo Counties.
<i>Lupinus sericatus</i> Cobb Mountain lupine	-/-/1B.2	This species occurs on gravelly soils in open wooded slopes and knobcone pine-oak woodlands, from 900 to 5,005 feet elevation.	March–June / Perennial herb	There are 37 CNDDDB occurrence records of Cobb Mountain lupine in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where closed-cone pine-cypress forest is present in Napa and Sonoma Counties.
<i>Lupinus tidestromii</i> Tidestrom’s lupine	E/E/1B.1	This species occurs in coastal dunes and coastal dune scrub below 330 feet elevation.	May–June / Perennial herb	There are 37 CNDDDB occurrence records of Tidestrom’s lupine in the study area.	Absent. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in Sonoma and Marin Counties (ICF 2016).
<i>Trifolium amoenum</i> Showy rancheria clover	E/-/1B.1	This species occurs in low elevation grasslands, including swales and disturbed areas, from 15 to 1,360 feet elevation.	April–June / Annual herb	There are 26 CNDDDB occurrence records of showy rancheria clover in the study area.	Absent. The Permit Area intersects 24 occurrences of this species. Potential habitat for this species occurs where annual grasslands is present in Napa, Sonoma, Marin, San Mateo, and Solano Counties. Almost all occurrences appear to be extirpated (ICF 2016).
<i>Trifolium buckwestiorum</i> Santa Cruz clover	-/-/1B.1	This species occurs in coastal prairie, broadleaved upland forest, and cismontane woodland from 345 to 2,000 feet elevation.	May–October / Annual herb	There are 6 CNDDDB occurrence records of Santa Cruz clover in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where annual grasslands in montane hardwood-conifer forest are present in Sonoma County.
<i>Trifolium hydrophilum</i> Saline clover	-/-/1B.2	This species occurs in salt marshes, mesic alkaline areas in grasslands, and vernal pools, below 990 feet elevation.	April–June / Annual herb	There are 32 CNDDDB occurrence records of saline clover in the study area.	Likely to occur. The Permit Area intersects 28 occurrences of this species. Potential habitat for this species occurs where vernal pools and annual grasslands on alkaline soils are present in the study area.
Fagaceae – Beech Family					
<i>Quercus parvula</i> var. <i>tamalpaisensis</i> Tamalpais oak	-/-/1B.3	This species occurs in lower montane coniferous forest from 330 to 2,460 feet elevation.	March–April / Perennial shrub	There are 9 CNDDDB occurrence records of Tamalpais oak in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Marin County.
Grossulariaceae – Gooseberry Family					
<i>Ribes victoris</i> Victor’s gooseberry	-/-/4.3	This species occurs in shaded, mesic areas in broadleafed upland forest and chaparral from 330 to 2,460 feet elevation.	March–April / Perennial shrub	There are about 83 herbarium records of Victor’s gooseberry in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral and montane hardwood-conifer forest are present in the study area.
Iridaceae – Iris Family					
<i>Iris longipetala</i> Coast iris	-/-/4.2	This species occurs in coastal prairie and open areas in coastal forest, below 1,970 feet elevation.	March–June / Perennial herb	There are about 85 herbarium records of coast iris in the study area.	Potential to occur. Potential habitat for this species occurs where perennial grassland is present in the study area.

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Juglandaceae – Walnut Family					
<i>Juglans hindsii</i> Northern California black walnut	–/–/1B.1	This species occurs in riparian forest and riparian woodland below 1,445 feet elevation.	April–May / Perennial tree	There are 4 CNDDDB occurrence records of black walnut in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where valley-foothill riparian forest is present in Napa, Solano, and Contra Costa Counties.
Juncaceae – Rush Family					
<i>Juncus luciensis</i> Santa Lucia dwarf rush	–/–/1B.2	This species occurs in wet meadows, vernal pools, seeps, and along streambanks from 985 to 6,250 feet elevation.	April–August / Annual herb	There is 1 CNDDDB occurrence record of Santa Lucia dwarf rush in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where vernal pools or freshwater emergent wetlands are present in the study area.
Lamiaceae – Mint Family					
<i>Acanthomintha duttonii</i> San Mateo thornmint	E/E/1B.1	This species occurs on serpentine clay soils in annual grasslands and open areas in chaparral and coastal scrub from 165 to 985 feet elevation.	April–June / Annual herb	There are 5 CNDDDB occurrence records of San Mateo thornmint in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in San Mateo County (ICF 2016).
<i>Acanthomintha lanceolata</i> Santa Clara thornmint	–/–/4.2	This species occurs on rocky slopes, outcrops, and talus in woodlands and chaparral below 3,935 feet elevation.	March–June / Annual herb	Based on herbarium records, there are about 18 occurrences of Santa Clara thornmint in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or oak woodland is present in Alameda and Santa Clara Counties.
<i>Monardella antonina</i> ssp. <i>antonina</i> San Antonio Hills monardella	–/–/3	This species occurs in oak woodland from 1,050 to 3,280 feet elevation.	June–August / Perennial herb	There are no herbarium or CNDDDB records of San Antonio Hills monardella in the study area.	Unlikely to occur. Potential habitat for this species occurs where chaparral or oak woodland is present in Contra Costa, Alameda, and Santa Clara Counties. The CNPS reports of occurrences in the study area are possibly erroneous.
<i>Monardella sinuata</i> ssp. <i>nigrescens</i> Northern curly-leaved monardella	–/–/1B.2	This species occurs on sandy soils in coastal dunes, coastal scrub, chaparral, and lower montane coniferous forest below 985 feet elevation.	April– September / Annual herb	There are 13 CNDDDB occurrence records of northern curly-leaved monardella in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where dunes, coastal scrub, mixed chaparral, and montane hardwood-conifer forest are present in Marin County.
<i>Monardella viridis</i> ssp. <i>viridis</i> Green monardella	–/–/4.3	This species occurs in chaparral, oak woodland, and conifer forest from 490 to 2,625 feet elevation.	June–September / Perennial herb	Based on herbarium records, there are about 18 occurrences of green monardella in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral, oak woodland and montane hardwood-conifer forest is present in Sonoma and Napa Counties.
<i>Scutellaria galericulata</i> Marsh skullcap	–/–/2B.2	This species occurs in marshes, meadows, and seeps below 6,890 feet elevation.	June–September / Perennial herb	There is 1 CNDDDB occurrence record of marsh skullcap in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Contra Costa County.
<i>Trichostema ruygtii</i> Napa bluecurls	–/–/1B.2	This species occurs on rocky, volcanic soils in grassland and grassy openings in chaparral, woodlands, and ponderosa pine forests from 100 to 2,230 feet elevation.	June–October / Annual herb	There are 18 CNDDDB occurrence records of Napa bluecurls in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Napa County.
Liliaceae – Lily Family					
<i>Calochortus pulchellus</i> Mt. Diablo fairy lantern	–/–/1B.2	This species occurs in cismontane woodland and chaparral from 100 to 2,755 feet elevation.	April–June / Perennial herb	There are 52 CNDDDB occurrence records of Mt. Diablo fairy lantern in the study area.	Likely to occur. The Permit Area intersects 13 occurrences of this species. Potential habitat for this species occurs where mixed chaparral and montane hardwood-conifer forest is present in Contra Costa and Alameda Counties.
<i>Calochortus raichei</i> The Cedars globe-lily	–/–/1B.2	This species occurs on serpentinite barrens, outcrops, and talus slopes in chaparral, Sargent cypress forest from 655 to 1,610 feet elevation.	May–August / Perennial herb	There are 9 CNDDDB occurrence records of The Cedars globe-lily in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where closed-cone pine-cypress forest is present in Sonoma County.
<i>Calochortus tiburonensis</i> Tiburon mariposa lily	T/T/1B.1	This species occurs in serpentine grasslands from 165 to 330 feet elevation.	May–June / Perennial herb	There is 1 CNDDDB occurrence record of Tiburon mariposa lily in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where serpentine grassland is present in Marin County (ICF 2016).
<i>Calochortus umbellatus</i> Oakland star-tulip	–/–/4.2	This species occurs in open areas in chaparral and oak woodland, on serpentinite, from 330 to 2,295 feet elevation.	March–May / Perennial herb	There are over 100 herbarium records of Oakland star-tulip in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland is present in the study area.
<i>Calochortus uniflorus</i> Large-flowered mariposa lily	–/–/4.2	This species occurs in moist meadows below 1,640 feet elevation.	April–June / Perennial herb	There are about 45 herbarium records of large-flowered mariposa lily in the study area.	Potential to occur. Potential habitat for this species occurs where wet meadow is present in the study area.

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<i>Erythronium helenae</i> St. Helena fawn lily	-/-/4.2	This species occurs on serpentine soils in chaparral, woodland, and forest from 985 to 3,920 feet elevation.	March–May / Perennial herb	There are about 28 herbarium records of St. Helena fawn lily in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in the study area.
<i>Erythronium revolutum</i> Coast fawn lily	-/-/2B.2	This species occurs in broadleafed upland forest, North Coast coniferous forest, and mesic sites and on streambanks from 195 to 4,610 feet elevation.	March–July / Perennial herb	There are no herbarium or CNDDDB records coast fawn lily in the study area.	Potential to occur. Although the study area appears to be outside of the range of this species, the CNPS Inventory reports that this species has been observed in Sonoma County.
<i>Fritillaria agrestis</i> Stinkbells	-/-/4.2	This species occurs in grasslands, foothill woodlands, and open grassy areas in chaparral from 30 to 5,100 feet elevation.	March–June / Perennial herb	There are 15 herbarium records of stinkbells in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland is present in Contra Costa, Alameda, and San Mateo Counties.
<i>Fritillaria biflora</i> var. <i>ineziana</i> Hillsborough chocolate lily	-/-/1B.1	This species occurs in serpentine grasslands at about 500 feet elevation.	March–April / Perennial herb	There are 2 CNDDDB records of Hillsborough chocolate lily in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in San Mateo County.
<i>Fritillaria falcata</i> Talus fritillary	-/-/1B.2	This species occurs on serpentine talus in chaparral, oak woodland, and coniferous forest from 985 to 5,005 feet elevation.	March–May / Perennial herb	There are 8 CNDDDB records of talus fritillary lily in the study area.	Likely to occur. The Permit Area intersects 1 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Alameda and Santa Clara Counties.
<i>Fritillaria lanceolata</i> var. <i>tristulis</i> Marin checker lily	-/-/1B.1	This species occurs in canyons and streambanks in coastal prairie, coastal scrub, coastal bluffs, often on serpentinite, from 50 to 500 feet elevation.	February–May / Perennial herb	There are 32 CNDDDB records of Marin checker lily in the study area.	Likely to occur. The Permit Area intersects 11 occurrences of this species. Potential habitat for this species occurs where coastal scrub and perennial grassland are present in Marin County.
<i>Fritillaria liliacea</i> Fragrant fritillary	-/-/1B.2	This species occurs in coastal scrub, coastal prairie, annual grassland, often on serpentine soils, below 1,350 feet elevation.	February–April / Perennial herb	There are 75 CNDDDB records of fragrant fritillary in the study area.	Likely to occur. The Permit Area intersects 41 occurrences of this species. Potential habitat for this species occurs where serpentine grassland and serpentine chaparral are present in the study area.
<i>Fritillaria pluriflora</i> Adobe lily	-/-/1B.2	This species occurs on adobe soil in foothill and valley grasslands from 195 to 2,295 feet elevation.	February–April / Perennial herb	There are 15 CNDDDB records of adobe lily in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Napa County.
<i>Fritillaria purdyi</i> Purdy’s fritillary	-/-/4.3	This species occurs in open areas in serpentine chaparral, woodlands from 1,310 to 6,875 feet elevation.	March–June / Perennial herb	There are about 11 herbarium records of Purdy’s fritillary in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
<i>Fritillaria roderickii</i> Roderick’s fritillary	-/-/1B.1	This species occurs in coastal scrub and perennial grassland from 50 to 1,310 feet elevation.	March–May / Perennial herb	There is 1 CNDDDB records of Roderick’s fritillary in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where perennial grassland is present in Sonoma County.
<i>Lilium maritimum</i> Coast lily	-/-/1B.1	This species occurs in wet areas in closed-cone pine-cypress forest, coastal scrub, and perennial grassland, often in roadside ditches from 33 to 1,560 feet elevation.	May–July / Perennial herb	There are 12 CNDDDB records of coast lily in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Sonoma and Marin Counties.
<i>Lilium pardalinum</i> ssp. <i>pitkinense</i> Pitkin Marsh lily	E/E/1B.1	This species occurs in freshwater marsh from 115 to 215 feet elevation.	June–July / Perennial herb	There are 4 CNDDDB records of Pitkin Marsh lily in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Sonoma County.
<i>Lilium rubescens</i> Redwood lily	-/-/4.2	This species occurs in chaparral and open areas in coniferous forest from 100 to 5,905 feet elevation.	May–August / Perennial herb	Based on herbarium records, there are 13 occurrences of redwood lily in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or redwood forest are present in Sonoma and Napa Counties.
Limnanthaceae – Meadowfoam Family					
<i>Limnanthes douglasii</i> ssp. <i>ornduffii</i> Ornduff’s meadowfoam	-/-/1B.1	This species occurs in agricultural fields, meadows, and seeps from 35 to 65 feet elevation.	November–May / Annual herb	There are 2 CNDDDB records of Ornduff’s meadowfoam in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in San Mateo County.
<i>Limnanthes douglasii</i> ssp. <i>sulphurea</i> Point Reyes meadowfoam	-/E/1B.2	This species occurs in wet meadows and vernal pools below 460 feet elevation.	April–May / Annual herb	There are 12 CNDDDB records of Point Reyes meadowfoam in the study area.	Present. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Marin and San Mateo Counties (ICF 2016).
<i>Limnanthes floccosa</i> ssp. <i>floccosa</i> Woolly meadowfoam	-/-/4.2	This species occurs in vernal pools and swales from 195 to 4,380 feet elevation.	March–May / Annual herb	Based on herbarium records, there are 3 occurrences of woolly meadowfoam in the study area.	Likely to occur. Potential habitat for this species occurs where vernal pools and swales are present in Napa County.

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<i>Limnanthes vinculans</i> Sebastopol meadowfoam	E/E/1B.1	This species occurs in vernal pools and wet meadows from 50 to 1,000 feet elevation.	April–May / Annual herb	There are 45 CNDDDB records of Sebastopol meadowfoam in the study area.	Present. The Permit Area intersects 23 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma and Napa Counties (ICF 2016).
Linaceae – Flax Family					
<i>Hesperolinon bicarpellatum</i> Two-carpellate western flax	–/–/1B.2	This species occurs in serpentine chaparral from 195 to 3,295 feet elevation.	May–July / Annual herb	There are 4 CNDDDB records of two-carpellate western flax in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa and Sonoma Counties.
<i>Hesperolinon breweri</i> Brewer’s western flax	–/–/1B.2	This species occurs on serpentine slopes in chaparral and grasslands from 100 to 3,085 feet elevation.	May–July / Annual herb	There are 25 CNDDDB records of Brewer’s western flax in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where serpentine grassland or serpentine chaparral is present in Sonoma, Napa, Solano, Contra Costa, and Alameda Counties.
<i>Hesperolinon congestum</i> Marin western flax	T/T/1B.1	This species occurs in serpentine grassland from 15 to 1,215 feet elevation.	April–July / Annual herb	There are 27 CNDDDB records of Marin western flax in the study area.	Present. The Permit Area intersects 14 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in Marin, San Francisco, and San Mateo Counties (ICF 2016).
<i>Hesperolinon drymarioides</i> Drymaria-like western flax	–/–/1B.2	This species occurs on serpentine soil in chaparral and McNab cypress forest from 330 to 3,705 feet elevation.	May–August / Annual herb	There are 3 CNDDDB records of drymaria-like western flax in the study area.	Potential to occur. The Permit Area does not intercept any occurrences of this species. Potential habitat for this species occurs where serpentine grassland or closed-cone pine-cypress forest is present.
<i>Hesperolinon sharsmithiae</i> Sharsmith’s western flax	–/–/1B.2	This species occurs on serpentine soil in chaparral from 590 to 2,200 feet elevation.	May–July / Annual herb	There are 29 CNDDDB records of Sharsmith’s western flax in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
Lycopodiaceae – Club-Moss Family					
<i>Lycopodium clavatum</i> Running pine	–/–/4.1	This species occurs in marshes and wet areas in North Coast coniferous forest from 150 to 4,020 feet elevation.	N/A / Perennial herb	There is 1 CNDDDB record of running pine in the study area.	Potential to occur. The Permit Area does not intercept any occurrences of this species. Potential habitat for this species occurs where redwood forest or montane hardwood-conifer forest is present.
Malvaceae – Mallow Family					
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i> Rose-mallow	–/–/1B.2	This species occurs in freshwater marsh along rivers and sloughs below 395 feet elevation.	August–September / Perennial herb	There are 39 CNDDDB records of rose-mallow in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Solano and Contra Costa Counties.
<i>Malacothamnus aboriginum</i> Indian Valley bush mallow	–/–/1B.2	This species occurs on granitic outcrops and sand in chaparral and oak woodland from 460 to 4,265 feet elevation.	May–July / Perennial shrub	There are 5 herbarium records of Indian Valley bush mallow in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or oak woodland is present in San Mateo and Santa Clara Counties.
<i>Malacothamnus arcuatus</i> Arcuate bush mallow	–/–/1B.2	This species occurs in chaparral from 50 to 1,165 feet elevation.	April–September / Perennial shrub	There are 29 CNDDDB records of arcuate bush mallow in the study area.	Likely to occur. The Permit Area intersects 17 occurrences of this species. Potential habitat for this species occurs where chaparral is present in San Mateo and Santa Clara Counties.
<i>Malacothamnus davidsonii</i> Davidson’s bush mallow	–/–/1B.2	This species occurs in coastal scrub and riparian woodland, in sandy washes from 900 to 2,800 feet elevation.	June–September / Perennial shrub	There are 7 herbarium records of Davidson’s bush mallow in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub or valley-foothill riparian woodland is present in San Mateo and Santa Clara Counties.
<i>Malacothamnus hallii</i> Hall’s bush mallow	–/–/1B.2	This species occurs in chaparral from 800 to 1,350 feet elevation.	May–September / Perennial shrub	There are 30 CNDDDB records of Hall’s bush mallow in the study area.	Likely to occur. The Permit Area intersects 17 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Contra Costa and Santa Clara Counties.
<i>Malacothamnus helleri</i> Heller’s bush mallow	–/–/4.3	This species occurs in foothill woodlands, along stream banks and on gravel bars from 1,000 to 2,085 feet elevation.	May–June / Perennial shrub	There is 1 herbarium record of Heller’s bush mallow in the study area.	Potential to occur. Potential habitat for this species occurs where oak woodland is present in Napa County.
<i>Sidalcea calycosa</i> ssp. <i>rhizomata</i> Point Reyes checkerbloom	–/–/1B.2	This species occurs in freshwater wetlands, including marshes, swamps, and seeps, from 15 to 245 feet elevation.	April–September / Perennial herb	There are 28 CNDDDB records of Point Reyes checkerbloom in the study area.	Likely to occur. The Permit Area intersects 13 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Sonoma and Marin Counties.
<i>Sidalcea hickmanii</i> ssp. <i>napensis</i> Napa checkerbloom	–/–/1B.1	This species occurs in chaparral, on rhyolitic substrates from 1,360 to 2,000 feet elevation.	May–June / Perennial herb	There are 2 CNDDDB records of Napa checkerbloom in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where chaparral is present in Napa County.

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<i>Sidalcea hickmanii</i> ssp. <i>viridis</i> Marin checkerbloom	-/-/1B.3	This species occurs in openings in chaparral, on volcanic or serpentine substrates from 165 to 1,395 feet elevation.	May–June / Perennial herb	There are 4 CNDDDB records of Marin checkerbloom in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Marin and Sonoma Counties.
<i>Sidalcea keckii</i> Keck’s checkerbloom	E/-/1B.1	This species occurs in grassland areas within blue oak woodland, on clay soils derived from serpentinite, from 250 to 2,130 feet elevation.	April–May / Perennial herb	There are 7 CNDDDB records of Keck’s checkerbloom in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where annual grassland or blue oak woodland is present in Napa and Solano Counties.
<i>Sidalcea malachroides</i> Maple-leaved checkerbloom	-/-/4.2	This species occurs in openings in coastal scrub, broadleaved upland forest, redwood forest, Douglas-fir forest, and in coastal prairie below 2,395 feet elevation.	May–August / Perennial herb	There are 7 CNDDDB records of maple-leaved checkerbloom in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where coastal scrub, perennial grassland, or montane hardwood-conifer forest is present in Sonoma County.
<i>Sidalcea malviflora</i> ssp. <i>purpurea</i> Purple-stemmed checkerbloom	-/-/1B.2	This species occurs in broadleaved upland forest and coastal prairie from 50 to 280 feet elevation.	May–June / Perennial herb	There are 13 CNDDDB records of purple-stemmed checkerbloom in the study area.	Likely to occur. The Permit Area intersects 10 occurrences of this species. Potential habitat for this species occurs where perennial grassland, or montane hardwood-conifer forest is present in Sonoma and Marin Counties.
<i>Sidalcea oregana</i> ssp. <i>hydrophila</i> Marsh checkerbloom	-/-/1B.2	This species occurs in meadows and moist areas in perennial grassland from 985 to 7,530 feet elevation.	July–August / Perennial herb	There is 1 CNDDDB record of marsh checkerbloom in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where perennial grassland or wet meadow is present in Napa County.
<i>Sidalcea oregana</i> ssp. <i>valida</i> Kenwood Marsh checkermallow	E/E/1B.2	This species occurs in freshwater marsh from 375 to 490 feet elevation.	June–September / Perennial herb	There are 2 CNDDDB records of Kenwood Marsh checkermallow in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Napa County.
Melanthiaceae – False-Hellebore Family					
<i>Toxicoscordion fontanum</i> Marsh zigadenus	-/-/4.2	This species occurs in moist or marshy areas of chaparral, woodlands, and lower montane coniferous forests below 1,640 feet elevation.	April–July / Perennial herb	Based on herbarium specimens, there are about 26 occurrences of marsh zigadenus in the study area.	Potential to occur. Potential habitat for this species occurs where freshwater emergent wetland is present in serpentine chaparral, oak woodland, and montane hardwood-conifer forest in Napa, Sonoma, and Marin Counties.
<i>Veratrum fimbriatum</i> Fringed false-hellebore	-/-/4.2	This species occurs in wet meadows and other wetlands in coastal scrub and North Coast coniferous forests below 330 feet elevation.	July–September / Perennial herb	Based on herbarium specimens, there are about 8 occurrences of fringed false-hellebore in the study area.	Potential to occur. Potential habitat for this species occurs where wet meadow is present in Sonoma County.
Montiaceae – Miner’s-Lettuce Family					
<i>Calandrinia breweri</i> Brewer’s calandrinia	-/-/4.2	This species occurs in open areas in chaparral, northern coastal scrub and coastal sage scrub, often after fires or other disturbance, below 3,935 feet elevation.	February–May / Annual herb	Based on herbarium specimens, there are about 24 occurrences of Brewer’s calandrinia in the study area.	Potential to occur. Potential habitat for this species occurs in various disturbed or burned chaparral and coastal scrub habitats throughout the study area.
<i>Calyptridium parryi</i> var. <i>hesseae</i> Santa Cruz Mountain pussypaws	-/-/1B.1	This species occurs in openings in chaparral, cypress forest, on bare, sandy soil, from 1,000 to 5,020 feet elevation.	April–July / Annual herb	There are 3 CNDDDB records of Santa Cruz Mountains pussypaws in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where mixed chaparral or closed-cone pine-cypress forest is present in Santa Clara County.
<i>Calyptridium quadripetalum</i> Four-petaled pussypaws	-/-/4.3	This species occurs in open, sandy or gravelly areas, usually on serpentine soils, from 1,310 to 6,560 feet elevation.	April–June / Annual herb	Based on herbarium specimens, there are about 8 occurrences of four-petaled pussypaws in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma and Napa Counties.
Onagraceae – Evening-Primrose Family					
<i>Clarkia breweri</i> Brewer’s clarkia	-/-/4.2	This species occurs in chaparral and cismontane woodland, coastal scrub, on talus or dry slopes, often serpentine, below 4,000 feet elevation.	April–June / Annual herb	Based on herbarium specimens, there are about 14 occurrences of Brewer’s clarkia in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or blue oak woodland is present in Alameda and Santa Clara Counties.
<i>Clarkia concinna</i> ssp. <i>automixa</i> Santa Clara red-ribbons	-/-/4.3	This species occurs in mesic, shaded oak woodlands from 295 to 4,920 feet elevation.	April–July / Annual herb	There are 20 CNDDDB records of Santa Clara red-ribbons in the study area.	Likely to occur. The Permit Area intersects 15 occurrences of this species. Potential habitat for this species occurs where blue oak woodland is present in Santa Clara County.
<i>Clarkia concinna</i> ssp. <i>raichei</i> Raiche’s red-ribbons	-/-/1B.1	This species occurs in coastal bluff scrub, on exposed rocky bluffs, below 330 feet elevation.	April–May / Annual herb	There is 1 CNDDDB record of Raiche’s red-ribbons in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where coastal scrub is present in Marin County.

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<i>Clarkia franciscana</i> Presidio clarkia	E/E/1B.1	This species occurs in coastal scrub, grasslands, on serpentine soils, from 80 to 1,100 feet elevation.	May–July / Annual herb	There are 4 CNDDDB records of Presidio clarkia in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where coastal scrub or annual grassland is present in San Francisco and Alameda Counties (ICF 2016).
<i>Clarkia gracilis</i> ssp. <i>tracyi</i> Tracy’s clarkia	–/–/4.2	This species occurs in serpentine chaparral, McNab cypress forest, in the open areas of meadow or streambanks from 330 to 1,640 feet elevation.	April–July / Annual herb	Based on herbarium specimens, there are about 7 occurrences of Tracy’s clarkia in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral or closed-cone pine-cypress forest is present in Napa County.
<i>Clarkia imbricata</i> Vine Hill clarkia	E/E/1B.1	This species occurs in grassy areas in oak woodland from 165 to 245 feet elevation.	June–August / Annual herb	There are 3 CNDDDB records of Vine Hill clarkia in the study area.	Unlikely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where oak woodland is present in Sonoma County (ICF 2016).
<i>Oenothera deltoides</i> ssp. <i>howellii</i> Antioch Dunes evening primrose	E/E/1B.1	This species occurs in inland dunes below 100 feet elevation.	March– September / Perennial herb	There are 9 CNDDDB records of Antioch Dunes evening primrose in the study area.	Present. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where dunes are present in Contra Costa County (ICF 2016).
Orchidaceae – Orchid Family					
<i>Cypripedium californicum</i> California lady’s-slipper	–/–/4.2	This species occurs in bogs and fens, seeps and stream banks in lower montane coniferous forest, usually on serpentine soils, from 100 to 9,020 feet elevation.	April–August / Perennial herb	There are 8 herbarium records of California lady’s-slipper in the study area.	Potential to occur. Potential habitat for this species occurs where freshwater emergent wetland is present in Sonoma, Marin, and San Francisco Counties.
<i>Cypripedium fasciculatum</i> Clustered lady’s-slipper	–/–/4.2	This species occurs in mesic to moist areas in shady conifer forests from 330 to 6,560 feet elevation.	March-July / Perennial herb	There are 8 herbarium records of clustered lady’s-slipper in the study area.	Potential to occur. Potential habitat for this species occurs where montane hardwood-conifer forest is present in San Mateo and Santa Clara Counties.
<i>Cypripedium montanum</i> Mountain lady’s-slipper	–/–/4.2	This species occurs on dry, undisturbed slopes in lower montane coniferous forest, broadleafed upland forest, cismontane woodland, and North Coast coniferous forest from 605 to 7,300 feet elevation.	March–August / Perennial herb	There are 9 herbarium records of mountain lady’s-slipper in the study area.	Potential to occur. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Sonoma, San Mateo, and Santa Clara Counties.
<i>Piperia candida</i> White-flowered rein orchid	–/–/4.2	This species occurs in the understory of redwood forest and Douglas-fir forest below 3,940 feet elevation.	May– September / Perennial herb	There are 6 CNDDDB records of white-flowered rein orchid in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where redwood forest or Douglas-fir forest are present in Sonoma and Santa Cruz Counties.
<i>Piperia elegans</i> ssp. <i>decurtata</i> Pt. Reyes rein orchid	–/–/1B.1	This species occurs in coastal bluff scrub and coastal prairie from 50 to 510 feet elevation.	August– September / Perennial herb	There are 6 CNDDDB records of Pt. Reyes rein orchid in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where coastal scrub and perennial grassland are present in Marin County.
<i>Piperia leptopetala</i> Narrow-petaled rein orchid	–/–/4.3	This species occurs in dry scrub and woodland habitats from 1,245 to 7,300 feet elevation.	May–July / Perennial herb	Based on herbarium records, there are 3 occurrences of narrow-petaled rein orchid in the study area.	Potential to occur. Potential habitat for this species occurs where oak woodland or montane hardwood-conifer forest are present in Sonoma, Napa, and Santa Clara Counties.
<i>Piperia michaelii</i> Michael’s rein orchid	–/–/4.2	This species occurs in dry sites in coastal scrub, woodlands, mixed evergreen forest, and closed-cone pine forest, below 2,295 feet elevation.	April–August / Perennial herb	There are 19 herbarium records of Michael’s rein orchid in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub, coastal oak woodland, closed-cone pine-cypress forest or montane hardwood-conifer forest are present in Marin, San Francisco, San Mateo, Contra Costa, Alameda, and Santa Clara Counties.
Orobanchaceae – Broomrape Family					
<i>Aphyllon validum</i> ssp. <i>howellii</i> Howell’s broomrape	–/–/4.3	This species occurs in chaparral, on volcanic and serpentine soils, parasitic on Garrya, from 655 to 5,575 feet elevation.	June–September / Perennial herb	Based on herbarium records, there are 4 occurrences of Howell’s broomrape in the study area.	Potential to occur. Potential habitat for this species occurs where mixed chaparral is present in Sonoma and Napa Counties.
<i>Castilleja affinis</i> ssp. <i>neglecta</i> Tiburon paintbrush	E/T/1B.2	This species occurs in serpentine grassland from 195 to 1,310 feet elevation.	April–June / Perennial herb	There are 7 CNDDDB records of Tiburon paintbrush in the study area.	Present. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in Marin, Napa, and Santa Clara Counties (ICF 2016).
<i>Castilleja ambigua</i> ssp. <i>ambigua</i> Salt marsh owl’s-clover	–/–/4.2	This species occurs on coastal bluffs and terraces, in grassland, below 1,640 feet elevation.	May–August / Annual herb	There are 86 herbarium records of salt marsh owl’s-clover in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub is present in the study area.
<i>Castilleja ambigua</i> ssp. <i>humboldtensis</i> Humboldt Bay owl’s-clover	–/–/1B.2	This species occurs in coastal salt marsh below 15 feet elevation.	April–August / Annual herb	There are 4 CNDDDB records of Humboldt Bay owl’s-clover in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Sonoma and Marin Counties.

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<i>Castilleja ambigua</i> ssp. <i>meadii</i> Mead’s owl’s-clover	–/–/1B.1	This species occurs in vernal pools and meadows on volcanic clay soils from 1,475 to 1,560 feet elevation.	April–May / Annual herb	There are 3 CNDDDB records of Mead’s owl’s-clover in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where vernal pools are present in Napa County.
<i>Castilleja leschkeana</i> Point Reyes paintbrush	–/–/1A	This species occurs in coastal marshes and swamps below 35 feet elevation.	June / Perennial herb	There are 2 CNDDDB records of Point Reyes paintbrush in the study area.	Unlikely to occur. The Permit Area intersects 2 occurrences of this species; however, both occurrences are possibly extirpated. Potential habitat for this species occurs where freshwater emergent wetland is present in Marin County.
<i>Castilleja mendocinensis</i> Mendocino Coast paintbrush	–/–/1B.2	This species occurs in coastal scrub and perennial grassland below 525 feet elevation.	April–August / Perennial herb	There is 1 CNDDDB record of Mendocino Coast paintbrush in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where coastal scrub and perennial grassland are present in Sonoma County.
<i>Castilleja rubicundula</i> ssp. <i>rubicundula</i> Pink creamsacs	–/–/1B.2	This species occurs in grassland and grassy areas in chaparral and oak woodland, often on serpentine soils, from 65 to 3,020 feet elevation.	April–June / Annual herb	There are 4 CNDDDB records of pink creamsacs in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Napa and Santa Clara Counties.
<i>Castilleja uliginosa</i> Pitkin Marsh paintbrush	–/E/1A	This species occurs in freshwater marsh, at 155 to 200 feet elevation.	June–July / Perennial herb	There are 2 CNDDDB records of Pitkin Marsh paintbrush in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrences of this species. Both known occurrences are possibly extirpated. Potential habitat for this species occurs where freshwater emergent wetlands are present in in Sonoma County (ICF 2016).
<i>Chloropyron maritimum</i> ssp. <i>palustre</i> Pt. Reyes salty bird’s-beak	–/–/1B.2	This species occurs in coastal salt marsh below 35 feet elevation.	June–October / Annual herb	There are 51 CNDDDB records of Pt. Reyes salty bird’s-beak in the study area.	Likely to occur. The Permit Area intersects 18 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Sonoma, Marin, San Francisco, San Mateo, Santa Clara, and Alameda Counties.
<i>Chloropyron molle</i> ssp. <i>hispidum</i> Hispid salty bird’s-beak	–/–/1B.1	This species occurs in meadow, grassland, playa; on alkaline soils, below 500 feet elevation.	June–September / Annual herb	There are 2 CNDDDB records of hispid salty bird’s-beak in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where wet meadow in alkaline soils is present in Solano and Alameda Counties.
<i>Chloropyron molle</i> ssp. <i>molle</i> Soft bird’s-beak	E/R/1B.2	This species occurs in tidal salt marsh below 10 feet elevation.	July–September / Annual herb	There are 26 CNDDDB records of soft salty bird’s-beak in the study area.	Likely to occur. The Permit Area intersects 7 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Sonoma, Marin, Napa, Solano, and Contra Costa Counties.
<i>Chloropyron palmatum</i> Palmate-bracted bird’s-beak	E/E/1B.1	This species occurs in alkaline grasslands, chenopod scrub from 15 to 510 feet elevation.	May–October / Annual herb	There is 1 CNDDDB record of palmate-bracted bird’s-beak in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where alkali desert scrub is present in Alameda County.
<i>Cordylanthus nidularis</i> Mt. Diablo bird’s-beak	–/R/1B.1	This species occurs in grassy or rocky areas within serpentine chaparral, at 2,510 feet elevation.	July–August / Annual herb	There are 2 CNDDDB records of Mt. Diablo bird’s-beak in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in in Contra Costa County.
<i>Cordylanthus tenius</i> ssp. <i>brunneus</i> Serpentine bird’s-beak	–/–/4.3	This species occurs on rocky serpentine slopes from 1,000 to 3,000 feet elevation.	July–August / Annual herb	There are 26 herbarium records of serpentine bird’s-beak in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma and Napa Counties.
<i>Cordylanthus tenius</i> ssp. <i>capillaris</i> Pennell’s bird’s-beak	E/R/1B.2	This species occurs on rocky serpentine slopes from 150 to 1,000 feet elevation.	June-July / Annual herb	There are 4 herbarium records of Pennell’s bird’s-beak in the study area.	Present. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Alameda County (ICF 2016).
<i>Kopsiopsis hookeri</i> Small groundcone	–/–/2B.3	This species occurs in North Coast coniferous forest, usually parasitic on salal plants, from 395 to 4,710 feet elevation.	April–August / Perennial herb	There are 5 CNDDDB records of small groundcone in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Sonoma and Marin Counties.
<i>Pedicularis dudleyi</i> Dudley’s lousewort	–/R/1B.2	This species occurs in maritime chaparral, North Coast coniferous forest, and valley and foothill grassland from 195 to 2,955 feet elevation.	April–June / Perennial herb	There is 1 CNDDDB record of Dudley’s lousewort in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where annual grassland, mixed chaparral, montane hardwood-conifer forest, or redwood forest is present in San Mateo County.
<i>Triphysaria floribunda</i> San Francisco owl’s-clover	–/–/1B.2	This species occurs in coastal prairie and annual grassland, on serpentine soils, from 35 to 525 feet elevation.	April–June / Annual herb	There are 50 CNDDDB records of San Francisco owl’s-clover in the study area.	Likely to occur. The Permit Area intersects 25 occurrences of this species. Potential habitat for this species occurs where serpentine grassland is present in Marin, San Francisco, and San Mateo Counties.

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Papaveraceae – Poppy Family					
<i>Eschscholzia rhombipetala</i> Diamond-petaled California poppy	–/–/1B.1	This species occurs in grassland, chenopod scrub; on clay soils where grass cover is sparse enough to allow growth of low annuals, below 3,200 feet elevation.	March–May / Annual herb	There are 5 CNDDDB records of diamond-petaled California poppy in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where annual grassland is present in Contra Costa and Alameda Counties.
<i>Meconella oregona</i> Oregon meconella	–/–/1B.1	This species occurs in coastal prairie and coastal scrub from 820 to 1,645 feet elevation.	March–April / Annual herb	There are 5 CNDDDB records of Oregon meconella in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where coastal scrub or perennial grassland is present in Contra Costa and Santa Clara Counties (ICF 2016).
Phrymaceae – Monkeyflower Family					
<i>Erythranthe nudata</i> Bare monkeyflower	–/–/4.3	This species occurs in serpentine seeps from 820 to 2,295 feet elevation.	May–June / Annual herb	Based on herbarium records, there are about 11 occurrences of bare monkeyflower in the study area.	Potential to occur. Potential habitat for this species occurs where seeps are present in serpentine chaparral or closed-cone pine-cypress forest are present in Sonoma and Napa Counties.
Pinaceae – Pine Family					
<i>Pinus radiata</i> Monterey pine	–/–/1B.1	This species occurs in Monterey pine forest and oak woodland from 200 to 410 feet elevation.	Year-round / Perennial evergreen tree	There is 1 CNDDDB record of Monterey pine in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where closed-cone pine-cypress forest is present in San Mateo County.
Plantaginaceae – Plantain Family					
<i>Antirrhinum virga</i> Tall snapdragon	–/–/4.3	This species occurs in open rocky areas in chaparral, often on serpentinite, from 330 to 7,055 feet elevation.	June–July / Perennial herb	There are 26 herbarium records of tall snapdragon in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Sonoma and Napa Counties.
<i>Collinsia corymbosa</i> Round-headed Chinese houses	–/–/1B.2	This species occurs in coastal dunes below 65 feet elevation.	April–June / Annual herb	There are 4 CNDDDB records of round-headed Chinese houses in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where dunes are present in Marin, San Francisco, and San Mateo Counties.
<i>Collinsia multicolor</i> San Francisco collinsia	–/–/1B.2	This species occurs in Northern Coastal scrub and closed-cone coniferous forest from 100 to 820 feet elevation.	March–May / Annual herb	There are 24 CNDDDB records of San Francisco collinsia in the study area.	Likely to occur. The Permit Area intersects 17 occurrences of this species. Potential habitat for this species occurs where coastal scrub or closed-cone pine-cypress forest is present in San Francisco, San Mateo, and Santa Clara Counties.
<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	–/E/1B.2	This species occurs in vernal pools and swales from 30 to 7,790 feet elevation.	April–June / Annual herb	There are 7 CNDDDB records of Boggs Lake hedge-hyssop in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma and Solano Counties (ICF 2016).
<i>Penstemon newberryi</i> var. <i>sonomensis</i> Sonoma beardtongue	–/–/1B.3	This species occurs in rocky areas in chaparral from 2,295 to 4,495 feet elevation.	May–July / Perennial herb	There are 10 CNDDDB records of Sonoma beardtongue in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Napa and Sonoma Counties.
<i>Penstemon rattanii</i> var. <i>kleei</i> Santa Cruz Mountains beardtongue	–/–/1B.2	This species occurs on sandy shale slopes, in chaparral/forest transition zones from 1,310 to 3,610 feet elevation.	May–June / Perennial herb	There are 2 CNDDDB records of Santa Cruz Mountains beardtongue in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Santa Clara County.
Poaceae – Grass Family					
<i>Agrostis blasdalei</i> var. <i>blasdalei</i> Blasdale’s bent grass	–/–/1B.2	This species occurs in coastal dunes, coastal scrub, and perennial grassland below 490 feet elevation.	May–July / Perennial grass	There are 35 CNDDDB records of Blasdale’s bent grass in the study area.	Likely to occur. The Permit Area intersects 16 occurrences of this species. Potential habitat for this species occurs where dunes, coastal scrub, or perennial grassland are present in Sonoma, Marin, and San Mateo Counties.
<i>Agrostis hendersonii</i> Henderson’s bent grass	–/–/3.2	This species occurs in moist places in grasslands, and vernal pool from 230 to 1,000 feet elevation.	April–May / Annual grass	There is 1 CNDDDB record of Henderson’s bent grass in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where annual grassland and vernal pools occur in Marin County.
<i>Alopecurus aequalis</i> var. <i>sonomensis</i> Sonoma alopecurus	E/–/1B.1	This species occurs in wet areas, marshes, and riparian banks from 15 to 1,200 feet elevation.	May–July / Perennial grass	There are 21 CNDDDB records of Sonoma alopecurus in the study area.	Absent. The Permit Area intersects 18 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland and valley/foothill riparian woodlands are present in Sonoma and Marin Counties (ICF 2016).
<i>Calamagrostis bolanderi</i> Bolander’s reed grass	–/–/4.2	This species occurs in meadows, marshes and other wet areas in North Coast coniferous forest, closed-cone coniferous forest, and coastal scrub below 1,495 feet elevation.	May–August / Perennial grass	Based on herbarium records, there are 9 occurrences of this species in the study area.	Potential to occur. Potential habitat for this species occurs where wet meadow is present in Sonoma County.

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<i>Calamagrostis crassiglumis</i> Thurber’s reed grass	–/–/2B.1	This species occurs in freshwater emergent wetland within coastal scrub from 35 to 195 feet elevation.	May–August / Perennial grass	There are 9 CNDDDB records of Thurber’s reed grass in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in Sonoma and Marin Counties.
<i>Calamagrostis ophitidis</i> Serpentine reed grass	–/–/4.3	This species occurs in open areas in serpentine chaparral and woodland, and serpentine grassland and meadow, below 3,495 feet elevation.	April–June / Perennial grass	There are 39 herbarium records of serpentine reed grass in the study area.	Likely to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa, Sonoma, and Marin Counties.
<i>Elymus californicus</i> California bottle-brush grass	–/–/4.3	This species occurs in conifer forest below 1,640 feet elevation.	May–August / Perennial grass	There are 50 herbarium records of California bottle-brush grass in the study area.	Potential to occur. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Sonoma, Marin, and San Mateo Counties.
<i>Hordeum intercedens</i> Vernal barley	–/–/3.2	This species occurs in vernal pools, saline streambeds, and alkali flats from 15 to 3,280 feet elevation.	March–June / Annual grass	There are no CNDDDB or herbarium records for vernal barley in the study area, although the CNPS Inventory reports San Mateo County to be within the species’ range.	Potential to occur. Potential habitat for this species occurs where vernal pools are present in the study area.
<i>Neostapfia colusana</i> Colusa grass	E/E/1B.1	This species occurs in vernal pools from 15 to 655 feet elevation.	May–August / Annual grass	There are 4 CNDDDB records of Colusa grass in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where vernal pools are present in Solano County (ICF 2016).
<i>Orcuttia inaequalis</i> San Joaquin Orcutt grass	T/E/1B.1	This species occurs in vernal pools from 35 to 2,475 feet elevation.	April– September / Annual grass	There is 1 CNDDDB record of San Joaquin Orcutt grass in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where vernal pools are present in Solano County (ICF 2016).
<i>Panicum acuminatum</i> var. <i>thermale</i> Geysers panicum	–/E/1B.1	This species occurs in McNab cypress woodland, meadows, and grasslands, along streams and near hot springs, from 1,495 to 8,105 feet elevation.	June– September/ Perennial grass	There are 5 CNDDDB records of Geysers panicum in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where hot springs are present in closed-cone pine-cypress forest in Sonoma County.
<i>Pleuropogon hooverianus</i> North Coast semaphore grass	–/T/1B.1	This species occurs in moist, grassy, sometimes shaded areas, in broadleafed upland forest, as well as in vernal pools, from 35 to 2,200 feet elevation.	May–August / Perennial grass	There are 7 CNDDDB records of North Coast semaphore grass in the study area.	Present. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where wet meadow is present in Sonoma and Marin Counties (ICF 2016).
<i>Pleuropogon refractus</i> Nodding semaphore grass	–/–/4.2	This species occurs in wet meadows and shady banks, below 5,250 feet elevation.	April–July / Perennial grass	Based on herbarium records, there are 3 occurrences of nodding semaphore grass in the study area.	Potential to occur. Potential habitat for this species occurs where wet meadow or valley/foothill riparian scrub is present in Marin County.
<i>Poa napensis</i> Napa bluegrass	E/E/1B.1	This species occurs in alkaline areas near thermal springs from 330 to 655 feet elevation.	May–August / Perennial grass	There are 2 CNDDDB records of Napa bluegrass in the study area.	Present. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where wet meadow is present in Napa County (ICF 2016).
<i>Puccinellia simplex</i> California alkali grass	–/–/1B.2	This species occurs in seasonally wet alkaline wetlands, sinks, flats, vernal pools, and lake margins below 3,000 feet elevation.	March–May / Annual grass	There are 14 CNDDDB records of California alkali grass in the study area.	Likely to occur. The Permit Area intersects 11 occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools, wet meadow in alkaline soils, or alkali desert scrub is present in Napa, Solano, Contra Costa, Alameda, and Santa Clara Counties.
<i>Tuctoria mucronata</i> Solano grass	E/E/1B.1	This species occurs in vernal pools from 35 to 65 feet elevation.	April–August / Annual grass	There are 2 CNDDDB records of Solano grass in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where alkaline vernal pools are present in Solano County (ICF 2016).
Polemoniaceae – Phlox Family					
<i>Collomia diversifolia</i> Serpentine collomia	–/–/4.3	This species occurs in open, rocky to gravelly areas in serpentine chaparral from 195 to 2,970 feet elevation.	April–July /Annual herb	There are 34 herbarium records of serpentine collomia in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa, Sonoma, Marin, and Contra Costa Counties.
<i>Eriastrum ertterae</i> Lime Ridge woollystar	–/–/1B.1	This species occurs in open areas in chaparral, in alkaline or semi-alkaline sandy soils from 690 to 900 feet elevation.	June–July / Annual herb	There are 2 CNDDDB records of Lime Ridge woollystar in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where chaparral is present in Contra Costa County.
<i>Eriastrum tracyi</i> Tracy’s woollystar	–/R/1B.2	This species occurs in chenopod scrub, grassland, and sparsely vegetated alkaline alluvial fans from 315 to 5,840 feet elevation.	April–July / Annual herb	There are 4 CNDDDB records of Tracy’s woollystar in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where annual grassland, oak woodland, or chaparral is present in Santa Clara County (ICF 2016).

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<i>Gilia capitata</i> ssp. <i>chamissonis</i> Blue coast gilia	-/-/1B.1	This species occurs in coastal dunes and coastal scrub below 660 feet elevation.	April–July / Annual herb	There are 31 CNDDDB records of blue coast gilia in the study area.	Likely to occur. The Permit Area intersects 19 occurrences of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in Sonoma, Marin, and San Francisco Counties.
<i>Gilia capitata</i> ssp. <i>pacifica</i> Pacific gilia	-/-/1B.2	This species occurs in coastal prairie and coastal scrub from 15 to 5,465 feet elevation.	May–August / Annual herb	There are 4 CNDDDB records of Pacific gilia in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where coastal scrub and perennial grassland are present in Sonoma County.
<i>Gilia capitata</i> ssp. <i>tomentosa</i> Woolly-headed gilia	-/-/1B.1	This species occurs on rocky serpentinite outcrops in coastal bluff scrub, and valley and foothill woodlands from 35 to 720 feet elevation.	May–July / Annual herb	There are 11 CNDDDB records of woolly-headed gilia in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Sonoma and Marin Counties.
<i>Gilia millefoliata</i> Dark-eyed gilia	-/-/1B.2	This species occurs in coastal dunes from 10 to 100 feet elevation.	April–July / Annual herb	There are 21 CNDDDB records of dark-eyed gilia in the study area.	Likely to occur. The Permit Area intersects 10 occurrences of this species. Potential habitat for this species occurs where dunes are present in Sonoma, Marin, and San Francisco Counties.
<i>Leptosiphon acicularis</i> Bristly linanthus	-/-/4.2	This species occurs in open grassy areas in chaparral and woodlands below 2,295 feet elevation.	April–June / Annual herb	There are 42 herbarium records of bristly linanthus in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland or oak woodland is present in Sonoma, Marin, Napa, San Mateo, and Alameda Counties.
<i>Leptosiphon ambiguus</i> Serpentine linanthus	-/-/4.2	This species occurs in serpentine grassland below 3,280 feet elevation.	March–June / Annual herb	There are 121 herbarium records of serpentine linanthus in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine grassland is present in Contra Costa, Alameda, Santa Clara, and San Mateo Counties.
<i>Leptosiphon croceus</i> Coast yellow linanthus	-/-/1B.1	This species occurs in coastal bluff scrub and coastal prairie from 35 to 490 feet elevation.	April–June / Annual herb	There is 1 CNDDDB record of coast yellow linanthus in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrence of this species. The species is known only from a single occurrence. Potential habitat for this species occurs where coastal scrub and perennial grassland are present in San Mateo County.
<i>Leptosiphon grandiflorus</i> Large-flowered linanthus	-/-/4.2	This species occurs in grasslands, on sandy soils below 3,935 feet elevation.	April–July / Annual herb	There are 66 herbarium records of large-flowered linanthus in the study area.	Unlikely to occur. Potential habitat for this species occurs where annual grassland is present in Contra Costa, Alameda, Santa Clara, Marin, San Francisco, and San Mateo Counties (ICF 2016).
<i>Leptosiphon jepsonii</i> Jepson's linanthus	-/-/1B.2	This species occurs in grassy slopes, on volcanics or periphery of serpentinite from 330 to 1,640 feet elevation.	March–May / Annual herb	There are 37 CNDDDB records of Jepson's linanthus in the study area.	Likely to occur. The Permit Area intersects 18 occurrences of this species. Potential habitat for this species occurs where open, grassy areas in chaparral and oak woodlands are present in Napa and Sonoma Counties.
<i>Leptosiphon latisectus</i> Broad-lobed linanthus	-/-/4.3	This species occurs in open grassy areas in broadleaved evergreen forest, on slopes and roadcuts, below 4,920 feet elevation.	March–June / Annual herb	There are 39 herbarium records of broad-lobed linanthus in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland or montane broadleaved-conifer forest is present in Napa, Sonoma, Marin, San Francisco, and San Mateo Counties.
<i>Leptosiphon rosaceus</i> Rose linanthus	-/-/1B.1	This species occurs in coastal bluff scrub below 330 feet elevation.	April–July / Annual herb	There are 31 herbarium records of rose linanthus in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where coastal scrub present in Sonoma, Marin, and San Mateo Counties.
<i>Navarretia cotulifolia</i> Cotula navarretia	-/-/4.2	This species occurs in chaparral, woodlands, and grasslands on heavy clay soils from 15 to 6,005 feet elevation.	May–June / Annual herb	There are 46 herbarium records of cotula navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland and open grassy areas in chaparral and oak woodland with clay soils are present in the study area.
<i>Navarretia gowenii</i> Lime Ridge navarretia	-/-/1B.1	This species occurs in chaparral, on carbonate-rich clay soils from 590 to 1,000 feet elevation.	May–June / Annual herb	There are 2 CNDDDB records of Lime Ridge navarretia in the study area.	Present. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where open, grassy areas in chaparral are present in Contra Costa County (ICF 2016).
<i>Navarretia heterandra</i> Tehama navarretia	-/-/4.3	This species occurs in mesic areas in valley and foothill grasslands and vernal pools from 100 to 3,315 feet elevation.	April–June / Annual herb	There are 18 herbarium records of Tehama navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where vernal pools and annual grasslands are present in Sonoma, Napa, Solano, and Contra Costa Counties.
<i>Navarretia jepsonii</i> Jepson's navarretia	-/-/4.3	This species occurs in serpentine grasslands and clay flats from 490 to 2,625 feet elevation.	April–June / Annual herb	Based on herbarium records, there are 9 occurrences of Jepson's navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine grassland is present in Sonoma and Napa Counties.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	-/-/1B.1	This species occurs in mesic habitat in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools from 15 to 5,710 feet elevation.	April–July / Annual herb	There are 34 CNDDDB records of Baker's navarretia in the study area.	Likely to occur. The Permit Area intersects 23 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Solano, Napa, Sonoma, and Marin Counties.

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<i>Navarretia leucocephala</i> ssp. <i>pauciflora</i> Few-flowered navarretia	E/T/1B.1	This species occurs in volcanic mud flows and vernal pools from 1,310 to 2,805 feet elevation.	May–June / Annual herb	There are 2 CNDDDB records of few-flowered navarretia in the study area.	Unlikely to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Napa County (ICF 2016).
<i>Navarretia leucocephala</i> ssp. <i>plieantha</i> Many-flowered navarretia	E/E/1B.2	This species occurs in volcanic mud flows and vernal pools from 100 to 3,115 feet elevation.	May–June / Annual herb	There are 2 CNDDDB records of many-flowered navarretia in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where vernal pools are present in Sonoma County.
<i>Navarretia linearifolia</i> ssp. <i>pinnatisecta</i> Pinnate-leaved navarretia	–/–/4.3	This species occurs in openings in sagebrush scrub, chaparral, or forests, on serpentine or volcanic soils from 985 to 7,220 feet elevation.	June–August / Annual herb	Based on herbarium records, there are 3 occurrences of pinnate-leaved navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where chaparral or lower montane coniferous forest are present in Sonoma and Napa Counties.
<i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i> Adobe navarretia	–/–/4.2	This species occurs in vernal pools and clay flats below 3,280 feet elevation.	April–June / Annual herb	There is 1 herbarium record of adobe navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland on clay soils is present in Contra Costa and Alameda Counties.
<i>Navarretia nigelliformis</i> ssp. <i>radians</i> Shiny navarretia	–/–/1B.2	This species occurs in mesic areas with heavy clay soils, in swales and clay flats; in oak woodland and grasslands from 650 to 3,300 feet elevation.	May–June / Annual herb	Based on herbarium records, there are 3 occurrences of shiny navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland on clay soils is present in Contra Costa County.
<i>Navarretia paradoxinota</i> Porter’s navarretia	–/–/1B.3	This species occurs in swales and dry streambeds in serpentine chaparral from 575 to 2,870 feet elevation.	May–July / Annual herb	There are 3 CNDDDB records of Porter’s navarretia in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
<i>Navarretia prostrata</i> Prostrate navarretia	–/–/1B.1	This species occurs in vernal pools and mesic areas in coastal scrub and alkali grasslands from 10 to 3,970 feet elevation.	April–July / Annual herb	There are 3 CNDDDB records of prostrate navarretia in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where vernal pools are present in Alameda County (ICF 2016).
<i>Navarretia rosulata</i> Marin County navarretia	–/–/1B.2	This species occurs in chaparral and Sargent cypress forest, on serpentine soils, from 655 to 2,085 feet elevation.	May–July / Annual herb	There are 15 CNDDDB records of Marin County navarretia in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral or closed-cone pine-cypress forest is present in Marin and Napa Counties.
<i>Navarretia subuligera</i> Awl-leaved navarretia	–/–/4.3	This species occurs in rocky, mesic areas in chaparral, cismontane woodland, and lower montane coniferous forest from 490 to 3,610 feet elevation.	April–August / Annual herb	Based on herbarium records, there are 6 occurrences of awl-leaved navarretia in the study area.	Potential to occur. Potential habitat for this species occurs where coastal scrub, perennial grassland or montane hardwood-conifer forest is present in Napa County.
<i>Polemonium carneum</i> Oregon polemonium	–/–/2B.2	This species occurs in coastal prairie, coastal scrub, and lower montane coniferous forest below 6,005 feet elevation.	April– September / Perennial herb	There are 6 CNDDDB records of Oregon polemonium in the study area.	Unlikely to occur. The Permit Area intersects 5 occurrences of this species. All occurrences in the study area are historic (before 1940). Potential habitat for this species occurs where serpentine chaparral or closed-cone pine-cypress forest is present in Marin and Napa Counties.
Polygonaceae – Buckwheat Family					
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i> San Francisco Bay spineflower	–/–/1B.2	This species occurs in coastal dunes, coastal bluff scrub, coastal scrub, and coastal prairie, on sandy soil from 10 to 705 feet elevation.	April–July / Perennial herb	There are 17 CNDDDB records of San Francisco Bay spineflower in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in Marin, San Francisco, and San Mateo Counties.
<i>Chorizanthe cuspidata</i> var. <i>villosa</i> Woolly-headed spineflower	–/–/1B.2	This species occurs in coastal dunes, coastal scrub, coastal prairie, in sandy soil, from 30 to 195 feet elevation.	May–August / Annual herb	There are 17 CNDDDB records of woolly-headed spineflower in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where dunes and coastal scrub are present in Sonoma and Marin Counties.
<i>Chorizanthe robusta</i> ssp. <i>robusta</i> Robust spineflower	E/–/1B.1	This species occurs in coastal dunes and coastal scrub, on sandy soil, from 10 to 985 feet elevation.	April– September / Annual herb	There are 5 CNDDDB records of robust spineflower in the study area.	Unlikely to occur. The Permit Area intersects 5 occurrences of this species; however, all of these occurrences are possibly extirpated. Potential habitat for this species occurs where dunes and coastal scrub are present in San Francisco, San Mateo, Alameda, and Santa Clara Counties.
<i>Chorizanthe valida</i> Sonoma spineflower	E/E/1B.1	This species occurs in coastal prairie from 35 to 1,000 feet elevation.	June–August / Annual herb	There are 6 CNDDDB records of Sonoma spineflower in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Sonoma and Marin Counties.
<i>Eriogonum argillosum</i> Clay-loving buckwheat	–/–/4.3	This species occurs in cismontane woodland on serpentine or clay soils from 490 to 2,625 feet elevation.	March–June / Annual herb	There are 3 herbarium records of clay-loving buckwheat in the study area.	Potential to occur. Potential habitat for this species occurs where open areas in oak woodland with clay soils are present in Santa Clara County.
<i>Eriogonum cedrorum</i> The Cedars buckwheat	–/–/1B.3	This species occurs in serpentine barrens from 1,200 to 1,805 feet elevation.	June–September / Perennial herb	There are 3 CNDDDB records of The Cedars buckwheat in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where closed-cone pine-cedar forest is present in Sonoma County.

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<i>Eriogonum luteolum</i> var. <i>caninum</i> Tiburon buckwheat	-/-/1B.2	This species occurs in grassland, coastal prairie, and coastal scrub on serpentine soils below 1,650 feet elevation.	May–September / Annual herb	There are 26 CNDDDB records of Tiburon buckwheat in the study area.	Likely to occur. The Permit Area intersects 15 occurrences of this species. Potential habitat for this species occurs where grassland or coastal scrub in serpentine soils is present in Alameda and Marin Counties.
<i>Eriogonum nervulosum</i> Snow Mountain buckwheat	-/-/1B.2	This species occurs in chaparral, on serpentine soils from 985 to 2,105 feet elevation.	June–September / Perennial herb	There are 3 CNDDDB records of Snow Mountain buckwheat in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where serpentine chaparral is present in Napa and Sonoma Counties.
<i>Eriogonum nudum</i> var. <i>decurrens</i> Ben Lomond buckwheat	-/-/1B.1	This species occurs in chaparral and maritime ponderosa pine sandhills from 165 to 2,610 feet elevation.	June–October / Perennial herb	There are no CNDDDB records of Ben Lomond buckwheat in the study area. There is 1 herbarium record of Ben Lomond buckwheat in Marin County that appears to be erroneous.	Absent. No potential habitat for this species occurs in the study area.
<i>Eriogonum nudum</i> var. <i>psychicola</i> Antioch Dunes buckwheat	-/-/1B.1	This species occurs in interior dunes below 65 feet elevation.	July–October / Perennial herb	There is 1 CNDDDB record of Antioch Dunes buckwheat in the study area.	Present. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where dunes are present in Contra Costa County.
<i>Eriogonum ternatum</i> Ternate buckwheat	-/-/4.3	This species occurs in serpentine barrens, conifer woodland, and open rocky areas in conifer forest from 1,310 to 5,575 feet elevation.	June–August / Perennial herb	There are no herbarium or CNDDDB records from the study area. Reported locations in the study area are erroneous.	Absent. Habitat for this species is not present in the Permit Area.
<i>Eriogonum tripodum</i> Tripod buckwheat	-/-/4.2	This species occurs in gravelly slopes and flats, often on serpentine, in chaparral and cismontane woodland from 655 to 5,250 feet elevation.	May–July / Perennial herb	There are 3 herbarium records of tripod buckwheat in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Napa County.
<i>Eriogonum truncatum</i> Mt. Diablo buckwheat	-/-/1B.1	This species occurs in coarse sandy soil in grasslands from 10 to 1,150 feet elevation.	April–September / Annual herb	There are 7 CNDDDB records of Mt. Diablo buckwheat in the study area.	Potential to occur. The Permit Area intersects 7 occurrences of this species. Most occurrences are based on historic records. Potential habitat for this species occurs where annual grassland is present in Solano and Contra Costa Counties.
<i>Eriogonum umbellatum</i> var. <i>bahiiforme</i> Bay buckwheat	-/-/4.2	This species occurs on serpentine soils from 2,295 to 7,220 feet elevation.	July–September / Perennial herb	Based on herbarium records, there are 8 occurrences of Bay buckwheat in the study area.	Potential to occur. Potential habitat for this species occurs where oak woodland or montane coniferous forest, often on serpentine soils, is present in Sonoma, Napa, Contra Costa, Alameda, and Santa Clara Counties.
<i>Polygonum marinense</i> Marin knotweed	-/-/3.1	This species occurs in coastal salt and brackish marshes and swamps below 35 feet elevation.	April–October / Annual herb	Based on herbarium records, there are about 15 occurrences of Marin knotweed in the study area.	Potential to occur. Potential habitat for this species occurs where high elevation tidal marsh is present in Sonoma, Napa, Solano, Marin, and Alameda Counties.
Pontederiaceae – Pickerel-Weed Family					
<i>Heteranthera dubia</i> Water star-grass	-/-/2B.2	This species occurs in slow-moving water, below 4,920 feet elevation.	July–October / Perennial herb	There are 2 CNDDDB records of water star-grass in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where freshwater emergent wetlands are present in Marin and San Francisco Counties.
Potamogetonaceae – Pondweed Family					
<i>Potamogeton zosteriformis</i> Eel-grass pondweed	-/-/2B.2	This species occurs in ponds, lakes, streams, and marsh below 6,100 feet elevation.	June–July / Annual herb	There is 1 CNDDDB record of eel-grass pondweed in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where perennial lakes and ponds are present in Contra Costa County.
<i>Stuckenia filiformis</i> ssp. <i>alpina</i> Slender-leaved pondweed	-/-/2B.2	This species occurs in the shallow, clear water of lakes and drainage channels; 985 to 7,055 feet elevation.	May–July / Perennial herb	There are 7 CNDDDB records of slender-leaved pondweed in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where perennial lakes and ponds are present in Sonoma, Solano, Contra Costa, Alameda, and San Mateo Counties.
Primulaceae – Primrose Family					
<i>Androsace elongata</i> ssp. <i>acuta</i> California androsace	-/-/4.2	This species occurs on moss-covered rock outcrops and open areas in adjacent grasslands from 490 to 4,280 feet elevation.	March–June / Annual herb	Based on herbarium records, there are about 16 occurrences of California androsace in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland in shallow soil is present in Contra Costa, Alameda, and Santa Clara Counties.
Pteridaceae – Brake Family					
<i>Aspidotis carlotta-halliae</i> Carlotta Hall’s lace fern	-/-/4.2	This species occurs in crevices of serpentine outcrops from 330 to 4,595 feet elevation.	January–December / Perennial herb	Based on herbarium records, there are about 8 occurrences of Carlotta Hall’s lace fern in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral and closed-cone pine-cedar forest is present in Marin, Alameda, and Santa Clara Counties.

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Ranunculaceae – Buttercup Family					
<i>Delphinium bakeri</i> Baker’s larkspur	E/R/1B.1	This species occurs in coastal scrub, broadleafed upland forest, and valley and foothill grassland from 260 to 1,000 feet elevation.	March–May / Perennial herb	There are 6 CNDDDB records of Baker’s larkspur in the study area.	Absent. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Marin and Sonoma Counties (ICF 2016).
<i>Delphinium californicum</i> ssp. <i>interius</i> Hospital Canyon larkspur	–/–/1B.2	This species occurs in moist ravines and slopes in woodlands, chaparral, and coastal scrub from 640 to 3,575 feet elevation.	April–June / Perennial herb	There are 22 CNDDDB records of Hospital Canyon larkspur in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Contra Costa, Alameda, and Santa Clara Counties.
<i>Delphinium luteum</i> Yellow larkspur	E/R/1B.1	This species occurs in rocky areas in coastal scrub, coast prairie, and chaparral below 330 feet elevation.	March–May / Perennial herb	There are 11 CNDDDB records of yellow larkspur in the study area.	Absent. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Marin and Sonoma Counties (ICF 2016).
<i>Delphinium recurvatum</i> Recurved larkspur	–/–/1B.2	This species occurs in subalkaline soils in annual grassland and saltbush scrub from 10 to 2,590 feet elevation.	March–May / Perennial herb	There are 5 CNDDDB records of recurved larkspur in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where annual grassland on alkaline soils or alkali desert scrub is present in Alameda, Contra Costa, and Solano Counties.
<i>Delphinium uliginosum</i> Swamp larkspur	–/–/4.2	This species occurs in open meadows and stream banks in serpentine chaparral from 1,310 to 1,970 feet elevation.	May–June / Perennial herb	Based on herbarium records, there are about 12 occurrences in the study area.	Potential to occur. Potential habitat for this species occurs where seeps or wet meadows are present in serpentine chaparral in Sonoma and Napa Counties.
<i>Myosurus minimus</i> ssp. <i>apus</i> Little mousetails	–/–/3.1	This species occurs in open meadows and stream banks in serpentine chaparral from 1,310 to 1,970 feet elevation.	March–June / Annual herb	There are 2 herbarium records of little mousetails in the study area.	Potential to occur. Potential habitat for this species occurs where vernal pools are present in Contra Costa County.
<i>Ranunculus lobbii</i> Lobb’s aquatic buttercup	–/–/4.2	This species occurs in vernal pools and other wetlands in North Coast coniferous forest, woodlands below 1,640 feet elevation.	February–May / Annual herb	There are 89 herbarium records of Lobb’s aquatic buttercup in the study area.	Potential to occur. Potential habitat for this species occurs where vernal pools are present in the study area.
Rhamnaceae – Buckthorn Family					
<i>Ceanothus confusus</i> Rincon Ridge ceanothus	–/–/1B.1	This species occurs in volcanic or serpentine substrates in chaparral, closed-cone coniferous forests, and cis-montane woodlands from 245 to 3,480 feet elevation.	February–June / Perennial shrub	There are 28 CNDDDB records of Rincon Ridge ceanothus in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Napa and Sonoma Counties.
<i>Ceanothus decornutus</i> Nicasio ceanothus	–/–/1B.2	This species occurs in maritime chaparral, on serpentinite outcrops from 770 to 970 feet elevation.	March–May / Perennial shrub	There are 2 CNDDDB records of Nicasio ceanothus in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where mixed chaparral is present in Marin County.
<i>Ceanothus divergens</i> Calistoga ceanothus	–/–/1B.2	This species occurs on rocky serpentinite or volcanic substrates in chaparral from 560 to 3,115 feet elevation.	February–April / Perennial shrub	There are 22 CNDDDB records of Calistoga ceanothus in the study area.	Likely to occur. The Permit Area intersects 12 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Napa and Sonoma Counties.
<i>Ceanothus ferrisiae</i> Coyote ceanothus	E/–/1B.1	This species occurs in grassland, coastal scrub, and chaparral from 395 to 1,510 feet elevation.	January–May / Perennial shrub	There are 4 CNDDDB records of coyote ceanothus in the study area.	Present. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Santa Clara County (ICF 2016).
<i>Ceanothus foliosus</i> var. <i>vineatus</i> Vine Hill ceanothus	–/–/1B.1	This species occurs in chaparral from 150 to 1,000 feet elevation.	March–May / Perennial shrub	There are 4 CNDDDB records of Vine Hill ceanothus in the study area.	Likely to occur. The Permit Area intersects 4 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Sonoma County.
<i>Ceanothus gloriosus</i> var. <i>exaltatus</i> Glory brush	–/–/4.3	This species occurs on sandy or rocky substrates below 1,640 feet elevation.	March–May / Perennial shrub	There are 42 herbarium records of glory brush in the study area.	Potential to occur. Potential habitat for this species occurs where mixed chaparral is present in Sonoma and Marin Counties.
<i>Ceanothus gloriosus</i> var. <i>gloriosus</i> Point Reyes ceanothus	–/–/4.3	This species occurs in coastal bluffs, Bishop pine forest, in sandy soils below 1,640 feet elevation.	March–May / Perennial shrub	There are 23 herbarium records of Point Reyes ceanothus in the study area.	Potential to occur. Potential habitat for this species occurs where mixed chaparral is present in Sonoma and Marin Counties.
<i>Ceanothus gloriosus</i> var. <i>porrectus</i> Mt. Vision ceanothus	–/–/1B.3	This species occurs in grassland, coastal prairie, coastal scrub, and Bishop pine forest, on sandy soils, from 80 to 1,000 feet elevation.	February–May / Perennial shrub	There are 18 CNDDDB records of Mt. Vision ceanothus in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Marin County.

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<i>Ceanothus masonii</i> Mason’s ceanothus	–/–/1B.2	This species occurs in chaparral, on serpentine ridges and slopes from 755 to 1,640 feet elevation.	March–April / Perennial shrub	There are 8 CNDDDB records of Mason’s ceanothus in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Marin County.
<i>Ceanothus purpureus</i> Holly-leaved ceanothus	–/–/1B.2	This species occurs on rocky, volcanic soil, in chaparral and oak woodland from 475 to 2,560 feet elevation.	February–June / Perennial shrub	There are 43 CNDDDB records of holly-leaved ceanothus in the study area.	Likely to occur. The Permit Area intersects 17 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Napa, Sonoma, and Solano Counties.
<i>Ceanothus rigidus</i> Monterey ceanothus	–/–/4.2	This species occurs on sandy soils, in chaparral and closed-cone pine forest below 1,310 feet elevation.	March–May / Perennial shrub	There are 3 CNDDDB records of Monterey ceanothus in the study area.	Potential to occur. Potential habitat for this species occurs where mixed chaparral is present in Marin and San Mateo Counties.
<i>Ceanothus sonomensis</i> Sonoma ceanothus	–/–/1B.2	This species occurs in sandy, volcanic, or serpentine substrates in chaparral from 705 to 2,625 feet elevation.	February–April / Perennial shrub	There are 43 CNDDDB records of Sonoma ceanothus in the study area.	Likely to occur. The Permit Area intersects 15 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Napa and Sonoma Counties.
Rosaceae – Rose Family					
<i>Horkelia cuneata</i> ssp. <i>sericea</i> Kellogg’s horkelia	–/–/1B.1	This species occurs in coastal scrub and maritime chaparral, in sandy and gravelly places, from 35 to 655 feet elevation.	April– September / Perennial herb	There are 10 CNDDDB records of Kellogg’s horkelia in the study area.	Likely to occur. The Permit Area intersects 8 occurrences of this species. Potential habitat for this species occurs where coastal scrub or mixed chaparral is present in Marin, San Francisco, San Mateo, and Alameda Counties.
<i>Horkelia marinensis</i> Point Reyes horkelia	–/–/1B.2	This species occurs in coastal dunes, coastal scrub, and perennial grassland from 15 to 2,475 feet elevation.	May–September / Perennial herb	There are 15 CNDDDB records of Point Reyes horkelia in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where dunes, coastal scrub or perennial grassland is present in Marin, San Mateo, and Sonoma Counties.
<i>Horkelia tenuiloba</i> Thin-lobed horkelia	–/–/1B.2	This species occurs in moist areas in chaparral from 165 to 1,640 feet elevation.	May–July / Perennial herb	There are 16 CNDDDB records of thin-lobed horkelia in the study area.	Likely to occur. The Permit Area intersects 5 occurrences of this species. Potential habitat for this species occurs where chaparral is present in Marin and Sonoma Counties.
<i>Potentilla hickmanii</i> Hickman’s cinquefoil	E/E/1B.1	This species occurs in freshwater marshes, seeps, and in small streams in open areas in coastal scrub or forest from 35 to 490 feet elevation.	April–August / Perennial herb	There are 2 CNDDDB records of Hickman’s cinquefoil in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where freshwater emergent wetland is present in San Mateo County.
<i>Potentilla uliginosa</i> Cunningham Marsh cinquefoil	–/–/1A	This species occurs in freshwater marsh from 100 to 130 feet elevation.	May–August / Perennial herb	There is 1 CNDDDB records of Cunningham Marsh cinquefoil in the study area.	Unlikely to occur. The Permit Area intersects 1 occurrence of this species; however, the only known occurrence of this species is possibly extirpated. Potential habitat for this species occurs where freshwater emergent wetland is present in Sonoma County.
Rubiaceae – Madder Family					
<i>Galium andrewsii</i> ssp. <i>gatense</i> Serpentine bedstraw	–/–/4.2	This species occurs in serpentine chaparral, woodlands, in open rocky places from 720 to 4,755 feet elevation.	April–June / Perennial herb	There are 25 herbarium records of serpentine bedstraw in the study area.	Potential to occur. Potential habitat for this species occurs where serpentine chaparral is present in Contra Costa, Alameda, and Santa Clara Counties.
Scrophulariaceae – Figwort Family					
<i>Limosella australis</i> Delta mudwort	–/–/2B.1	This species occurs in marshes and swamps below 10 feet elevation.	May–August / Perennial herb	There are 25 CNDDDB records of Delta mudwort in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where high elevation tidal marsh is present in Solano and Contra Costa Counties.
Themidaceae – Brodiaea Family					
<i>Brodiaea leptandra</i> Narrow-flowered brodiaea	–/–/1B.2	This species occurs in broadleafed upland forest, chaparral, and lower montane coniferous forest from 360 to 3,000 feet elevation.	June–July / Perennial herb	There are 39 CNDDDB records of narrow-flowered brodiaea in the study area.	Likely to occur. The Permit Area intersects 24 occurrences of this species. Potential habitat for this species occurs where mixed chaparral is present in Napa and Sonoma Counties.
<i>Triteleia lugens</i> Dark-mouthed triteleia	–/–/4.3	This species occurs in open areas in chaparral, foothill woodlands, broadleaved evergreen forest, and lower montane coniferous forest, from 330 to 3,280 feet elevation.	April–June / Perennial herb	There are about 6 herbarium records of dark-mouthed triteleia in the study area.	Potential to occur. Potential habitat for this species occurs where annual grassland or grassy areas in chaparral and montane hardwood-conifer forest is present in Napa and Solano Counties.
Thymelaeaceae – Mezereum Family					
<i>Dirca occidentalis</i> Western leatherwood	–/–/1B.2	This species occurs in chaparral, forest, and woodland habitats from 150 to 1,395 feet elevation.	January–April / Perennial shrub	There are 75 CNDDDB records of western leatherwood in the study area.	Likely to occur. The Permit Area intersects 35 occurrences of this species. Potential habitat for this species occurs where chaparral, woodland or forest habitat is present in Sonoma, Marin, San Mateo, Contra Costa, Alameda, and Santa Clara Counties.

Species Name	Status ^a Federal/State/ CRPR	Habitat Requirements	Flowering Phenology/ Life Form	Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
Verbenaceae – Vervain Family					
<i>Abronia umbellata</i> ssp. <i>breviflora</i> Pink sand-verbena	–/–/1B.2	This species occurs in coastal dunes below 35 feet elevation.	June–October / Perennial herb	There are 16 CNDDDB records of pink sand-verbena in the study area.	Likely to occur. The Permit Area intersects 3 occurrences of this species. Potential habitat for this species occurs where dunes are present in Sonoma and Marin Counties.
Bryophyta – Mosses					
<i>Anomobryum julaceum</i> Slender silver moss	–/–/4.2	This species occurs in broadleafed upland forest, lower montane coniferous forest, and North Coast coniferous forest from 330 to 3,300 feet elevation.	N/A / Moss	There are 2 CNDDDB records of slender silver moss in the study area.	Likely to occur. The Permit Area intersects 2 occurrences of this species. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Sonoma and Contra Costa Counties.
<i>Entosthodon kochii</i> Koch’s cord moss	–/–/1B.3	This species occurs in cismontane woodlands on river banks, from 606 to 1,200 feet elevation.	N/A / Moss	There is 1 CNDDDB record of Koch’s cord moss in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Marin County.
<i>Fissidens pauperculus</i> Minute pocket-moss	–/–/1B.2	This species occurs in North Coast coniferous forest, on stream banks and in dry streambeds from 35 to 3,920 feet elevation.	N/A / Moss	There are 7 CNDDDB records of minute pocket-moss in the study area.	Likely to occur. The Permit Area intersects 6 occurrences of this species. Potential habitat for this species occurs where valley/foothill riparian habitat is present in Sonoma, Marin, San Mateo, and Alameda Counties.
<i>Grimmia torenii</i> Toren’s grimmia	–/–/1B.3	This species occurs in lower montane coniferous forest, woodlands, and open areas in chaparral, on boulders and rock walls, from 1,065 to 8,805 feet elevation.	N/A / Moss	There are 3 CNDDDB records of Toren’s grimmia in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where chaparral or montane hardwood-conifer forest is present in Contra Costa and San Mateo Counties.
<i>Mielichhoferia elongata</i> Elongate copper moss	–/–/2B.2	This species occurs in cismontane woodland, in vernally moist areas on metamorphic rock from 1,640 to 4,264 feet elevation.	N/A / Moss	There is 1 CNDDDB record of elongate copper moss in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where oak woodland is present in Marin County.
<i>Orthotrichum kellmanii</i> Kellman’s bristle moss	–/–/1B.2	This species occurs in chaparral and woodlands, on sandstone outcrops from 1,115 to 2,245 feet elevation.	N/A / Moss	There is 1 CNDDDB record of Kellman’s bristle moss in the study area.	Potential to occur. The Permit Area does not intersect any occurrences of this species. Potential habitat for this species occurs where chaparral or oak woodland is present in San Mateo County.
<i>Triquetrella californica</i> California triquetrella moss	–/–/1B.2	This species occurs in coastal scrub from 35 to 330 feet elevation.	N/A / Moss	There are 10 CNDDDB records of California triquetrella moss in the study area.	Likely to occur. The Permit Area intersects 9 occurrences of this species. Potential habitat for this species occurs where coastal scrub is present in Sonoma, Marin, San Francisco, San Mateo, and Contra Costa Counties.
Lichenophyta – Lichens					
<i>Bryoria spiralifera</i> Twisted horsehair lichen	–/–/1B.2	This species occurs in North Coast coniferous forest, on conifers below 100 feet elevation.	N/A / Fruticose lichen (epiphytic)	There are no CNDDDB occurrence records for twisted horsehair lichen in the study area.	Potential to occur. Potential habitat for this species occurs where mixed chaparral, coastal oak woodland, or closed-cone pine-cypress forest is present in the study area.
<i>Ramalina thaustra</i> Angel’s-hair lichen	–/–/2B.1	This species occurs in North Coast coniferous forest, on dead twigs from 245 to 1,410 feet elevation.	N/A / Fruticose lichen (epiphytic)	There is 1 CNDDDB record of angel’s-hair lichen in the study area.	Likely to occur. The Permit Area intersects 1 occurrence of this species. Potential habitat for this species occurs where montane hardwood-conifer forest is present in Sonoma County.
<i>Thamnolia vermicularis</i> Whiteworm lichen	–/–/2B.1	This species occurs in coastal grassland, on sandstone outcrops near sea level.	N/A / Fruticose lichen (terricolous)	There is 1 CNDDDB record of whiteworm lichen in the study area.	Likely to occur. The Permit Area does not intersect any occurrence of this species. Potential habitat for this species occurs where perennial grassland is present in Marin County.
<i>Usnea longissima</i> Methuselah’s beard lichen	–/–/4.2	This species occurs in North Coast coniferous forest and broadleafed upland forest; below 2,000 feet elevation	N/A / Fruticose lichen (epiphytic)	There are 17 CNDDDB records of Methuselah’s beard lichen in the study area.	Likely to occur. The Permit Area intersects 10 occurrences of this species. Potential habitat for this species occurs where oak woodland, montane hardwood-conifer forest, or Douglas-fir forest is present in Sonoma County.

Species Name	Status ^a Federal/State/ CRPR	Habitat Requirements	Flowering Phenology/ Life Form	Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
^a Status explanations: Federal E = listed as endangered under the federal Endangered Species Act. T = listed as threatened under the federal Endangered Species Act. - = no listing. State E = listed as endangered under the <u>Native Plant Protection Act and/or</u> California Endangered Species Act. <u>R = listed as rare under the Native Plant Protection Act</u> T = listed as threatened under the California Endangered Species Act. - = no listing. California Rare Plant Rank (CRPR) 1A = presumed extinct in California extirpated or extinct because the species has not been seen or collected in the wild in California for many years. A plant that is considered extirpated from California has been eliminated from California but may still occur elsewhere in its range. 1B = rare, threatened, or endangered in California and elsewhere. 2 = rare, threatened, or endangered in California but more common elsewhere. 3 = more information is needed about this plant. 4 = limited distribution, species on a watch list. California Native Plant Society Code Extensions (threat rankings) 0.1 = seriously endangered in California (more than 80% of occurrences threatened / high degree and immediacy of threat). 0.2 = fairly endangered in California (20–80% of occurrences threatened).					
N/A = Not applicable (i.e., non-flowering moss or lichen)					

Table 3.4-4. Special-Status Wildlife Species’ Probability of Occurrence in the Permit Area

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
Invertebrates				
<i>Branchinecta longiantenna</i> Longhorn fairy shrimp	FE	Found in small, shallow vernal pools, which range in depth from 2 to 12 inches and in water temperature from 50 to 68°F; vernal pools on chaparral covered mesas, ditches, road ruts.	Eastern margin of central Coast Ranges from Contra Costa County to San Luis Obispo County; disjunct population in Madera County; Altamont Pass area; Soda Lake on the Carrizo Plain; Kesterson National Wildlife Refuge.	Potential to occur. Suitable habitat is present in eastern portion of the Permit Area, northeast of Livermore, where only 2 occurrences have been documented in the Byron Hot Springs Quadrangle.
<i>Branchinecta conservatio</i> Conservancy fairy shrimp	FE	Large, deep vernal pools in annual grasslands.	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, Placer, and Glenn Counties; Central Valley.	Likely to occur. Suitable habitat is present in the northeast portion of the Permit Area; 13 occurrences have been documented in the Antioch North, Denverton, and Elmira Quadrangles, with most occurrences east of Travis Air Force Base.
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FT	Inhabits ephemeral pools (vernal pools) in grassland or basalt flow depressions. Pools typically have grass or mud bottoms. Also occurs in other wetlands with habitat characteristics similar to those of vernal pools, including alkaline rain-pools, rock outcrop pools, and some constructed sites. Occupied habitats range from puddles of 6 square feet to pools exceeding 25 acres. Pools must stay inundated long enough (3 weeks under optimal conditions) for the species to complete its life cycle, but species does not use riverine, marine, or other permanent waters.	From Shasta County in the north throughout the Central Valley to Tulare County and west to the central Coast Ranges. Disjunct populations occur in San Luis Obispo, Santa Barbara, and Riverside Counties. Most known locations are in the Sacramento and San Joaquin Valleys and along the east margin of the central Coast Ranges.	Likely to occur. Suitable habitat is present in the eastern portions of the Permit Area, where 55 occurrences have been documented, mainly around Travis Air Force Base.
<i>Lepidurus packardii</i> Vernal pool tadpole shrimp	FE	Found in grass-bottomed swales on old alluvial soils underlain by hardpan, and in mud-bottomed pools with highly turbid water. Occupied habitats range in size from 50 square feet to 89 acres. Pools must dry out and re-inundate for cysts to hatch. Adult populations generally persist until the habitat dries up.	Endemic to Central Valley. Most populations occur in the Sacramento Valley. Also reported from the Sacramento River Delta to the east side of San Francisco Bay, and from scattered localities in the San Joaquin Valley from San Joaquin County to Merced County.	Likely to occur. Suitable habitat is present in the Permit Area. A total of 30 occurrences have been documented in the northeast and southeast portions of the study area; most records are from east of Travis Air Force Base, with a few located near Fremont.
<i>Syncaris pacifica</i> California freshwater shrimp	FE SE	In pool areas of low-elevation, low-gradient, permanent streams; among live tree roots of undercut banks, under overhanging woody debris or vegetation.	Endemic to Marin, Napa, and Sonoma Counties; extant populations in Lagunitas Creek in Marin County, Huichica Creek in Napa County, and Franz, East Austin, Sonoma, and Salmon Creeks in Sonoma County; tributary streams in the lower Russian River drainage, coastal streams flowing into the Pacific, streams draining into Tomales Bay, and those draining into Northern San Pablo Bay.	Likely to occur. Suitable habitat is present in the Permit Area; 20 occurrences have been documented in Napa and Sonoma Counties.
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT	Hosted by elderberry shrubs (<i>Sambucus</i> spp.) in riparian forests and adjacent uplands that may also include cottonwoods (<i>Populus</i> spp.), willows (<i>Salix</i> spp.), ashes (<i>Fraxinus</i> spp.), oaks (<i>Quercus</i> spp.), and walnuts (<i>Juglans</i> spp.). Found in many different plant communities where elderberries grow but is most common in riparian woodlands and savannas, possibly because of the greater concentration of elderberries in these areas.	Throughout the Central Valley and foothills from the northern border of Shasta County to southern Kern County, and from the watershed of the Central Valley in the west to approximately 3,000 feet above sea level in the Sierra Nevada foothills.	Likely to occur. Suitable habitat is present in the Permit Area; 12 occurrences have been documented in Solano County.
<i>Elaphrus viridis</i> Delta green ground beetle	FT	Sparsely vegetated edges of vernal lakes and pools; occurs up to 250 feet from pools.	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve, Solano County.	Potential to occur. Suitable habitat is present in the Permit Area; 6 occurrences have been documented in the Dozier, Denverton, and Elmira Quadrangles on the northeastern portion of the study area, east of Travis Air Force Base.
<i>Euphydryas editha bayensis</i> Bay checkerspot butterfly	FT	Native grasslands on outcrops of serpentine soil; California plantain and owl’s clover are host plants.	Vicinity of San Francisco Bay including San Francisco Peninsula in San Mateo County, and mountains near San Jose, Santa Clara County.	Likely to occur. Suitable habitat is present in the Permit Area; 13 occurrences have been documented from Santa Clara to Morgan Hill in Santa Clara County.
<i>Callophrys mossii bayensis</i> San Bruno elfin butterfly	FE	North-facing slopes and ridges facing Pacific Ocean from 600 to 1,100 feet elevation; rocky outcrops and cliffs in coastal shrub.	San Bruno Mountain, Montara Mountain, and northern end of Santa Cruz Mountains, San Mateo County; San Francisco Bay area, Contra Costa County, Marin County.	Potential to occur. Suitable habitat is present in the Permit Area; 6 occurrences have been documented along coastal ridges in San Mateo County.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Icaricia icarioides missionensis</i> Mission blue butterfly	FE	Hill and ridgetops, as well as slopes with south exposure with caterpillar food plants, <i>Lupinus</i> spp.	San Bruno Mountain, San Mateo County; Twin Peaks, San Francisco County; Fort Baker, Marin County.	Likely to occur. Suitable habitat is present in the Permit Area; 11 occurrences have been documented in the San Francisco South and Montara Mountain Quadrangles of San Francisco and San Mateo Counties.
<i>Apodemia mormo langei</i> Lange’s metalmark butterfly	FE	Occurs in dense to moderately dense patches of food plant, wild buckwheat, in stabilized sand dunes.	Once found throughout the Antioch Dunes; range now reduced to less than 10 acres of Antioch Dunes in Contra Costa County.	Potential to occur. Suitable habitat is present in the Permit Area. Only 1 occurrence has been documented in the Antioch North Quadrangle in northeast Contra Costa County, near Antioch.
<i>Speyeria callippe</i> Callippe silverspot butterfly	FE	Open hillsides where wild pansy (<i>Viola pendunculata</i>) grows; larvae feed on Johnny jump-up plants, whereas adults feed on native mints and nonnative thistles.	San Bruno Mountain, San Mateo County, and a single location in Alameda County; Contra Costa County.	Potential to occur. Suitable habitat is present in the Permit Area; 11 occurrences have been documented in the Cordelia, Benicia, Fairfield South, and San Francisco South Quadrangles in Solano and San Mateo Counties.
<i>Speyeria zerene behrensii</i> Behren’s silverspot butterfly	FE	Habitats with larval food sources (blue violets) are required; coastal terrace prairie.	Pacific side of the Coast Ranges from Point Arena, Mendocino County, to Cape Mendocino, Humboldt County.	Unlikely to occur. Suitable coastal habitat is present in the Permit Area but the nearest known metapopulation occurs in Mendocino County, 13 miles outside of the study area.
<i>Speyeria zerene myrtleae</i> Myrtle’s silverspot butterfly	FE	Inhabits coastal terrace prairie, coastal bluff scrub, and associated nonnative grassland habitats where the larval foodplant, typically <i>Viola adunca</i> , occurs; coastal dunes and bluffs.	Historically known from San Mateo County north to the mouth of the Russian River in Sonoma County. No butterflies have been observed recently at the known population sites near Pacifica and San Mateo in San Mateo County; Marin County and southwestern Sonoma County.	Potential to occur. Suitable habitat is present in the Permit Area; 14 occurrences have been documented in the Drakes Bay, Tomales, Valley Ford, Bodega Head, and Duncans Mills Quadrangles in Marin and Sonoma Counties.
<i>Bombus crotchii</i> Crotch bumble bee	SCE	Found in open grassland and scrub habitats. Requires nectar and pollen sources, as well as access to underground nesting/overwintering sites (e.g., abandoned rodent burrows) or soft, disturbed soil under vegetative debris.	Known range is nearly the entire State of California, from the Pacific coast east to the Sierra Nevada and into extreme western Nevada.	Likely to occur. Suitable habitat is present in the Permit Area. Most records are from south and east of the Bay Area. There are 11 occurrences documented in the Permit Area.
<i>Bombus occidentalis</i> Western bumble bee	SCE	Found in open grassland and meadows. Requires nectar and pollen sources, as well as access to underground nesting/overwintering sites (e.g., abandoned rodent burrows) or soft, disturbed soil under vegetative debris.	In California, this species is considered to be limited to high-elevation sites in northern and coastal areas.	Likely to occur. Suitable habitat is present in the Permit Area where there are 91 occurrences recorded.
Fish				
<i>Oncorhynchus kisutch</i> Coho salmon – Central California Coast ESU	FT SE	Occurs in coastal streams with water temperatures less than 59°F. Need cool, clear water with instream cover. Spawn in tributaries to large rivers or streams directly connected to the ocean (Moyle 2002). Spawning primarily occurs from November to January but can extend into March under drought conditions (Shapovalov and Taft 1954).	The Central California Coast ESU of coho salmon extends from Punta Gorda south to Soquel Creek in Santa Cruz County, California (National Marine Fisheries Service 2010).	Potential to occur. Suitable habitat is present in the Permit Area; 16 occurrences have been documented in western Marin County.
<i>Hypomesus transpacificus</i> Delta smelt	FT	Occurs in tidal marshes connected to floodplains of wetlands and upland areas. Low salinity water near 68°F, highly turbid, oxygen saturated, with a low ratio of contaminants.	Occurs in San Francisco Estuary and the Sacramento/San Joaquin River Delta, Contra Costa, Sacramento, Solano, and Yolo Counties. Range is San Pablo Bay upstream to Verona on the Sacramento River and to Mossdale on the San Joaquin River.	Potential to occur. Suitable habitat is present in the Permit Area; 13 occurrences have been documented in the study area along the San Francisco Bay.
<i>Thaleichthys pacificus</i> Eulachon (smelt)	FT	Occurs in ocean waters except during spawning runs. During spawning they are often found in lower reaches of snowmelt-fed rivers with temperatures of 39–50°F.	Range is from northern California to southwest Alaska and into the southeast Bering Sea. Inland most originate in the Columbia River Basin but has also been identified in the Sacramento River, Russian River, Humboldt Bay, and Klamath River in California.	Potential to occur. Suitable habitat is present in the Permit Area; however, only 1 occurrence has been documented in the San Quentin Quadrangle in the northwestern portion of the San Francisco Bay.
<i>Lavinia symmetricus parvipinnis</i> Gualala roach	SSC	Understanding of habitat requirements is lacking but it is assumed they are similar to those of Navarro roach.	Confined to the Gualala watershed and its tributaries.	Potential to occur. Species range borders the northwestern portion of the Permit Area; 4 occurrences have been documented in western Sonoma County.
<i>Mylopharodon conocephalus</i> Hardhead	SSC	Sacramento, San Joaquin, and Russian Rivers and tributaries (Moyle 2002).	Typically occurs in undisturbed, low- to mid-elevation streams and main stem Sacramento River and tributaries.	Potential to occur. Suitable habitat is present in the Permit Area; 2 occurrences have been documented in the Jimtown and San Francisco South Quadrangles of San Francisco County.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Spirinchus thaleichthys</i> Longfin smelt	FC ST	Occurs in nearshore waters to estuaries and lower portions of freshwater streams; requires water temperatures lower than 63–73°F (Moyle 2002).	Occurs in San Francisco Estuary and the Sacramento/San Joaquin River Delta, Humboldt Bay, and the estuaries of the Eel River and Klamath River offshore.	Potential to occur. Suitable habitat is present in the Permit Area; 23 occurrences have been documented throughout the San Francisco Bay.
<i>Lavinia symmetricus navarroensis</i> Navarro roach	SSC	Prefers pool habitats, with low water velocity, where it tends to be found throughout the water column (Moyle et al. 2015).	Confined to the Navarro River and its tributaries in California.	Potential to occur. Species range extends into the northern portion of the Permit Area; 2 occurrences have been documented in the Healdsburg and Mark West Springs Quadrangles of Sonoma County.
<i>Hysterocarpus traski pomo</i> Russian River tule perch	SSC	Requires clear, flowing water and abundant cover, such as beds of aquatic macrophytes, submerged tree branches, overhanging plants, and large boulders (Moyle et al. 2015).	Confined to the Russian River and its tributaries in Sonoma and Mendocino Counties in California.	Potential to occur. Suitable habitat is present in the Permit Area; 4 occurrences have been documented in the Jimtown, Healdsburg, and Guerneville Quadrangles of Sonoma County.
<i>Archoplites interruptus</i> Sacramento perch	SSC	Adapted for life in sloughs, slow moving rivers, and large lakes, including floodplain lakes, of the Central Valley (Crain and Moyle 2011).	Sacramento perch have been widely introduced outside their native range, mainly to alkaline waters where other game fishes generally do not survive. Within the study area, known to occur in Abbott’s Lagoon, Lagoon Valley Reservoir, and Jewel Lake (Moyle et al. 2015).	Potential to occur. Suitable habitat is present in the Permit Area; 3 occurrences have been documented in Contra Costa County.
<i>Pogonichthys macrolepidotus</i> Sacramento splittail	SSC	Backwater habitat that is shallow, low velocity, suitable temperature, and which has food availability.	Endemic to California’s Central Valley; largely confined to the Delta, Suisun Bay, Suisun Marsh, Napa River, Petaluma River, and other parts of the San Francisco Estuary, while spawning on upstream floodplains and channel edges (Moyle et al. 2004).	Potential to occur. Suitable habitat is present in the Permit Area; 12 occurrences have been documented in the study area along the northern portion of the San Francisco Bay.
<i>Oncorhynchus mykiss irideus</i> Steelhead, Central California Coast DPS	FT	Occurs in streams and rivers that are well-oxygenated and that provide cool, riverine habitat with water temperatures of 46–64°F (Moyle 2002). Habitat types are riffles, runs, and pools.	Riverine and stream habitat from just north of Ukiah in Mendocino County to just south of Aptos Creek in Santa Cruz County.	Potential to occur. Suitable habitat is present in the Permit Area; 28 occurrences have been documented in Napa, Sonoma, and Marin Counties.
<i>Oncorhynchus mykiss irideus</i> Steelhead, Central Valley DPS	FT	Occurs in streams and rivers that are well-oxygenated, and that provide cool, riverine habitat with water temperatures of 46–64°F (Moyle 2002). Habitat types are riffles, runs, and pools.	Riverine and stream habitat within the Sacramento-San Joaquin River drainages.	Potential to occur. Suitable habitat is present in the Permit Area; 3 occurrences have been documented in the northeast portion of Contra Costa County.
<i>Oncorhynchus mykiss irideus</i> Steelhead, South-Central California Coast DPS	FT	Occurs in streams and rivers that are well-oxygenated, and that provide cool, riverine habitat with water temperatures of 46–64°F (Moyle 2002). Habitat types are riffles, runs, and pools.	Riverine and stream habitat from just north of the Pajaro River in Santa Cruz County to just south of Arroyo Grande Creek in San Luis Obispo County.	Potential to occur. Suitable habitat is present in the Permit Area; 3 occurrences have been documented south and west of Gilroy, in Santa Clara County.
<i>Oncorhynchus tshawytscha</i> Chinook salmon, winter-run and spring-run of Sacramento River	FT ST	Occurs in cold streams and rivers that are clear and well-oxygenated. Optimum temperature for embryo survival is about 41–55°F (Moyle et al. 2008). Spawning occurs in streams and rivers with cobble and large gravel.	Sacramento River, tributary streams, and the Sacramento Delta.	Potential to occur. Suitable habitat is present in the Permit Area, through which the species is known to pass between the Sacramento River and the Pacific Ocean.
<i>Eucyclogobius newberryi</i> Tidewater goby	FE SSC	Generally found in benthic, brackish water in the lower stream reaches with fairly still water and low salinity (less than 12 parts per thousand). Prefers sandy substrate for breeding and areas with sparse vegetation.	Endemic to California, found primarily in waters of coastal lagoons, estuaries, and marshes. Found throughout its historic range (Smith River in Del Norte County to Agua Hedionda Lagoon in San Diego County), but resides at few locations. Absent from areas with steep coastlines and where streams do not form lagoons or estuaries.	Potential to occur. Suitable habitat is present in the Permit Area; 7 occurrences have been documented along the West Coast and 1 in the San Francisco Bay near the Oakland West Quadrangle.
<i>Lavinia symmetricus</i> Tomales roach	SSC	Primarily occurs in highly altered habitats that include warm, aggraded reaches with little riparian vegetation (e.g., Walker Creek).	Restricted to the western Marin County drainages of Lagunitas Creek and Walker Creek.	Potential to occur. Suitable habitat is present in the Permit Area; 4 occurrences have been documented in Marin County.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
Amphibians				
<i>Ambystoma californiense</i> California tiger salamander, Central California DPS	FT ST	Restricted to grasslands and low foothill regions that provide breeding habitat, including temporary ponds or pools, slower portions of streams, and some permanent waters. Unlikely to use permanent waters unless fish predators are absent. Requires dry-season refugia such as ground squirrel burrows within 1 mile of breeding sites.	Endemic to areas below 1,400 feet in the San Joaquin and Sacramento River valleys and bordering foothills. Also found in coastal valleys of central California. In the Central Valley, range extends from southern Sacramento County south to Tulare County.	Likely to occur. Suitable habitat is present in the Permit Area; 500 occurrences have been documented in Solano, Alameda, Contra Costa, and Santa Clara Counties.
<i>Ambystoma californiense</i> California tiger salamander, Sonoma County DPS	FE ST	Restricted to grasslands and low foothill regions that provide breeding habitat, including temporary ponds or pools, slower portions of streams, and some permanent waters. Unlikely to use permanent waters unless fish predators are absent. Requires dry-season refugia such as ground squirrel burrows within 1 mile of breeding sites.	Santa Rosa Plain in Sonoma County, California.	Likely to occur. Suitable habitat is present in the Permit Area; 79 occurrences have been documented in Sonoma County.
<i>Dicamptodon ensatus</i> California giant salamander	SSC	Coastal oak woodlands and coniferous forests. Adults are terrestrial but breed during the fall and spring in streams.	Outer Coast Ranges from near the southern border of Mendocino County south through Marin County, and the inner Coast Ranges in Napa, Sonoma, Lake, and Solano Counties. South of San Francisco Bay, occurs in the Santa Cruz Mountains in San Mateo, Santa Clara, and Santa Cruz Counties.	Likely to occur. Suitable habitat is present in the Permit Area; 113 occurrences have been documented in Marin, Sonoma, Napa, and San Mateo Counties.
<i>Aneides niger</i> Santa Cruz black salamander	SSC	Dry forests in the fog belt of the outer Coast Range. Found in or adjacent to streams in shallow water or leaf litter.	Woodlands in the Santa Cruz Mountains in western Santa Clara, northern Santa Cruz, and southernmost San Mateo Counties.	Potential to occur. Suitable habitat is present in the Permit Area; 38 occurrences have been documented in San Mateo and Santa Clara Counties.
<i>Taricha rivularis</i> Red-bellied newt	SSC	Primarily occurs in redwood forests along the coast, although the species also occurs in Douglas fir, tan oak, and madrone forests. Aquatic breeding habitat consists of moderate to fast-flowing mountain streams with rocky bottoms.	Coastal northern California in Sonoma, Lake, Mendocino, and southern Humboldt Counties, at elevations of 500–1,500 feet. One isolated population is known from the Stevens Creek watershed in Santa Clara County.	Likely to occur. Suitable habitat is present in the Permit Area; 59 occurrences have been documented in Sonoma and Santa Clara Counties.
<i>Spea hammondi</i> Western spadefoot	SSC	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands, also temporary rain pools.	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California; west of Sierran-desert range axis.	Potential to occur. Suitable habitat is present in the Permit Area; 4 occurrences have been documented in eastern Alameda County.
<i>Rana draytonii</i> California red-legged frog	FT SSC	Permanent and semi-permanent aquatic habitats, such as slow-moving streams or creeks and cold-water ponds, with emergent and submergent vegetation (shrubby riparian). May estivate in rodent burrows or dry mud cracks during dry periods.	Found along the coast and coastal mountain ranges of California from Mendocino County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County; elevation near sea level to about 4,900 feet.	Likely to occur. Suitable habitat is present in the Permit Area; 871 occurrences have been documented throughout all counties of the study area.
<i>Rana boylei</i> Foothill yellow-legged frog	SC	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.	Occurs in the Klamath, Cascade, North Coast, South Coast, Transverse, and Sierra Nevada Ranges up to approximately 6,000 feet.	Likely to occur. Suitable habitat is present in the Permit Area; 138 occurrences have been documented throughout Alameda, Contra Costa, Marin, Napa, Santa Clara, San Mateo, Solano, and Sonoma Counties.
Reptiles				
<i>Actinemys marmorata</i> Western pond turtle	SSC	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with some watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests. Overwintering habitat consists of mud bottoms in ponds or a variety of upland areas in riparian or coniferous forest habitats.	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada. Southwestern population occurs along the central coast of California east to the Sierra Nevada and along the southern California coast inland to the Mojave and Sonora Deserts; range overlaps with that of the northwestern pond turtle throughout the Delta and in the Central Valley; elevation of about sea level to 6,700 feet.	Likely to occur. Suitable habitat is present in the Permit Area; 327 occurrences have been documented throughout all counties of the study area.
<i>Chelonia mydas</i> Green sea turtle	FT	Tropical and subtropical waters along continental coasts and islands between 30° North and 30° South; typically, in open ocean convergence zones, nest on beaches, feed in coastal benthic zones.	Baja California to southern Alaska, but most commonly from San Diego south.	Absent. No suitable habitat present in the Permit Area.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Dermochelys coriacea</i> Leatherback sea turtle	FE	Adults are pelagic and migratory. Females nest on beaches in tropical latitudes. Known foraging habitat includes oceanic and nearshore waters in temperate and boreal latitudes.	Pacific Ocean from Alaska to Chile. The coast of California, Oregon, and Washington.	Absent. No suitable habitat is present in the Permit Area.
<i>Phrynosoma blainvillii</i> Coast horned lizard	SSC	Requires sandy or loose soil and abundant ant colonies for foraging; habitat ranges from exposed gravelly-sandy substrate in riparian woodlands to dry uniform chamise chaparral to annual grassland or saltbrush.	Although the current range is more fragmented, historically was found along the Pacific Coast from the Baja California border west of the deserts and the Sierra Nevada, north to the Bay Area, and inland as far north as Shasta Reservoir, and south into Baja California. Ranges up onto the Kern Plateau east of the crest of the Sierra Nevada. Occurs from sea level to 8,000 feet in elevation.	Potential to occur. Suitable habitat is present in the Permit Area; 16 occurrences have been documented in Alameda and Contra Costa Counties.
<i>Gambelia sila</i> Blunt-nosed leopard lizard	FE SE FP	Open habitats with scattered low bushes on alkali flats, and low foothills, canyon floors, plains, washes, and arroyos; substrates may range from sandy or gravelly soils to hardpan.	San Joaquin Valley from Stanislaus County through Kern County and along the eastern edges of San Luis Obispo, San Benito, Monterey, Santa Barbara, and Ventura Counties.	Unlikely to occur. Species range is primarily outside of the Permit Area; no CNDDB occurrences have been documented within the study area.
<i>Anniella pulchra</i> Northern California legless lizard	SSC	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 with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas, and dunes stabilized with bush lupine and mock heather often indicate suitable habitat. Uses surface objects such as rocks, boards, driftwood, and logs for cover.	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 about 5,100 feet.	Potential to occur. Suitable habitat is present in the Permit Area; 6 occurrences have been documented in Alameda and Contra Costa Counties.
<i>Thamnophis gigas</i> Giant garter snake	FT ST	Sloughs, canals, low-gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	Central Valley from the vicinity of Burrel in Fresno County north to Chico in Butte County; has been extirpated from areas south of Fresno; found at elevations from near sea level to 400 feet.	Potential to occur. Suitable habitat is present in the Permit Area; 10 occurrences have been documented in east Solano County.
<i>Arizona elegans occidentalis</i> California glossy snake	SSC	Occurs in arid scrub, grassland, and chaparral habitats, and rocky washes.	Occurs from the eastern part of the 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.	Potential to occur. Suitable habitat is present in the Permit Area; 5 occurrences have been documented in Alameda and Contra Costa Counties.
<i>Masticophis lateralis euryxanthus</i> Alameda whipsnake	FT ST	Valleys, foothills, and low mountains associated with northern coastal scrub or chaparral habitat; requires rock outcrops for cover and foraging. Also occurs in grassland areas near scrub and chaparral.	Restricted to Alameda, Contra Costa, San Joaquin, and Santa Clara Counties; fragmented into 5 disjunct populations throughout its range.	Likely to occur. Suitable habitat is present in the Permit Area; 138 occurrences have been documented. The occurrences are primarily in Contra Costa and Alameda Counties; 3 records are from Santa Clara County.
<i>Thamnophis sirtalis tetrataenia</i> San Francisco garter snake	FE SE fp	Favors densely vegetated ponds near open hillsides, lakes, slow-moving streams and marshy areas containing abundant vegetation, which it uses for cover; nearby upland habitat is important during fall and winter; requires upland habitat (south- or west-facing slopes) with suitable sites for basking.	Northern San Mateo County southward along the coast and the eastern slope of the Santa Cruz Mountains to the Santa Clara County line; near San Francisco Peninsula.	Likely to occur. Suitable habitat is present in the Permit Area; 36 occurrences have been documented in San Mateo County.
Birds				
<i>Pelecanus occidentalis californicus</i> California brown pelican	FP	Typically found in littoral ocean zones, just outside the surf line; nests on offshore islands.	Present along the entire coastline but does not breed north of Monterey County; extremely rare inland; regular breeders on Santa Barbara Island but range extends from Channel Islands National Park to Islas Los Coronados.	Unlikely to occur. Rarely nests inland; 1 occurrence of an offshore, communal roost has been documented in the Valley Ford Quadrangle outside of the study area.
<i>Gymnogyps californianus</i> California condor	FE SE FP	Requires large blocks of open savanna, grasslands, and foothill chaparral with large trees, cliffs, and snags for roosting and nesting; prefer remote hilly/mountainous regions with cliff sites and forest habitats.	Historically, coastal and rugged mountain ranges surrounding the southern San Joaquin Valley ranging from northern Los Angeles County to San Luis Obispo County in the western Sierra Nevada; currently, most individuals are in captive populations, but a few birds were recently released in the rugged portions of the Los Padres National Forest.	Unlikely to occur. Suitable habitat is present in the Permit Area; however, the study area is currently outside of the known range of the species.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Circus cyaneus</i> Northern harrier	SSC	Grasslands, meadows, marshes, and seasonal and agricultural wetlands and fields; prefers open habitats with adequate vegetative cover.	Occurs throughout lowland California. Has been recorded in fall at high elevations ranging from near sea level to at least 9,000 feet in Mono County; largely within coastal lowlands from Lake Earl in Del Norte County to Bodega Head in Sonoma County, but also inland at Lake Berryessa in Napa County.	Likely to occur. Suitable habitat is present in the Permit Area; 13 occurrences have been documented in Alameda, Contra Costa, Marin, Napa, and Solano Counties.
<i>Aquila chrysaetos</i> Golden eagle	FP BGEPA	Rolling foothills, mountain ranges, sage-juniper flats, and desert. Nests on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grassland, chaparral, and oak woodland with plentiful medium and large-sized mammals.	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as the Central Valley; ranges from sea level to around 11,500 feet.	Likely to occur. Suitable habitat is present in the Permit Area; 34 occurrences have been documented in Alameda, Contra Costa, Napa, Santa Clara, Solano, and Sonoma Counties,
<i>Haliaeetus leucocephalus</i> Bald eagle	SE FP BGEPA	In western North America, nests and roosts in coniferous forests, woodlands, grasslands, and wetland habitats within 1 mile of a lake, reservoir, stream, or the ocean; nests are normally built in upper canopy of large trees, such as conifers.	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, east of the Sierra Nevada south of Mono County, and some rangelands and coastal wetlands.	Likely to occur. Suitable habitat is present in the Permit Area; 7 occurrences have been documented in Alameda, Contra Costa, Napa, and Santa Clara Counties.
<i>Buteo swainsoni</i> Swainson's hawk	ST	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, lightly grazed pastures and crops, irrigated pastures, and grain fields.	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County.	Likely to occur. Suitable habitat is present in the Permit Area; 308 occurrences have been documented throughout Alameda, Contra Costa, Napa, Santa Clara, Solano, and Sonoma Counties.
<i>Elanus leucurus</i> White-tailed kite	FP	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands or cropland for foraging.	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.	Likely to occur. Suitable habitat is present in the Permit Area; 30 occurrences have been documented in Alameda, Contra Costa, Marin, Napa, Santa Clara, San Mateo, Solano, and Sonoma Counties.
<i>Falco peregrinus anatum</i> American peregrine falcon	FP	Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large prey populations; habitats vary from wetlands, woodlands, other forested habitats, and coastal habitats.	Permanent resident along the north and south Coast Ranges. May reside in the Cascade and Klamath Ranges and through the Sierra Nevada to Madera County during the summer. During winter, resides in the Central Valley south through the Transverse and Peninsular Ranges and the plains east of the Cascade Range.	Likely to occur. Suitable habitat is present in the Permit Area; 21 occurrences have been documented in Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, and Solano Counties.
<i>Rallus obsoletus</i> California Ridgway's rail	FE SE FP	Marshes around the San Francisco Bay and east through the Delta to Suisun Marsh.	Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickle-weed; feeds on mollusks removed from the mud in sloughs.	Likely to occur. Suitable habitat is present in the Permit Area; 72 occurrences have been documented in Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, and Sonoma Counties around the perimeter of San Francisco, San Pablo and Suisun Bays.
<i>Coturnicops noveboracensis</i> Yellow rail	SSC	Freshwater marshes, brackish marshes, coastal salt marshes with moist soil or low standing water, and grassy meadows; prefers densely vegetated marshes.	Historical records of nests in Mono County east of the Sierra Nevada and formerly Marin County on the coast; also records from winter, on the coast from Humboldt County to Orange County, where the Central Valley merges with the San Francisco Bay estuary.	Likely to occur. Suitable habitat is present in the Permit Area; 7 occurrences have been documented in Alameda, Contra Costa, Marin, Santa Clara, San Mateo, Solano, and Sonoma Counties.
<i>Laterallus jamaicensis coturniculus</i> California black rail	ST FP	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations.	Permanent resident in the San Francisco Bay and east-ward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties.	Likely to occur. Suitable habitat is present in the Permit Area; 98 occurrences have been documented in all counties of the study Area.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Grus canadensis</i> Lesser sandhill crane	SSC	Forages primarily in croplands with waste grain; also frequents grasslands and emergent wetlands.	Does not breed in California; Winter range is concentrated in Merced County and the Sacramento-San Joaquin Delta. During winter, cranes also found regularly in Sacramento Valley, San Joaquin River National Wildlife Refuge, Tulare Basin, Carrizo Plain, and in smaller numbers in southern California south of the Salton Sea.	Potential to occur. Suitable foraging habitat and known winter roost sites present in the eastern portion of the study area.
<i>Grus canadensis tabida</i> Greater sandhill crane	ST FP	Prefers wet meadows, marshes, shallow ponds, hayfields, and grain fields for nesting, feeding, and roosting; during summer, is typically found in open terrain near shallow lakes or freshwater marshes; in winter, typically found in agricultural fields near bodies of fresh water.	Breeds in Siskiyou, Modoc, Lassen, Plumas, and Sierra Counties. Winter resident of the Central Valley, southern Imperial County, Lake Havasu National Wildlife Refuge, and the Colorado River Indian Reserve.	Potential to occur. Suitable foraging habitat in the Permit Area and known winter roost sites present in the eastern portion of the study area.
<i>Charadrius alexandrinus nivosus</i> Western snowy plover	FT SSC	Coastal beaches above the normal high tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent. Inland, they require barren to sparsely vegetated ground at alkaline or saline lakes, reservoirs, ponds and riverine sand bars; also, along sewage, salt-evaporation, and agricultural wastewater ponds.	Nests along the entire coast of California from Del Norte to San Diego County adjacent to or near tidal waters, including along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries. Nests at inland lakes throughout northeastern, central, and southern California, including Mono Lake and Salton Sea.	Potential to occur. Suitable habitat is present in the Permit Area; 11 occurrences have been documented at the margins of the San Francisco Bay, in Alameda, Marin, Napa, Santa Clara, San Mateo, and Sonoma Counties.
<i>Charadrius montanus</i> Mountain plover	SSC	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grain fields.	Does not breed in California; in winter, found in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern, and Los Angeles Counties.	Potential to occur. Suitable habitat is present in the Permit Area; 4 occurrences have been documented in the Birds Landing Quadrangle of Solano County, in the northeastern portion the study area.
<i>Rynchops niger</i> Black skimmer	SSC	Nests on gravel bars and sandy beaches; forages in shallow, calm waters or on mud flats in estuaries; requires large areas of bare beach sufficiently isolated from terrestrial predators and other disturbances.	Common summer resident at the Salton Sea and coastal southern California; largest breeding population at Salton Sea, coastal Orange County, and south San Diego Bay.	Unlikely to occur. Suitable habitat is present in the Permit Area; however, only 2 occurrences have been documented in the study area, 1 each in Alameda and Santa Clara Counties.
<i>Sternula antillarum browni</i> California least tern	FE SE FP	Nests on sandy, upper ocean beaches, and occasionally uses sparsely vegetated mudflats; forages on adjacent surf line, estuaries, or the open ocean.	Nests on beaches along the San Francisco Bay and along the southern California coast from southern San Luis Obispo County south to San Diego County.	Likely to occur. Suitable habitat is present in the Permit Area; 10 occurrences have been documented near the San Francisco Bay in Alameda, Contra Costa, San Mateo, and Santa Clara Counties.
<i>Brachyramphus marmoratus</i> Marbled murrelet	FT SE	Occupies nearshore areas, estuaries, and sounds; uses mature, coastal coniferous forests for nesting; nearby coastal water for foraging; nests in conifer stands greater than 150 years old and may be found up to 35 miles inland; during winter, is found on subtidal and pelagic waters often well offshore.	Nesting sites from the Oregon border to Eureka and between Santa Cruz and Half Moon Bay; winter resident of nearshore and offshore waters along the entire California coastline.	Likely to occur. Suitable habitat is present in the Permit Area; 30 occurrences have been documented in San Mateo County.
<i>Coccyzus americanus</i> Western yellow-billed cuckoo	FT SE	Requires wide, dense riparian forests/woodlands with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley-oak riparian habitats where scrub jays are abundant; utilizes orchards adjacent to streams.	Nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers.	Unlikely to occur. Suitable habitat is present in the Permit Area; 2 occurrences have been documented in Sonoma and Solano Counties.
<i>Athene cunicularia</i> Western burrowing owl	SSC	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows; also found in coastal terrace prairies and sagebrush habitats.	Lowlands throughout south, central, and east California, including the Central Valley, northeastern plateau, southeastern deserts, and some coastal areas. Rare along the south coast.	Likely to occur. Suitable habitat is present in the Permit Area; 333 occurrences have been documented throughout the study area in Alameda, Contra Costa, Marin, Napa, Santa Clara, San Mateo, Solano, and Sonoma Counties.
<i>Strix occidentalis caurina</i> Northern spotted owl	FT ST	Dense old-growth or mature forests dominated by conifers with topped trees or oaks available for nesting crevices.	A permanent resident throughout its range; found in the North Coast, Klamath, and western Cascade Range from Del Norte County to Marin County.	Potential to occur. Suitable habitat in the Permit Area with a small population in Marin County.
<i>Asio otus</i> Long-eared owl	SSC	Nests in abandoned crow, hawk, or magpie nests, usually in dense riparian stands of willows, cottonwoods, live oaks, or conifers usually open or adjacent to grasslands, meadows, or shrublands; key habitat components are dense cover, suitable nest platforms, and open foraging areas.	Permanent resident east of the Cascade Range from Placer County north to the Oregon border, east of the Sierra Nevada from Alpine County to Inyo County. Scattered breeding populations along the coast and in southeastern California. During winter, may be found throughout the Central Valley and southeastern California.	Unlikely to occur. Suitable habitat is present in the Permit Area; 1 occurrence has been documented in the Mindego Hill Quadrangle in Santa Clara County.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Asio flammeus</i> Short-eared owl	SSC	Freshwater and salt marshes, lowland meadows, ungrazed grasslands and old pastures, and irrigated alfalfa or grain fields; needs dense tules or tall grass for nesting and daytime roosts.	Permanent resident along the Sierra Nevada north of Nevada County, in the plains east of the Cascades, and in Modoc and Mono County; small, isolated populations; occur in Great Basin region and locally in the Sacramento-San Joaquin River Delta, breeding in mainland southern California. Resident population in Suisun Marsh.	Potential to occur. Suitable habitat is present in the Permit Area; 4 occurrences have been documented in Alameda, Contra Costa, San Mateo, and Solano Counties.
<i>Progne subis</i> Purple martin	SSC	Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats. Also nests in vertical drainage holes under elevated freeways and highway bridges or lapsed lava tubes; distributed in (redwood) forest and woodland areas at low to intermediate elevations.	Coastal mountains of Humboldt County south to San Luis Obispo County, west slope of the Sierra Nevada, and northern Sierra and Cascade ranges. Absent from the Central Valley except in Sacramento. Isolated, local populations in southern California.	Likely to occur. Suitable habitat is present in the Permit Area; 6 occurrences have been documented in Napa, Santa Clara, and Sonoma Counties.
<i>Riparia</i> Bank swallow	ST	Nests in bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam, along streams, coastal bluffs, and sand/gravel pits.	Occurs along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American Rivers, in the Owens Valley; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou Counties. Small populations near the coast from San Francisco County to Monterey County.	Potential to occur. Suitable habitat is present in the Permit Area; 2 occurrences have been documented in the southern coastal area of the study area, in San Francisco and San Mateo Counties.
<i>Lanius ludovicianus</i> Loggerhead shrike	SSC	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches; also requires impaling sites for prey manipulation, which makes the eastern side of the Cascades and Sierra Nevada ideal.	Most abundant in portions of the Central Valley, Coast Ranges, and southeastern deserts; also found in the San Joaquin Valley, south-central and south coasts, and the southeastern deserts; resident and winter visitor in lowlands and foothills throughout California. Rare on coastal slope north of Mendocino County, occurring only in winter.	Potential to occur. Suitable habitat is present in the Permit Area; 6 occurrences have been documented in Alameda and Contra Costa Counties.
<i>Vireo bellii pusillus</i> Least Bell’s vireo	FE SE	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.	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.	Unlikely to occur. Suitable habitat is present in the Permit Area; 1 occurrence has been documented in the Chittenden Quadrangle, in Santa Clara County.
<i>Melospiza melodia maxillaris</i> Suisun song sparrow	SSC	Brackish and tidal marshes and channels supporting cattails, tules, various sedges, and pickleweed.	Restricted to the extreme western edge of the Delta, between the cities of Vallejo and Pittsburg near Suisun Bay.	Potential to occur. Suitable habitat is present in the Permit Area: 15 occurrences have been documented in Contra Costa and Solano Counties.
<i>Geothlypis trichas sinuosa</i> Saltmarsh common yellowthroat	SSC	Freshwater marshes in summer and salt or brackish marshes in fall and winter; requires tall grasses, tules, and willow thickets for nesting and cover.	Found only in the Bay Area in Marin, Napa, Sonoma, Solano, San Francisco, San Mateo, Santa Clara, and Alameda Counties; range includes coastal riparian and wetland areas of western Marin County, the tidal marsh system of San Pablo Bay, the tidal marsh system of southern San Francisco Bay, and coastal riparian and wetland areas in San Mateo County.	Likely to occur. Suitable habitat is present in the Permit Area; 51 occurrences have been documented throughout Alameda, Contra Costa, Marin, Napa, Santa Clara, San Mateo, Solano, and Sonoma Counties.
<i>Icteria virens</i> Yellow-breasted chat	SSC	Nests in dense riparian habitats with a well-developed shrub layer and an open canopy, dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines.	Summer resident and migrant in coastal California and Sierra Nevada foothills, east of the Cascades in northern California, along the Colorado River, and very locally inland in southern California; numerous in northwestern region of the state.	Potential to occur. Suitable habitat is present in the Permit Area; 2 occurrences have been documented, 1 each in Santa Clara and Solano Counties.
<i>Ammodramus savannarum</i> Grasshopper sparrow	SSC	Occurs in short to medium height dry grasslands with scattered shrubs in the Central Valley and foothills and south coast; found in prairies and pastures scattered in largely forested areas along North Coast.	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.	Potential to occur. Suitable habitat is present in the Permit Area; 6 occurrences have been documented in Alameda, Santa Clara, Solano, and Sonoma Counties.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Agelaius tricolor</i> Tricolored blackbird	SC	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; colonies found in silage and grain fields near dairies in the San Joaquin Valley; during winters, is found in grasslands and agricultural fields with low-growing vegetation.	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 and most extensively concentrated in and around the Sacramento-San Joaquin River Delta and coastal areas, including Monterey and Marin Counties.	Likely to occur. Suitable habitat is present in the Permit Area; 78 occurrences have been documented in portions of Alameda, Contra Costa, Marin, Napa, Santa Clara, Solano, and Sonoma Counties.
<i>Setophaga petechia</i> Yellow warbler	SSC	Nests in riparian areas with willows, cottonwoods, Oregon ash, or alders. Also nests in montane shrubs in open ponderosa pine and mixed conifer forest, and in montane chaparral.	Breeds throughout California except the Central Valley, the Mojave Desert region, and high altitudes in the Sierra Nevada. During winter, found along the Colorado River and in parts of Imperial and Riverside Counties.	Potential to occur. Suitable habitat is present in the Permit Area. There are records of 2 occurrences, 1 each in Alameda and Marin Counties.
<i>Melospiza melodia pusillula</i> Alameda song sparrow	SSC	Relatively large brackish marshes associated with pickleweed; may nest in tall vegetation or among the pickleweed.	Found only in marshes along the southern portion of the San Francisco Bay; confined to tidal salt marsh habitat located on the fringes of the south arm of San Francisco Bay east to El Cerrito, south to Alviso, and west to San Francisco.	Potential to occur. Suitable habitat is present in the Permit Area; 17 occurrences have been documented in Alameda, San Mateo, and Santa Clara Counties.
<i>Melospiza melodia</i> Song sparrow ("Modesto" population)	SSC	Found in saline emergent wetlands; uses tidal sloughs within pickleweed marshes; requires tall bushes (usually grindelia) along sloughs for cover, nesting, and songposts; forages over mudbanks and in the pickleweed.	Found in San Pablo Bay and around central coastal California and the Central Valley area.	Potential to occur. Suitable habitat is present in the Permit Area; 19 occurrences have been documented at the east end of the San Francisco Bay in Solano County.
<i>Melospiza melodia samuelis</i> San Pablo song sparrow	SSC	Found in saline emergent wetlands; uses tidal sloughs within pickleweed marshes; requires tall bushes (usually grindelia) along sloughs for cover, nesting, and songposts; forages over mudbanks and in the pickleweed.	Found in San Pablo Bay and around central coastal California and the Central Valley area.	Potential to occur. Suitable habitat is present in the Permit Area; 19 occurrences have been documented in Contra Costa, Marin, Napa, Solano, and Sonoma Counties.
Mammals				
<i>Sorex ornatus sinuosus</i> Suisun shrew	SSC	Tidal, salt, and brackish marshes containing pickleweed, grindelia, bulrushes, or cattails. Requires driftwood or other objects for nesting cover; contiguous upland habitats may provide important refuge during flooding of salt marshes.	Restricted to the north shore of San Pablo and Suisun Bays (both in Solano County), from Sonoma Creek and Tubbs Island, Sonoma County on the west, eastward to Grizzly Island, Solano County.	Potential to occur. Suitable habitat is present in the Permit Area; 4 occurrences have been documented in Sonoma and Solano Counties.
<i>Lasiurus blossevillii</i> Western red bat	SSC (WBWG-High)	Found primarily in riparian and wooded habitats. Occurs at least seasonally in urban areas. Day roosts in trees within the foliage. Found in fruit orchards and sycamore riparian habitats in the Central Valley.	Coastal areas from the Bay Area south, plus the Central Valley and surrounding foothills, with a limited number of records from southern California, extending as far east as western Riverside and central San Diego counties, upper Sacramento River near Dunsmuir, Siskiyou County.	Potential to occur. Suitable habitat is present in the Permit Area; 8 occurrences have been documented in Contra Costa, Marin, Napa, Solano, and Sonoma Counties.
<i>Corynorhinus townsendii</i> Townsend's big eared bat	SSC (WBWG-High)	Roosts in caves, tunnels, mines, buildings, and other cave-like spaces. Will night roost in more open settings, including under bridges.	Widespread throughout California, from low desert to mid-elevation montane habitats.	Potential to occur. Suitable habitat is present in the Permit Area; 67 observations have been documented in all counties of the study area.
<i>Myotis thysanodes</i> Fringed myotis	SSC (WBWG-High)	Found in a wide variety of habitats from low desert scrub to high elevation coniferous forests. Day and night roosts in caves, mines, trees, buildings, and rock crevices; has been found in mixed deciduous/coniferous forest and in both redwood and giant sequoia habitat.	Found the length of the state, from the coast (including Santa Cruz Island) to 5,900 feet in the Sierra Nevada. Records exist for the high desert and east of the Sierra Nevada; however, the majority of known localities are on the west side of the Sierra Nevada.	Potential to occur. Suitable habitat is present in the Permit Area; 5 observations have been documented in Napa, San Mateo, and Sonoma Counties.
<i>Antrozous pallidus</i> Pallid bat	SSC (WBWG-High)	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 and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts.	Occurs throughout California, except the high Sierra, from Shasta County to Kern County and the northwest coast, primarily at lower and mid elevations (up to 6,000 feet).	Likely to occur. Suitable habitat is present in the Permit Area; 35 occurrences have been documented in Alameda, Contra Costa, Napa, Santa Clara, San Mateo, and Sonoma Counties.
<i>Aplodontia rufa phaea</i> Point Reyes mountain beaver	SSC	North-facing slopes of ridges or gullies below 1,000 feet where there is abundant moisture, thick undergrowth of sword ferns and thimbleberries, and soft soil for burrowing.	Known only from the Point Reyes area of Marin County.	Potential to occur. Suitable habitat is present in the Permit Area; 9 CNDDB occurrences have been documented in western Marin County.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
<i>Aplodontia rufa nigra</i> Point Arena mountain beaver	SSC	North-facing, wooded slopes of ridges or gullies where there is abundant moisture, thick under-growth, and soft soil for burrowing.	Known only from Alder Creek in the Point Arena area of Mendocino County.	Absent. Permit Area is outside of the species range.
<i>Neotoma fuscipes annectens</i> San Francisco dusky-footed woodrat	SSC	Present in chaparral habitat and in forest habitats with a moderate understory.	West side of Mount Diablo to coast and San Francisco Bay; Monterey County.	Potential to occur. Suitable habitat is present in the Permit Area; 33 observations have been documented in areas surrounding the San Francisco Bay, in Alameda, Contra Costa, Santa Clara, and San Mateo Counties.
<i>Arborimus pomo</i> Sonoma tree vole	SSC	Inhabits coastal old-growth forests of Douglas-fir, redwood, or montane hardwood-conifer species.	Occurs along the North Coast Ranges from Mendocino County to the Oregon border, and in the coastal lowlands from the Klamath Mountains to Sonoma County.	Likely to occur. Suitable habitat is present in the Permit Area; 27 occurrences have been documented in Sonoma County.
<i>Microtus californicus sanpabloensis</i> San Pablo California vole	SSC	Restricted to salt marsh habitats; annual grassland, saline emergent wetland.	Known only from San Pablo Creek, near San Pablo Bay, Contra Costa County.	Unlikely to occur. Suitable habitat is present in the Permit Area. 8 CNDDB occurrences have been documented in the tidal zone, immediately northwest of Richmond in Contra Costa County.
<i>Reithrodontomys raviventris</i> Salt marsh harvest mouse	FE SE FP	Salt marshes with a dense plant cover of pickle-weed and fat hen; adjacent to an upland site.	San Francisco, San Pablo, and Suisun Bays; the Delta and Bay Area.	Likely to occur. Suitable habitat is present in the Permit Area; 142 occurrences have been documented in areas around the San Francisco Bay and in the northern portion of the study area, in Alameda, Contra Costa, Marin, Napa, Santa Clara, San Mateo, Solano, and Sonoma Counties.
<i>Zapus trinotatus orarius</i> Point Reyes jumping mouse	SSC	Moist, marshy coastal meadows with grasses and forbs, loose, humus-filled dark soils associated with coast redwood forests, thickets of deciduous woody vegetation along streams and seepage areas, and, less frequently, in grassy areas beneath open-canopied coniferous forests.	Confined to the Point Reyes and Marin Headlands Peninsulas in Marin County.	Potential to occur. Suitable habitat is present in the Permit Area; 5 occurrences have been documented in Marin County.
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	FE ST	Associated with grassland, scrub, valley oak woodland, row crops, irrigated and unirrigated pasture, orchards, and vineyards; often steppe or desert climates.	Principally occurs in the San Joaquin Valley and adjacent open foothills to the west, extending from Kern County north to Contra Costa County.	Likely to occur. Suitable habitat is present in the Permit Area; 42 occurrences have been documented in in Alameda, Contra Costa, and Santa Clara Counties.
<i>Pekania pennanti</i> Fisher, West Coast DPS	SC	Late successional coniferous forests and montane riparian habitats; areas without frequent deep, fluffy snow.	Coastal mountains from Del Norte County to Sonoma Counties, east through the Cascades to Lassen County, and south in the Sierra Nevada to Kern County.	Unlikely to occur. Although the historic range of this species extended into Marin County, the current range of this species is outside of the Permit Area.
<i>Taxidea taxus</i> American badger	SSC	Occurs in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, and mountain meadows near timberline; they require sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground.	Throughout California, except for the humid coastal forests of northwestern California in Del Norte and the northwestern Humboldt Counties.	Likely to occur. Suitable habitat is present in the Permit Area; 79 occurrences have been documented in all counties of the study area.
<i>Enhydra lutris nereis</i> Southern sea otter	FT FP	Coastal waters, typically within 1 kilometer of shoreline. Often associated with kelp beds; forage in rocky and soft-sediment communities or near the ocean floor.	Occurs approximately from the vicinity of Half Moon Bay south to Gaviota, California. Approximately 20 otters, including pups, are at San Nicolas Island as a result of translocation efforts to establish an experimental population; San Miguel Island.	Absent. No suitable habitat is present in the study area.
<i>Puma concolor</i> Mountain Lion, Central Coast ESU	SCT	Species is carnivorous and generally nocturnal. Known from irregular, rocky terrain and large areas of riparian vegetation. Dens in thickets or caves.	The Central Coast ESU occurs in mountainous areas, from the San Francisco Bay Area and south into southern California.	Potential to occur. Suitable habitat is present in the Permit Area.

Species Name	Listing Status ^a	Habitat/Life History	Distribution/Known Locations	Probability of Occurrence in at Least One Portion of the Permit Area
^a Explanation of federal and state listing codes: Federal listing codes: FE = Federally Endangered Species FT = Federally Threatened Species PT = Proposed Threatened Candidate E = Candidate Endangered Candidate T = Candidate Threatened DPS = Distinct Population Segment BGEPA = Bald and Golden Eagle Protection Act			California listing codes: SE = State-listed as Endangered ST = State-listed as Threatened FP = Fully Protected species SSC= Species of Special Concern SCE= State Candidate as Endangered SCT= State Candidate as Threatened Additional codes: WBWG = Western Bat Working Group High = Highest priority for conservation action	

Table 3.4-5. Designated Critical Habitat in the Study Area

Species with Critical Habitat in Study Area	Designation List Date	Total Critical Habitat in California (acres) ^a
Plant		
Franciscan manzanita	January 21, 2014	229
Soft bird's beak	May 14, 2007	2,276
Suisun thistle	May 14, 2007	2,052
Baker's larkspur	April 17, 2003	1,829
Yellow (golden) larkspur	April 17, 2003	2,523
Contra Costa wallflower	April 26, 1978	305
Contra Costa goldfields	June 18, 1997	14,730
Antioch Dunes evening primrose	April 26, 1978	305
Wildlife		
Conservancy fairy shrimp	February 10, 2006	161,786
Longhorn fairy shrimp	February 10, 2006	13,557
Vernal pool fairy shrimp	February 10, 2006	590,247
Vernal pool tadpole shrimp	February 10, 2006	228,785
Delta green ground beetle	August 8, 1980	969
Bay checkerspot butterfly	August 26, 2008	18,292
Delta smelt	January 18, 1995	818,953
Chinook salmon	March 23, 1999	2,663
Steelhead	January 2, 2006	8,861
Tidewater goby	November 20, 2000	12,058
California tiger salamander (Central California DPS)	August 10, 2004	199,107
California tiger salamander (Sonoma County DPS)	September 30, 2011	47,381
California red-legged frog	March 17, 2010	1,640,363
Alameda whipsnake	October 2, 2006	154,834
Western snowy plover	December 7, 1999	14,829
Marbled murrelet	May 24, 1996	597,071
Northern spotted owl	June 26, 1990	2,100,382

^a Critical habitat designations for individual species may overlap with one another in portions of the study area.

Wildlife Corridors

Wildlife corridors are defined as areas that connect suitable habitat for species movement or dispersal between multiple habitats in a region otherwise fragmented by developed or rugged terrain, changes in vegetation, or human disturbance. These corridors provide (but are not required to contain) sufficient habitat for all life history requirements of a species, especially habitat for reproduction (Rosenberg et al. 1995, 1997). Wildlife corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from areas with high population density; and facilitate the gene flow between populations. Wildlife corridors are

considered sensitive areas by resource and conservation agencies. Terrestrial wildlife species tend to travel along natural water features or stretches of land that simultaneously provide a foraging source and protective cover from predators. Terrestrial and riparian habitat connectivity in the Permit Area has been mapped by Spencer et al. (2010), where larger areas of natural upland and aquatic habitats are likely important for wildlife movement. These areas represent larger blocks of natural, undeveloped land and include generally rugged terrain comprised of shrubland, grassland, woodland, and wetland/riparian habitat types. Due to the overall extent of gas and electric facilities in the Permit Area, a variety of natural terrestrial habitats and water features, such as stream channels and rivers, are crossed by both overhead facilities (e.g., electric transmission or distribution lines) and/or underground facilities (e.g., gas pipelines and/or power lines). These facilities do not create an impassable barrier to terrestrial or aquatic species migration and are generally concentrated in urban/developed portions of the Permit Area.

Although not specifically defined, travel corridors are presumed for Bay checkerspot butterfly. Bay checkerspot butterfly adults are believed to migrate between important habitat locations within and between the west and south Bay Area (*Federal Register* Vol. 73, No. 166, 50406-50452). PG&E facilities are present in and between these areas.

The study area is also located within the Pacific Flyway, which is one of the six major north-to-south migration routes for waterfowl in the U.S., Mexico, and Canada. The Pacific Flyway links breeding grounds in the north to more southerly wintering areas and is therefore utilized by bird species during migration. The multiple waterbodies within the area provide rest and forage areas for many birds during their migratory seasons. Terrestrial wildlife species tend to travel along natural water features that provide a foraging resource and protective cover from predators.

Some limited portions of the Permit Area may be used by Monarch butterflies as they aggregate for overwintering during September–March in a variety of trees (often Monterey pine, Monterey cypress, or eucalyptus) along the Pacific Coast. These overwintering sites are typically within approximately 1.5 miles of the Pacific Ocean or San Francisco Bay (Pelton et al. 2016). Two high-priority overwintering sites are located in the Permit Area and include San Leandro Golf Course and Ardenwood Historic Farm, both in Alameda County. Other important sites include: Stinson Beach, Purple Gate/Bolinas, Fort Baker/Golden Gate National Recreation Area (Marin County); Albany Hill (Alameda County); and Bodega Dunes Campground (Sonoma County) (Pelton et al. 2016).

Known and potential nursery sites/rookeries are also present for a variety of shorebirds, waterfowl, and marine mammal species. Bird rookeries include salt marsh and lagoon habitats such as Bolinas Lagoon, Palo Alto Marsh Baylands Preserve, Don Edwards San Francisco Bay National Wildlife Refuge, Bothin Marsh Preserve, San Pablo Bay National Wildlife Refuge, and Grizzly Island Wildlife Area. In addition, portions of downtown Oakland serve as the largest black-crowned night-heron (*Nycticorax nycticorax*) rookery in the Permit Area. For marine mammals, the largest concentration of harbor seals (*Phoca vitulina*) in California is known in the coastal zone from San Francisco Bay to Point Reyes National Seashore, where pupping occurs March–June. Northern elephant seals (*Mirounga angustirostris*) breed and pup in portions of the same area December–March.

Wetlands and ~~Jurisdictional~~ Waterbodies

- As described in Section 3.10, *Hydrology and Water Quality*, surface waters in the study area drain approximately 7,099 square miles of land in the Bay Area, which comprises the San Francisco Bay Basin. The San Francisco Bay is divided in to four subregions: Suisun Bay, North

Bay/San Pablo Bay, Central Bay, and South Bay, where surface waters include freshwater rivers, streams, lakes, estuarine waters, and coastal waters. Estuarine waters include the San Francisco Bay Delta from the Golden Gate to the Sacramento and San Joaquin Rivers, and the lower reaches of various streams that flow directly into the bay, such as the Napa and Petaluma Rivers in the North Bay and Coyote and San Francisquito Creeks in the South Bay. While not every ~~jurisdictional water stream, lake, or pond~~ in the Permit Area is named or included, a list of major rivers and streams, identified from the National Hydrography Dataset and ~~understood to be~~ under state and/or federal jurisdiction (along with all of their associated tributaries), are listed below by county. These and other wetlands or ~~jurisdictional~~ waters may be in proximity to utility facilities or be intersected (i.e., crossed, either overhead or underground) by such facilities at one or more locations.

- Alameda County: Alameda Creek, San Leandro Creek, San Lorenzo Creek.
- Contra Costa County: San Pablo Creek.
- Marin County: Corte Madera Creek, Lagunitas Creek, Gallinas Creek, Miller Creek, Novato Creek.
- Napa County: Huichica Creek, Napa River.
- San Francisco City and County: None.
- San Mateo County: Cordilleras Creek, San Mateo Creek, Sanchez Creek.
- Santa Clara County: Adobe Creek, Coyote Creek, Guadalupe River, Llagas Creek (drains to the Pacific Ocean via the Pajaro River), Los Gatos Creek, Permanente Creek, San Francisquito Creek, Steven's Creek.
- Solano County: Green Valley Creek, Napa River, Putah Creek, Suisun Creek.
- Sonoma County: Petaluma River, Russian River, Santa Rosa Creek, Sonoma Creek.

3.4.2 Environmental Impacts

3.4.2.1 Methods for Analysis

Habitat in the Permit Area was quantified using a predictive model to help determine the extent of covered species' habitat and to quantify potential impacts as a result of covered activities (Pacific Gas and Electric Company 2017a). Using available geographic information system (GIS) data, Hot Zone¹ and other sensitive habitat layers were created to identify potential or known occupied covered species habitat. Focused desktop analysis and field surveys were performed for some plant species over limited portions of the Permit Area to confirm presence of favorable habitat conditions (ICF 2016). The likelihood that covered activities would affect covered species' habitat was used to

¹ Hot zone is a term defined in PG&E's Bay Area HCP as an area containing a known localized population of HCP-covered wildlife species with a small and well-defined range and where species would be most likely to be affected should covered activities be implemented there. In addition to multiple species covered by the HCP, hot zones were created for California freshwater shrimp and California tiger salamander (in the Santa Rosa Plain, a portion of Solano County, and Palo Alto)—two of the three species to be covered by the ITP. These Hot Zones are mapped and incorporated into PG&E's GIS system for identification of such habitats and prescription of conservation measures.

determine the need for incidental take authorization and development of impact avoidance and minimization measures (AMMs).

*Temporary impacts*² refer to ground and/or vegetation disturbance resulting in effects lasting 12 months or less.³ Temporary impacts result from vegetation clearing, soil excavation, soil stockpiling, repair work to the ROW and existing access roads, and work at staging/laydown areas. Some of the largest temporary impacts resulting from O&M and minor new construction activities would be related to the electric transmission infrastructure—mainly, reconductoring. These activities, although infrequent, are larger and include establishment of work sites for pulling, tensioning, and related equipment for replacing conductors and/or strengthening towers. Other O&M activities are carried out more frequently, but with smaller amounts of anticipated temporary disturbance.

*Permanent impacts*⁴ refer to ground and/or vegetation disturbance that results in effects lasting 12 months or more⁵ and includes impacts that result in the conversion of habitat to a facility footprint. O&M and minor new construction activities that may result in permanent impacts include the expansion of existing substation or pressure limiting station facilities as well as installation of new (rather than replacement of existing) fencing, erosion control measures, gas pipeline valves and equipment, electric transmission and distribution poles or towers, and ROW management. However, the specific locations of required permanent facility installations or expansion (related to either O&M or minor new construction) are generally unknown until local industrial or residential capacity or service obligations are identified. Potential impacts of all covered activities identified in Chapter 2 are assumed to be uniformly distributed across urban, agricultural, and natural land cover types. Because PG&E has been conducting O&M activities in the study area for more than 30 years, ~~the O&M impacts described in this section represent baseline environmental conditions that would not change following the approval of the ITP.~~ Ongoing O&M impacts are considered part of baseline environmental conditions. Other covered activities, which may not have been subject to such ongoing activities, include minor new construction within or immediately adjacent to existing ROWs or next to existing facilities, habitat management, monitoring, and enhancement at mitigation sites for the benefit of the ITP-covered species.

PG&E would implement the AMMs, best management practices, and other measures listed below to avoid and minimize impacts on special-status species, sensitive natural communities, and jurisdictional water features.

PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures

In addition to the BMPs for vegetation management activities (Table 2-3), PG&E would apply the following AMMs listed in PG&E's Bay Area O&M HCP:

² These are also referred to as short-term impacts or disturbance.

³ This definition is consistent with the definition of short-term impacts in the Bay Area O&M HCP.

⁴ These are also referred to as long-term impacts or disturbance.

⁵ This definition is consistent with the definition of long-term impacts in the Bay Area O&M HCP.

PG&E Field Protocols

- Field Protocol (FP)-01: Hold annual training on habitat conservation plan requirements for employees and contractors performing covered activities in the Permit] Area that are applicable to their job duties and work.
- FP-02: Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
- FP-03: Use existing access and ROW roads. Minimize the development of new access and ROW roads, including clearing and blading for temporary vehicle access in areas of natural vegetation.
- FP-04: Locate off-road access routes and work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).
- FP-05: Notify conservation land owner at least 2 business days prior to conducting covered activities on protected lands (state and federally owned wildlife areas, ecological reserves, or conservation areas); more notice will be provided if possible or if required by other permits. If the work is an emergency, as defined in Permittee's Utility Procedure ENV-8003P-01, PG&E will notify the conservation land owner within 48 hours after initiating emergency work. While this notification is intended only to inform the conservation land owner, PG&E will attempt to work with the conservation land owner to address landowner concerns.
- FP-06: Minimize potential for covered species to seek refuge or shelter in pipes and culverts. Inspect pipes and culverts, of diameter wide enough to be entered by a covered species that could inhabit the area where pipes are stored, for wildlife species prior to moving pipes and culverts. Immediately contact a qualified biologist if a covered species is suspected or discovered.
- FP-07: Vehicle speeds on unpaved roads will not exceed 15 miles per hour (mph).
- FP-08: Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.
- FP-09: During fire season in designated State Responsibility Areas, equip all motorized equipment with federally approved or state-approved spark arrestors. Use a backpack pump filled with water and a shovel and fire-resistant mats and/or windscreens when welding. During fire "red flag" conditions as determined by the California Department of Forestry and Fire Protection, curtail welding. Each fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C. Clear parking and storage areas of all flammable materials.
- FP-10: Minimize the activity footprint and minimize the amount of time spent at a work location to reduce the potential for take of species. (See APM BIO-1 through AMP BIO-9 below).
- FP-11: Utilize standard erosion and sediment control best management practices (BMPs; pursuant to the most current version of Permittee's Stormwater Field Manual for Construction Best Management Practices) to prevent construction site runoff into waterways.
- FP-12: Stockpile soil within established work area boundaries and locate stockpiles so as not to enter waterbodies, stormwater inlets, other standing bodies of water. Cover stockpiled soil prior to precipitation events.
- FP-13: Fit open trenches or steep-walled holes with escape ramps of plywood boards or sloped earthen ramps at each end if left open overnight. Field crews will search open trenches or steep-

walled holes the following morning prior to initiating daily activities to ensure wildlife are not trapped. If any wildlife are found, a biologist will be notified and will relocate the species to adjacent habitat or the species will be allowed to naturally disperse, as determined by a biologist.

- FP-14: If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial “weed free” seed mix. (California annual grassland species will be used.)
- FP-15: Prohibit vehicular and equipment refueling 250 feet from the edge of vernal pools, and 100 feet from the edge of other wetlands, streams, or waterways. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. Maintain spill prevention and cleanup equipment in refueling areas.
- FP-16: Maintain a buffer of 250 feet from the edge of vernal pools and 50 feet from the edge of wetlands, ponds, or riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the land planner, biologist, or HCP administrator to minimize impacts by flagging access, requiring foot access, restricting work until dry season, or requiring a biological monitor during the activity.
- FP-17: Directionally fell trees away from an exclusion zone, if an exclusion zone has been defined. If this is not possible, remove the tree in sections. Avoid damage to adjacent trees to the extent possible. Avoid removal of snags and conifers with basal hollows, crown deformities, and/or limbs over 6 inches in diameter.
- FP-18: Nests with eggs and/or chicks will be avoided; contact a biologist, land planner, or the Avian Protection Program manager for further guidance.

Hot Zone HCP Avoidance and Minimization Measures⁶

- Hot Zone-1: Work will avoid pools and streams. Field crew will prevent any damage to the bank and streamside vegetation during placement or movement of materials on the stream banks. Streamside vegetation overhanging into pools or runs will, to the maximum extent practical, not be removed, trimmed, or otherwise modified. (For California freshwater shrimp.)
- Hot Zone-2: Ground-disturbing activities will not occur from the first significant rain (1 inch) during the wet season, October 15–April 15, within 250 feet of the edge of vernal pools unless the field crews conduct the work from an established roadway. Rock outcrops will be accessed only on foot during all times of year. Ground-disturbing activities may occur during this period if a biologist implements measures to avoid the habitat and if the impacts and mitigation are consistent with the HCP. Measures could include directing crews on access, use of erosion/sediment fencing, use of access mats, and other techniques to avoid direct or indirect

⁶ Hot Zones are defined as areas containing a known localized population of covered species with a small and well-defined range, and where species would most likely be affected should covered activities occur there. Hot zone measures apply to areas specifically mapped as hot zones within modeled habitat as illustrated in PG&E's Bay Area O&M HCP. These measures will be implemented consistent with PG&E's Bay Area O&M HCP.

effects. PG&E may seek guidance from USFWS as to the suitability of additional measures to avoid or minimize take of this species. (Longhorn fairy shrimp.)

- Hot Zone-3: A biologist will survey for host and nectar plants (lupine, thistles, viola) prior to activity commencement and will flag off-road access for vehicles, or will identify if foot access or ATVs are necessary. In cases where plants cannot be avoided, activities will only be allowed during flight period, March 1–July 15, to reduce the risk of butterfly mortality. PG&E will avoid and minimize the introduction or spread of noxious weeds from vehicular traffic by educating employees, minimizing off-road travel, and inspecting vehicles to be sure they are not transporting observable noxious weeds. (For San Bruno elfin butterfly, Callippe silverspot butterfly, and Mission blue butterfly [San Bruno Mountain].)
- Hot Zone-4: A biologist will survey for host and nectar plants (nakedstem buckwheat) prior to activity commencement and will flag off-road access for vehicles, or will identify if foot access or ATVs are necessary. In cases where plants cannot be avoided, activities will only be allowed during flight period, August 1–September 30, to reduce the risk of butterfly mortality. USFWS refuge biologist will be contacted if work is to occur on USFWS-owned refuge lands, and PG&E will adhere to USFWS guidance on methods to avoid and minimize effects. (Lange’s metalmark butterfly [Antioch Dunes National Wildlife Refuge].)
- Hot Zone-5: A biologist will survey for host and nectar plants (dwarf plantain, purple owl’s clover, or paintbrush) prior to activity commencement and will flag off-road access for vehicles, or will identify if foot access or ATVs are necessary. In cases where plants cannot be avoided, activities will be allowed during flight period, March 1–April 30. PG&E will avoid and minimize the introduction or spread of noxious weeds from vehicular traffic by educating employees, minimizing off-road travel, and inspecting vehicles to be sure they are not transporting observable noxious weeds. (Bay checkerspot butterfly [Mapped serpentine grassland in Santa Clara County].)
- Hot Zone-6: Limit activities to foot access only when working off of established roadways unless a biological monitor flags off-road access routes for equipment that minimize impacts on habitat and species. This includes the identification and avoidance of vernal pools and stock ponds. Covered activities that cannot avoid vernal pool impacts will be completed when pools are clearly dry. (For California tiger salamander [both Central California and Sonoma County DPSs] specific to Jepson Prairie, Stanford, and the Santa Rosa Plain).
- Hot Zone-7: Activities that result in ground disturbance will occur May 1–October 30 (active season). Vegetation will be cut using hand tools to 3 inches in height. Once the ground is visible, a visual survey for San Francisco garter snake will be conducted by the biologist prior to additional ground disturbance. Field crews will install solid exclusion fencing if the work is in areas of known species presence. If work needs to occur during the inactive period (November 1–April 30) and is located in an area of known occupancy, any burrows will be flagged and avoided by at least 10 feet wherever possible. If any burrows cannot be avoided by this distance, a biologist will inspect following activities to determine whether or not the burrow has been collapsed. If a burrow is collapsed, the biologist shall make efforts to open the burrow. (San Francisco garter snake.)
- Hot Zone-8: For activities that will result in ground disturbance in tidal marsh or coastal wetland habitat, including the removal of marsh vegetation, a biologist will flag access routes for crews when working in habitats dominated by pickleweed (Salicornia) or smooth cordgrass (Spartina alterniflora) in order to minimize impacts on these species. Crews will hand-carry

equipment and use protection mats (landing pads, pallets) to minimize ground disturbance when working within pickleweed or smooth cordgrass. Small areas of healthy vegetation will be cleared by hand prior to placement of protective mats. To avoid take of salt marsh harvest mouse, the biologist will assess the site to determine if: vegetation protection mats are appropriate, use of helicopters is needed, vegetation removal by hand is needed, and an onsite biological monitor is needed. Prior to placement of mats or removal of vegetation, the vegetation will be disturbed (i.e., flushed) to force movement of salt marsh harvest mouse into adjacent tidal marsh areas. Immediately following flushing, the field crew will place a mat or manually remove vegetation with nonmotorized tools (e.g., hoe, rake, trowel, or shovel) to the bare ground. Work will be conducted within 700 feet of wetlands suitable for the Ridgway's rail September 1–January 15. (Ridgway's rail, salt marsh harvest mouse [Marsh/Bay Fringe].)

Species-Specific HCP Avoidance and Minimization Measures

The following three AMMs would apply to activities G9–11 (pipeline lowering, pipeline coating, and pipeline replacement), G14 (PLS)–15, E9 (reconductoring), and ~~E12~~E14–E15 (pole and tower line construction and substation expansion and underground lines).

- Wetland-1: Identify vernal pools and establish buffers. Maintain a buffer of 250 feet around vernal pools and vernal pool complexes. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the biologist or HCP administrator to minimize impacts. These measures include flagging access, requiring foot access, restricting work until the dry season, requiring a biological monitor during the activity, or excavating burrows in ROWs where trenching will occur. Activities must maintain the downstream hydrology to the vernal pool or complex. Additional minimization measures may be implemented with prior concurrence from USFWS.
- Wetland-2: Identify wetlands, ponds, and riparian areas and establish buffers. Maintain a buffer of 50 feet around wetlands, ponds, and riparian areas when feasible. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the biologist or HCP administrator to minimize impacts. These measures include flagging access, requiring foot access, restricting work until the dry season, requiring a biological monitor during the activity, or excavating burrows in ROWs where trenching will occur. Activities must maintain the downstream hydrology to the wetland, pond, or riparian area. Additional minimization measures may be implemented with prior concurrence from USFWS.
- SJKF-1: A biologist will inspect the work site no more than 30 days prior to construction to determine if potential San Joaquin kit fox dens are present. If potential dens are located within the proposed construction footprint and cannot be avoided during construction, a biologist will determine if the dens are occupied. All potential dens within the construction footprint will be dusted with appropriate tracking substrate or monitored with a motion-sensor camera for a minimum of 3 days to determine occupancy unless scat, discarded bones, and tracks are observed and then the den is presumed occupied. Exit ramps will also be installed in these areas at both ends of the excavated areas. If potential San Joaquin kit fox dens are present within the construction footprint or within 200 feet of the construction boundary, disturbance and destruction will be avoided where possible. If the potential dens are determined to be unoccupied and cannot be avoided, no further action is needed. If an occupied or natal/pupping den is discovered within the construction area or within 200 feet of the project boundary,

USFWS shall be immediately notified to discuss protective measures; if USFWS staff are unable to be reached, PG&E will set up exclusion zones, visual screens, and construction monitors to ensure direct mortality is avoided. Under no circumstances will the den be disturbed or destroyed.

In addition to the above, there are 62 PG&E Vegetation Management Best Management Practices (BMPs) listed in Table 2-3 of this EIR, which would be implemented. Please see Table 2-3 for the full list of BMPs; however, the following BMPs are specified in the impact discussions, below.

- BMP 14: Elderberry longhorn beetle habitat: When routine vegetation management activities are conducted in an area of potential valley elderberry longhorn beetle habitat, a qualified individual will survey for the presence of elderberry plants within a minimum of 20 feet from the work site within the utility easement, ROW, franchise, or license, and shall note in vegetation management work request documents to avoid or minimize potential impacts on elderberry plants. Qualified individuals are typically PG&E or contractor arborists or biologists who have undergone specific training to address their work needs through the identification of habitat (i.e., elderberry shrubs). In the range of valley elderberry longhorn beetle, elderberry shrubs with stems greater than 1 inch will be flagged for avoidance if work must occur within 20 feet of a shrub; when a shrub cannot be avoided (e.g., it must be pruned away from power lines or removed), the shrub will be treated and the impact will be reported to the USFWS in an annual report and mitigated per the terms and conditions of the federal Biological Opinion or subsequent authorization. If elderberry plants have one or more stems 1 inch or more in diameter at ground level, additional measures identified in the Valley Elderberry Longhorn Beetle Conservation Plan shall be implemented. Otherwise, no additional minimization, avoidance, or protective measures are required.
- BMP 15: Northern spotted owl (FP-18): When vegetation management staff is aware of known active northern spotted owl nests through either the CNDDDB viewer or property owner information, PG&E will implement the following. If the work is within 0.25 mile of a known active nest(s), the work will be performed either during a limited operating period of August 1 to January 31, or, if the work falls within the breeding period and is within 300 feet of the nest, the PG&E Avian Protection Program manager will be contacted for guidance and work will be performed as directed by the Avian Protection Program manager. If the work is scheduled during breeding season and if the work is 300 feet to 1/4-mile from the nest, work will be performed using hand tools (not chainsaws) or hydraulic pruners if the work is accessible from a regularly trafficked roadway. If the work cannot be performed with hand tools or hydraulic tools, then vegetation management staff will contact the Bird Program manager for guidance. In locations where known active nests occur, vegetation management staff will increase pruning distances from the conductors or pursue tree/brush removals in order to minimize the number of return visits to the area.
- BMP 31: Herbicides use (Plant-01): All herbicide applications performed by vegetation management contractors shall be made in compliance with label requirements as well as all appropriate federal, state, and local laws, rules, and regulations. Note: Use of herbicides and pesticides is not covered activities under the HCP.
- BMP 32: Herbicides type: Only herbicides registered by the federal Environmental Protection Agency and California Environmental Protection Agency shall be applied.

- BMP 33: County Agricultural Commissioner information: During the performance of Vegetation Management ROW Enhancement Operations, operator ID numbers and Site ID numbers shall be obtained for each facility as required by the County Agricultural Commissioner.
- BMP 34: Pest Control Recommendations: Each application shall be covered by a written *Pest Control Recommendation*.
- BMP 35: Pest Control Advisor oversight: A Licensed Pest Control Advisor shall oversee all herbicide and tree growth regulator applications. A qualified applicator shall supervise contractors making herbicide and tree growth regulator applications for vegetation management.
- BMP 36: County Agricultural Commissioner inspection: County Agricultural Commissioners shall be invited to inspect the applicator and application operations when appropriate.
- BMP 37: Herbicide use reporting: The Pest Control Business License holder (applicator) shall report herbicide use monthly to the County Agricultural Commissioner.
- BMP 38: Annual worker safety training (clearing and herbicides): Contractor shall conduct annual worker safety training sessions for all contractor employees involved in the herbicide applications and manual/mechanical clearing. As requested, documentation of this training shall be on file with the PG&E representative who administers their contract.
- BMP 39: Selective application of herbicides (Plant-01): Selective application techniques should be used for Vegetation Management ROW Enhancement Operations wherever practical so that desirable vegetation is not adversely affected.
- BMP 40: Herbicide buffer widths: Buffer widths shall apply pursuant to Vegetation Management Herbicide Buffer Widths to Protect Non-Target Organisms as identified on product packaging.
- BMP 41: Use in watercourse protection zones: Mixing and loading of herbicides is prohibited in watercourse protection zones (see BMPs 60 and 61 for watercourse protection zones).
- BMP 42: Spill protection and cleanup: Applicator shall have a spill prevention and cleanup kit in their vehicle and at the job site.
- BMP 43: Backpack or light-capacity power equipment: Backpack equipment or light-capacity power equipment shall be used for all directed foliar applications.
- BMP 44: Disposal of empty herbicide containers: Empty herbicide containers shall be taken offsite, triple rinsed, and disposed of in a proper manner.
- BMP 45: Minimum operating pressures: Minimum operating pressures shall be used. Nozzle tips that produce a coarser droplet should be used to minimize drift.
- BMP 46: Transport of pesticides: Pesticides shall not be transported in the same compartment with persons, food, or feed. Pesticide containers shall be secured to the vehicle during transportation in a manner that shall prevent spillage into or off the vehicle.
- BMP 47: Contractor written training program: The contractor shall have a written training program for employees who handle pesticides. The written program must describe the materials and the information that shall be provided and used to train the employees.

- BMP 48: Contractor employee training: Training must be completed before an employee is allowed to handle any pesticide and continually updated to cover any new pesticides that shall be handled. Training must be repeated at least annually thereafter.
- BMP 49: Inclement weather precautions: These special precautions shall be observed during periods of inclement weather:
 - Applications shall not be made in, immediately prior to, or immediately following rain when runoff could be expected.
 - Applications shall not be made when wind and/or fog conditions have the potential to cause drift.
 - Basal bark applications shall not be made when stems are wet with rain, snow, or ice.

In addition to the above ~~BMPs and AMMs from PG&E's Bay Area O&M HCP~~, PG&E would also implement the following applicant proposed measures (APMs) to reduce impacts on biological resources associated with O&M and minor new construction activities.

APM BIO-1: Prevent or minimize spread of invasive weeds

The following ~~would~~will be implemented on E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction to prevent the spread of invasive weeds during all phases of covered activities, as appropriate:

- During covered activities involving ground disturbance, mud and/or accumulated soils ~~would~~will be removed from equipment and vehicles, to the extent feasible. Vehicles and equipment ~~would~~will be cleaned or washed before entering a new work site. A log will be kept for each job site and would be completed to document each cleaning or washing of vehicles or equipment before entering each new work site.
- Vehicles ~~would~~will be staged and stored on paved or cleared areas whenever ~~possible~~feasible.
- Certified weed-free mulch, straw, hay bales, or equivalent materials ~~would~~will be used where necessary for covered activities.

APM BIO-2: ~~Protect covered wildlife encountered while performing covered activities~~ Protect special-status wildlife encountered while performing covered activities and report covered wildlife observations

Any special-status wildlife species encountered during the course of a covered activity will be allowed to leave the area unharmed, and work activities that could disturb or harm the individual will halt until the wildlife has left the area. Encounters with a special-status species will be reported to a qualified biologist and PG&E environmental staff.

PG&E will maintain records of all covered wildlife species encountered during permitted activities. Encounters with covered wildlife species will be documented and provided to CDFW in an annual report as required by the ITP. If a covered wildlife species is encountered during the course of operations, the following information will be reported for each species:

- The locations (i.e., narrative, vegetation type, and maps) and dates of observations, including occurrences observed during any required surveys.

- The general condition of individual health (e.g., apparent injuries).
- If the species is moved, the location where the species was captured and the location where it was released.
- The locations, dates, and species and behaviors observed during covered wildlife monitoring.

When conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction PG&E will document encounters with special status species to the same level of detail as required for covered species. During PG&E's environmental screening process, PG&E will also apply this measure to other covered activities to protect special status species and habitats based on recommendations from qualified biologists. This data will be provided in ITP annual reports.

~~Any covered wildlife species encountered during the course of a covered activity would be allowed to leave the area unharmed or, if conditions warrant, moved out of immediate danger. Encounters with a special status species would be reported to PG&E Environmental staff. PG&E would maintain records of all covered wildlife species encountered during permitted activities. Encounters with covered wildlife species would be documented and provided to CDFW in an annual report. If a covered wildlife species is encountered during the course of operations, the following information would be reported for each species:~~

- ~~The locations (i.e., narrative, vegetation type, and maps) and dates of observations.~~
- ~~The general condition of individual health (e.g., apparent injuries).~~
- ~~If the species is moved, the location where the species was captured and the location where it was released.~~

APM BIO-3: Design and site minor new construction projects activities to avoid sensitive areas

New, permanent facilities as part of minor new construction activities ~~would~~ will be sited and designed to avoid impacts on sensitive vegetation types, sensitive natural communities, and unique plant assemblages, as well as occupied habitat and suitable habitat for special-status species, to the extent feasible. If impacts on these areas cannot be avoided, PG&E will determine if additional permitting is required to conduct the work and obtain the required permits (e.g., LSAA). If impacts are expected on covered species' habitat, Mitigation Measure BIO-1 (MM BIO-1) will be implemented to mitigate for habitat impacts.

Where minor new construction would result in impacts on sensitive vegetation types, sensitive natural communities, or unique plant assemblages, PG&E will minimize the construction footprint and implement appropriate protective measures as recommended by the qualified biologist to protect the natural community. Examples of such measures include: reseeding with a California annual seed mix, installing protective fencing around sensitive natural communities or resources, and installing wattles, erosion blankets and other drainage controls to protect new or adjacent plantings.

APM BIO-3a: Minimize spread of invasive plant and plant pathogens in minor new construction

When conducting minor new construction activities, PG&E will avoid or minimize the spread of invasive species by taking the following actions:

1. Prior to commencement of activities located on or adjacent to non-paved surfaces, a qualified biologist will flag known populations of noxious weeds and invasive plants in the work areas. Invasive plant species include those listed as invasive by the California Invasive Plant Council (Cal IPC).
2. PG&E will stage work in areas not infested with weeds or treat for weed removal prior to using an infested area.
3. Prior to ground disturbance in areas containing species susceptible to Sudden Oak Death, a qualified professional (e.g., biologist, arborist, botanist familiar with Sudden Oak Death and the vegetation communities in the area) will assess the risk of activities and will identify and implement measures to reduce or avoid the risk of Sudden Oak Death spread. These measures will include but will not be limited to the following, and will be further developed and updated based on the best available science and site-specific conditions:
 - a. Designate quarantine areas and implement proper measures for disposal of infested materials (e.g., branches, split wood, wood chips).
 - b. Sanitize shoes, pruning gear, and other equipment with sanitizing materials (e.g., chlorine bleach, Clorox Clean-up, Lysol, scrub brush, boot brush) before and after ground-disturbing and vegetation removal activities are implemented.
4. Clothing, footwear, and equipment used during minor new construction will be cleaned of soil, seeds, vegetation, or other debris or seed-bearing material before entering a work site or when leaving an area with infestations of invasive plants and noxious weeds.
5. Heavy equipment and other machinery used in areas with infestations of invasive plant species or Sudden Oak Death will be inspected for the presence of invasive species before use on the project site and will be cleaned before entering the site, to reduce the risk of introducing invasive plant species or plant pathogens.
6. To minimize the introduction and spread of noxious weeds and invasive plants, PG&E will avoid moving weed-infested gravel, rock, and other fill materials to relatively weed-free locations. In areas where invasive plants are removed during minor new construction or vegetation removal activities, PG&E will dispose of invasive plant biomass off site at an appropriate waste collection facility or treat biomass on site to eliminate seeds and propagules and prevent reestablishment; if moved off site, PG&E will transport invasive plant material in a closed container or bag to prevent the spread of propagules during transport. PG&E will use certified weed-free straw and mulch for erosion-control projects. PG&E will maintain stockpiled, uninfested material in a weed-free condition.
7. Areas where ground disturbance has resulted in exposed soil as a result of minor new construction shall be seeded with compatible California annual species, as determined by a qualified biologist or botanist familiar with the native vegetation in the area and experienced in revegetation techniques. Revegetation will occur prior to the onset of winter rains within the year initial impacts take place. If work cannot feasibly be scheduled outside

- the rainy season, revegetation may occur as directed by the qualified biologist and no later than the onset of the next winter rains.
8. To ensure a successful revegetation effort, onsite vegetation shall meet the following success criteria:
- a. PG&E shall perform pre-activity surveys to record baseline vegetative ground cover conditions and composition by a qualified biologist prior to covered activities as follows. The biologist will record the following:
 - i. Absolute percent ground cover for the entire work area.
 - ii. Relative percentages of ground cover within the work area by herbaceous plants, shrubs, trees, and noxious/invasive plants.
 - iii. Develop a catalog of all invasive species present within the work area, including an estimate of percent composition by species.
 - b. PG&E will conduct post-activity monitoring of work areas in the spring following completion of minor new construction.
 - i. A qualified biologist will record any new invasive species that may have inadvertently been introduced to the work area. The biologist shall make special note of any new invasive plant species rated as "high" by the Cal IPC.
 - ii. A qualified biologist will record whether there was an increase in relative cover of invasive species from baseline that may have resulted from the covered activity.
 - iii. If relative cover of invasive plant species has increased within the work area, PG&E shall remove and/or dispose of invasive plants in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor. If any new invasive plants rated by Cal IPC as "high" are found within the work area, they will be removed in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor.
 - iv. If the relative ground cover of invasive plants exceeds baseline by 100 percent or more, PG&E will reseed the areas where invasive plants are removed and monitor for one additional year.

APM BIO-4: Avoid special-status plants

Occurrences of special-status plant species will be avoided to the extent practicable and will include performance of project activities in special-status plant habitat after senescence. PG&E has created "Map Book zones" for the 13 state or federally listed plants that are covered in the O&M HCP. A Map Book zone is defined as an area of occupied or potentially occupied the HCP-covered plant species habitat as determined by PG&E botanical surveys. When rare and endangered plant species subject to the NPPA cannot be avoided, PG&E will follow the requirements of California Fish and Game Code Sections 1913(b) and 1913(c) concerning notification to CDFW at least 10 days in advance and provide an opportunity to salvage such species.

If a special-status plant is found or known to occur, the plant will be avoided if feasible (i.e., O&M objectives could still be met). If feasible to avoid, avoidance will include establishing a buffer around the plants and demarcation of the buffer by a qualified biologist or botanist using flagging. Consideration of site-specific environmental factors such as terrain, site hydrology, light, and potential introduction of invasive plants may inform the avoidance approach.

~~Occurrences of special-status plant species would be avoided to the extent practicable and would include performance of project activities in special-status plant habitat after senescence. When special-status plant species cannot be avoided, PG&E will follow the requirements of California Fish and Game Code Sections 1913(b) and 1913(c) concerning notification; whereby PG&E will notify CDFW to provide an opportunity to salvage such species.~~

APM BIO-5: Erect wildlife flagging or exclusion fencing

Prior to construction or commencement of any activity that, in the absence of fencing, is likely to directly or indirectly adversely affect covered species, flagging or exclusion fencing for the species ~~would~~ will be installed around the perimeter of the activity footprint,⁷ or otherwise to ensure species protection.

Any exemption or modification of flagging or exclusion fencing requirements ~~would~~ will be based on the specifics of the activity, site-specific population, or habitat parameters. Sites with low population density and disturbed, fragmented, or poor habitat ~~would~~ will likely be candidates for flagging or fencing requirement exemptions or modifications. Substitute measures, such as onsite biological monitors in the place of the flagging or fencing requirement, ~~would~~ will be performed as appropriate.

Prior to flagging or fencing, the qualified individual ~~would~~ will ensure (to the extent ~~possible~~ feasible) that covered ~~special-status~~ species are absent from the activity footprint. After an area is flagged or-fenced, PG&E is responsible for ensuring that covered ~~special-status~~ species flagging or fencing is maintained and opened/closed appropriately during project activities and regularly inspected for damage, which ~~would~~ will be repaired as soon as possible.

This measure will also be applied when conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction when these activities are likely to adversely affect special-status species. PG&E may also apply this measure to other covered activities to protect special status species and habitats based on recommendations from qualified biologists.

APM BIO-6: Protect nesting birds

All vegetation clearing and ground-disturbing activities will be conducted outside of the nesting season (generally March 1–August 31) to the extent feasible. If this is not feasible, a biologist or qualified individual will determine if pre-construction activity surveys, nest buffers, and/or monitoring are needed in accordance with PG&E's Nesting Bird Management Plan. Nesting bird surveys will be scheduled to occur within a timeframe prior to construction the activity that is

⁷ An activity footprint is the area of ground disturbance associated with the pre-construction, construction, operation, implementation, maintenance, and decommissioning of an activity, including associated linear and non-linear components (e.g., staging areas, access routes and roads, gen-ties, pipelines, other utility lines, borrow pits, disposal areas). The footprint may also be considered synonymous with the covered activity site.

suitable for the detection of recently established nests. If active nests containing eggs or young are found, the qualified biologist or individual will establish an appropriate nest buffer in accordance with the species-specific buffers in PG&E's Nesting Bird Management Plan. Nest buffers under the Plan will be species-specific and can range from 15 to 100 feet for passerines, 50 to 300 feet for raptors, or larger if necessary, depending on the planned activity's level of disturbance, site conditions, and the observed bird behavior. Covered activities will not commence within the established buffer areas until the qualified biologist or individual determines that the young have fledged or the nest is no longer active. Active nests will be periodically monitored until the young have fledged or the activity all construction is finished. If birds with active nests are observed showing behavioral signs of agitation (e.g., standing up from a brooding position, flying off the nest) during covered activities, the buffer will be increased to a distance in which the behavioral signs of agitation cease, in accordance with PG&E's Nesting Bird Management Plan.

As part of the ITP annual report, PG&E will provide a summary of covered activities where the Nesting Bird Management Plan was implemented; the summary will include the location, dates, species (if known), and nest buffers applied to the covered activity including buffer efficacy.

(The Nesting Bird Management Plan is intended to maintain compliance with federal and state bird protection regulations through a standardized approach to avoiding and minimizing disturbance to nesting birds, including burrowing owl [see APM BIO-6a].)

All vegetation clearing and ground-disturbing activities would be conducted outside of the nesting season (generally March 1 to August 31) to the extent feasible. If this is not feasible, qualified⁸ individual would determine if pre-construction surveys, nest buffers, and/or monitoring are needed. Nesting bird surveys would be scheduled to occur within a timeframe prior to construction that is suitable for the detection of recently established nests. If active nests containing eggs or young are found, the qualified biologist would establish an appropriate nest buffer in accordance with PG&E's Nesting Bird Management Plan. Nest buffers would be species-specific and can range from 15 to 100 feet for passerines and 50 to 300 feet for raptors, depending on the planned activity's level of disturbance, site conditions, and the observed bird behavior. Established buffers would remain until the young have fledged or the nest is no longer active. Active nests would be periodically monitored until the young have fledged or all construction is finished.

APM BIO-6a: Western burrowing owl avoidance

If burrowing owls are observed during any covered activities, a qualified biologist will be contacted immediately. The qualified biologist will determine measures to avoid impacts burrowing owls. For ground disturbing activities greater than 0.1 acre in suitable burrowing owl habitat a qualified biologist will conduct a survey at least 14 days prior and again 24 hours prior to the activity to determine the presence/absence of active burrowing owl nesting or wintering burrows within 250 feet of a work area. If owls or sign are detected and work needs to occur within 250 feet, PG&E will implement measures to avoid nest abandonment such as

⁸ A qualified individual would have experience conducting nesting bird surveys and would be able to accurately identify nesting behavior.

rescheduling the work, screening work areas, minimizing pedestrian access within 250 feet, and evaluating owl's tolerance to disturbance, and report results to CDFW annually.

APM BIO-7: Protect breeding and pupping bats

When feasible, activities directly affecting bat roosting habitat will be conducted outside of the bat breeding/pupping season (generally, April through mid-September). If work that would affect known bat breeding sites must be done in the bat breeding/pupping season, a qualified biologist would evaluate known breeding/roosting sites or conduct surveys for bat roosts in suitable breeding/roosting sites (e.g., bridges, mines, caves, trees with hollows, palm trees, snags, buildings, long and dark culverts, rock outcrops, dense tree canopies, and flaking tree bark). If evidence of a bat maternity roost is found or maternity roosts are detected, PG&E will avoid conducting covered activities that may directly affect the active roost site, including the following:

- If a maternity roost is identified then the qualified bat biologist will develop a Bat Avoidance and Monitoring Plan prior to the start of project activities that shall include: (1) an assessment of all impacts to bats from the activity, including noise disturbance during covered activities and (2) effective avoidance and minimization measures to protect bats in order to ensure that direct impact to active bat maternity roost site do not occur. Notification will be provided to CDFW prior to the start of covered activities. The notification will include a copy of the Bat Avoidance and Monitoring Plan. If direct impacts to identified maternity roost sites cannot be avoided, PG&E will provide a compensatory mitigation plan to CDFW for review and approval.
- As necessary, an exclusionary buffer will be maintained around active roosts. The size of the buffer will be determined by the qualified biologist based on factors such as the planned activity's level of disturbance and site conditions and will typically be 250 feet.
- As necessary, a qualified biologist will monitor active roost site buffers during O&M activities to determine if roosting activity is influenced by noise or vibrations until a qualified biologist has determined if the young bats are volant (i.e., able to fly) or the roost is unoccupied.

When feasible, to protect bats and in accordance with BMP-30, tree work near riparian zones shall be conducted during the dry season (generally May 15–October 15). If it is not feasible to conduct tree work during the dry season, operations will occur between rain events or during dry spells unless there is an emergency or imminent threat to life or property.

When feasible, activities directly affecting bat roosting habitat would be conducted outside of the bat breeding/pupping season (generally, April through mid-September). If work that would affect known bat breeding sites must be done in the bat breeding/pupping season, PG&E would evaluate known or suspected breeding/roosting sites (e.g., bridges, mines, caves, trees with hollows, palm trees, snags, buildings, long and dark culverts, rock outcrops, dense tree canopies, and flaking tree bark). If roosting bats are detected, PG&E would avoid conducting construction activities that may directly affect the active roost site, including the following:

- As necessary, an exclusionary buffer would be maintained around active roosts. The size of the buffer may be modified at the discretion of the qualified biologist based on the species' sensitivity to disturbance from O&M activities and the status of the roost.

- ~~As necessary, a qualified biologist would monitor active roost site buffers during O&M activities to determine if roosting activity is influenced by noise or vibrations until a qualified biologist has determined if the young bats are volant (i.e., able to fly).~~

APM BIO-8: Avoid Alameda whipsnake in core habitat

Prior to the start of construction in core habitat (i.e., areas of concentrated use; habitat in core areas primarily consists of scrub communities such as coastal scrub, coyote brush scrub, mixed chaparral, and chamise chaparral but may also include immediately adjacent grassland), the work area will be visually surveyed for Alameda whipsnakes by a qualified biologist. If a whipsnake is encountered during construction, activities will stop and the qualified biologist will then identify actions sufficient to avoid impacts on the species (e.g., continued work halt, buffer establishment) and the whipsnake will be allowed to leave the area on its own volition. Activities could resume when the qualified biologist determines that activities will not adversely affect the whipsnake or that the whipsnake has moved a sufficient distance from the work area such that activities will not adversely affect the whipsnake.

~~Prior to the start of construction in core habitat, the work area will be surveyed for Alameda whipsnakes by a biologist. If a whipsnake is encountered during construction, activities that present a risk to the snake will stop until the snake has moved out of the construction area.~~

APM BIO-9: San Joaquin kit fox/American badger

When ground disturbance exceeding 0.5 acre is planned within suitable habitat and range of San Joaquin kit fox or American badger, a qualified biologist familiar with these species and experienced in conducting surveys will survey the work area no more than 30 days prior to the covered activity to determine if potential San Joaquin kit fox or American badger dens are present. If potential dens are located within the proposed activity footprint and cannot be avoided during the activity, a biologist will determine if potential dens are occupied. All potential dens within the activity footprint will be dusted with appropriate tracking substrate or monitored with a motion-sensor camera for a minimum of 3 days to determine occupancy, unless scat, discarded bones, and tracks are observed and the den is presumed occupied. If potential dens are determined to be unoccupied and cannot be avoided, no further action is needed. Otherwise, potential dens within the project footprint or within 200 feet will be avoided where possible, or the following steps will be taken. If an occupied or natal/pupping den is discovered within the activity area or within 200 feet of the project boundary, PG&E shall contact CDFW to discuss protective measures and the need for a permit. Under no circumstances will an occupied or natal/pupping den be destroyed. In the suitable habitat and range of San Joaquin kit fox and American badger, exit ramps will be installed at each end of excavated trenches.

MM BIO-1: Acquire, preserve, and/or enhance suitable habitat for mitigation

~~PG&E will acquire, preserve, and/or enhance potential habitat, or purchase bank credits for California freshwater shrimp, California tiger salamander, and Alameda whipsnake to fully mitigate for the potential take of these species. Compensatory mitigation locations will be subject to review and approval of the Department. Habitat mitigation will be provided for covered species based on acreages of estimated and actual habitat losses in consistent with *jump*~~

~~start⁹ and stay ahead¹⁰ mitigation approaches. Mitigation for habitat disturbance from temporary and permanent impacts would be provided at the following ratios:~~

- ~~• 3:1 ratio for permanent impacts on modeled habitat for California freshwater shrimp, California tiger salamander (both Central California and Sonoma County DPS), and Alameda whipsnake (3 acres mitigated for every 1 acre permanently affected).~~
- ~~• 1:1 ratio for temporary impacts on modeled habitat for California freshwater shrimp and modeled upland habitat for California tiger salamander (Sonoma County DPS).~~
- ~~• 1:1 ratio for temporary impacts on modeled breeding habitat for California tiger salamander (both Central California and Sonoma County DPS).~~
- ~~• 0.5:1 ratio for temporary impacts on modeled upland habitat for California tiger salamander (Central California DPS) (0.5 acres mitigated for every 1 acre temporarily affected) when mitigation is provided according to jump start and stay ahead provisions. For the first 5 years, mitigation that is not in place prior to any impacts will be at a 1:1 ratio.~~
- ~~• 0.5:1 ratio for temporary impacts on non-core (movement) habitat for Alameda whipsnake (0.5 acres mitigated for every 1 acre temporarily affected) when mitigation is provided according to jump start and stay ahead provisions. For the first 5 years, mitigation that is not in place prior to any impact will be at a 1:1 ratio.~~
- ~~• 1:1 ratio for temporary impacts on Alameda whipsnake core or perimeter core habitat.~~

~~By March 31 of each year, PG&E would submit an annual report to CDFW summarizing the mitigation ratios and credits that were debited from its mitigation credit portfolio for covered activities during the previous calendar year, as well as detailed information from APM BIO-2.~~

Significance Criteria

In accordance with Appendix G of the State CEQA Guidelines, the potential significance of impacts on biological resources from the proposed project and implementation of covered activities was evaluated for each of the following criteria:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS.
- Have a substantial adverse effect on state or federally protected wetlands as defined by CWA Section 404 (including, but not limited to, marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

⁹ Land acquisition, preservation, and/or habitat enhancement efforts that are made in advance of permit issuance.

¹⁰ PG&E will “stay ahead” of its mitigation obligations by calibrating the mitigation credits that may be necessary for future years based on information from the Annual Report for the prior year.

- 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 HCP, NCCP, or other approved local, regional, or state HCP.

3.4.2.2 Impact Discussion

As described in Chapter 3.0.2, *Baseline for CEQA Analysis*, PG&E's ongoing O&M activities are part of the CEQA environmental baseline. Although CDFW's issuance of the ITP would not change the need or overall extent of the work that will be required within the next 30 years on PG&E's natural gas and electric systems in the Bay Area, it would include requirements for avoiding and minimizing take of three covered species, which may alter the approach for carrying out O&M and minor new construction activities by shifting disturbance area locations, limiting timing, or implementing physical actions to protect the species and their habitat. The direct and indirect impacts of covered O&M and minor new construction activities that could occur as a result of CDFW issuing the ITP are the focus of the following environmental analysis. The potential environmental impacts of the ITP - authorization of incidental take expected to occur with implementation of the covered activities are evaluated in the context of the state and federal regulatory framework within which PG&E operates, PG&E's standard practices, and the implementation of the voluntary applicant avoidance and minimization measures described in Chapter 2, Tables 2-3 and 2-4.

Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS (Less-than-Significant Impact with Mitigation)

The O&M activities required for existing gas and electric transmission and distribution infrastructure have generally been occurring for decades, with the majority of the facilities having been constructed during the 1960s and 1970s. These activities are ongoing and would not change from those currently required for the existing system. Even minor new construction is generally associated with existing infrastructure in urbanized or previously disturbed areas. Most of these activities did not previously require permits. Thus, ~~minimal~~ no additional impacts on candidate, sensitive, or special-status species would result from CDFW's issuance of the ITP.

As explained in the analysis that follows, O&M and minor new construction activities in wetlands and riparian areas that support special-status plant and wildlife species would be avoided without acquisition of appropriate permits from agencies with jurisdiction over specific activities in wetlands and other waters. Although wetlands and riparian areas would be avoided as much as possible, some O&M and minor new construction activities may have temporary or permanent impacts on these habitat types and the species associated with them. This approach is used currently and would not change after issuance of the ITP.

PG&E's conservation strategy for O&M activities depends upon habitat models that have been developed for each species covered by the HCP, which includes the three ITP-covered species. Habitat models have been incorporated into PG&E's environmental review process to streamline the implementation process for covered activities, while at the same time capturing incidental take of HCP- and ITP-covered species that would occur as a result of covered activities. Habitat models were developed utilizing existing commercial data and biological information to assess the likelihood that

a covered species or its habitat is present at a particular location. PG&E worked closely with USFWS and CDFW to develop and refine the habitat models. The type of modeled habitat that would be affected informs PG&E's land planners or biologists on how to prescribe the appropriate AMMs, APMs, FPs, or BMPs. PG&E's biologists and land planners would review the modeled habitat information in the company's GIS system to assess whether a covered activity falls within or close to modeled habitat, identify the modeled habitat that would be affected, and identify the location of Map Book zones and hot zones.

Habitat loss and disturbance resulting from activities less than 0.1 acre that occur in modeled habitat for the three ITP-covered species (as well as the HCP-covered species) would not usually be actively restored in the field; instead, compensatory mitigation would be provided for these activities based upon the pre-determined disturbance estimates. Areas larger than 0.1 acre in grassland habitat for covered species would be revegetated with a commercial California annual grassland seed mix (FP-14). PG&E would periodically evaluate a small subset of these activities to ensure that average on-the-ground effects are not larger than estimated, as well as to ensure that temporary effects are not, in practice, permanent effects. Table 3.4-6 summarizes the estimated acreage of habitat disturbance to each of the covered species. Totals may not sum due to rounding. California tiger salamander habitat in the Sonoma County DPS did not distinguish breeding and upland habitat because the Santa Rosa Plain Conservation Strategy did not differentiate these areas.

Table 3.4-6. Summary of Estimated Acres of Habitat Disturbance to ITP-Covered Species

ITP-Covered Species	Acres of Habitat Disturbance				
	Permanent (Annual)	Temporary (Annual)	Permanent (30 years)	Temporary (30 years)	Total (30 years)
<u>California freshwater shrimp</u>	<u>0.01</u>	<u>0.07</u>	<u>0.3</u>	<u>2</u>	<u>2.3</u>
<u>California tiger salamander (Central CA DPS)</u>					
<u>Potential breeding habitat</u>	<u>0.07</u>	<u>0.8</u>	<u>2</u>	<u>25</u>	<u>27</u>
<u>Potential upland habitat</u>	<u>9.9</u>	<u>126.7</u>	<u>298</u>	<u>3,800</u>	<u>4,098</u>
<u>California tiger salamander (Sonoma County DPS)</u>	<u>0.4</u>	<u>2.7</u>	<u>13</u>	<u>80</u>	<u>93</u>
<u>Alameda whipsnake</u>					
<u>Core</u>	<u>0.68</u>	<u>0.43</u>	<u>34</u>	<u>13</u>	<u>47</u>
<u>Perimeter Core</u>	<u>0.5</u>	<u>2.3</u>	<u>25</u>	<u>70</u>	<u>95</u>
<u>Movement</u>	<u>0.5</u>	<u>11</u>	<u>27</u>	<u>329</u>	<u>356</u>

Source: PG&E's 2081 Application

As required by the ITP, PG&E would provide habitat mitigation through the following mechanisms: purchase of high-quality habitat, purchase or placement of conservation easements, purchase of credits from approved mitigation or conservation banks, partnerships with and/or contributions to existing conservation planning and recovery efforts, placement of conservation easements on existing PG&E lands, implementation of and contributions to recovery plan strategies, and habitat enhancement and restoration on lands already protected.

Temporary effects would be mitigated at a ratio of 0.5:1 or 1:1, depending on the species and timing of the mitigation, and permanent effects would be mitigated at a ratio of 3:1. PG&E would provide

habitat mitigation in advance of impacts on covered species. PG&E would base its mitigation on acreages of estimated and actual habitat losses and would adjust the timing of acquisitions based on forecasted habitat impacts and the amount of mitigation that has previously been implemented. For covered species, particularly broadly distributed species like California tiger salamander, the mitigation would be provided early in the permit term. For other species like California freshwater shrimp, mitigation amounts may be acquired in advance of impacts in 5-year or 10-year increments, depending on the species, the size of the mitigation requirement, the availability of mitigation lands, the potential for covered activities to result in impacts on covered species, and other variables. PG&E proposes to acquire conservation lands during HCP development that would count toward compliance requirements when the ITP is issued. More details about compensatory mitigation specific to the three ITP-covered species are provided in the discussion below.

Plants

Given the geographic extent of the study area, focused special-status plant surveys were not performed except at locations where impacts on ~~threatened or endangered plants listed under NPPA or CESA~~ could result (ICF 2016) from O&M activities. Where field surveys were not performed, available CNDDDB and CNPS *Inventory of Rare and Endangered Plants* (California Native Plant Society 2018) data were utilized in conjunction with GIS and aerial photography to develop a list of special-status plant species that may be present in the study area.

The assembled list of special-status plants includes those plants known or assumed to be present in the study area and is composed of 413 special-status plant species. Of these species, 271 are CRPR List 1 species, 26 are CRPR List 2 species, 1 is a CRPR List 3 species, and 105 are CRPR List 4 species. Using desktop analysis, along with field surveys over a portion of the Permit Area (ICF 2016), 28 species were determined to be present, 207 species were determined to be likely to occur, 134 species were determined to have a potential to occur, and 31 species were determined to be unlikely to occur (ICF 2016). Thirteen of the special-status plant species were determined to be absent due to range restrictions or lack of suitable habitat in the study area.

Under the provisions of California Fish and Game Code Section 1913(b), the incidental removal of plant species listed as endangered or rare plant species under the NPPA is not prohibited within a ROW to allow a public utility to fulfill its obligation to provide service to the public; however, ~~to the extent feasible PG&E will~~would notify CDFW and provide the opportunity to salvage rare plants at least 10 days in advance of covered activities (APM BIO-4). In addition, it is assumed that over decades of performance of these activities, plant populations are generally not in conflict with typical O&M activities or otherwise tolerate regular, periodic impacts of such activities; for example, once facilities and access routes have been installed and utilized, ongoing O&M does not continue to alter habitat. ~~PG&E would continue to follow California Fish and Game Code Section 1913(b) and implement APMs to avoid and minimize O&M and minor new construction activity impacts on special-status plants. PG&E would continue to implement APMs to avoid O&M and minor new construction activity impacts on special-status plants. PG&E would also follow California Fish and Game Code Section 1913(b) to minimize impacts on NPPA-listed rare and endangered plants when impacts are unavoidable.~~ Thus, minimal impacts related to special-status plants would occur. O&M and minor new construction activities that could affect special-status plant species, as well as the measures implemented to avoid and minimize impacts, are described in the following paragraphs. As is current practice, O&M and minor new construction activities in wetlands and riparian areas that support special-status plant species would be avoided without acquisition of appropriate permits from agencies with jurisdiction over specific activities in wetlands and other waters. If such

permits were required and obtained, direct impacts on wetland special-status plant species could occur; however, activities would be subject to additional measures to further avoid and minimize direct impacts on such species.

PG&E's O&M and minor new construction activities result in various levels of surface disturbance, as described in Chapter 2. Grading, excavation, and vehicle and foot traffic associated with O&M and minor new construction activities in the study area have the potential to result in the direct loss of ~~special-status plant species listed as rare or endangered under the NPPA~~. While O&M activities typically occur within existing facility ROWs and existing access roads, minor new construction activities can extend into special-status plant species habitat, away from existing ROWs or facility footprints. Equipment and vehicles may introduce noxious weeds that compete with special-status species or may result in petroleum product or other chemical spills that negatively affect special-status plant species and habitat. In addition, impacts such as increased fugitive dust could reduce the growth and vigor of special-status plant species.

PG&E would incorporate the AMMs from PG&E's Bay Area O&M HCP to avoid and minimize potential impacts on biological resources, including FP-01 through FP-17. Specifically, implementing the worker education program in accordance with FP-01, as well as the providing project-specific direction from the environmental release-to-construction and environmental screening and review process (see Section 2.9, Overview of PG&E's Environmental Review Process), would decrease the likelihood of ~~NPPA rare or endangered special-status~~ plants being inadvertently disturbed during covered activities because personnel would be aware of ~~special-status~~ these plants in relevant portions of the Permit Area. Disturbance would be minimized to the smallest practical area pursuant to FP-02, FP-03, FP-04, and FP-10. As described in FP-14, PG&E would restore habitat where more than 0.10 acre of special-status species (i.e., grassland) habitat may be affected by covered activities. The weed management actions would protect special-status plant species from competition with invasive plant species, as well as decrease alterations of the habitat, which could facilitate the establishment of invasive weeds. With implementation of these measures, project activities would be unlikely to have a substantial adverse effect on special-status plants, and direct and indirect impacts would be less than significant.

PG&E would also implement specific APMs designed to further avoid and minimize impacts on ~~special-status~~ NPPA rare or endangered plants. PG&E would conduct habitat assessments, pursuant to its environmental review process described in Section 2.9, when planned O&M or minor new construction activities would occur in potential habitat. PG&E would take weed management actions during all phases of activities to decrease the potential introduction of invasive weeds in accordance with APM BIO-1 and APM BIO-3a. PG&E would site and design new facilities to avoid impacts on unique plant assemblages, occupied habitat, and suitable habitat for special-status species, in accordance with APM BIO-3. Under APM BIO-4, ~~special-status plant~~ NPPA rare and endangered species would be avoided to the maximum extent practicable. The covered activities described herein are ongoing and not expected to change with issuance of the proposed ITP and not anticipated to result in increased impacts on special-status plant species from the current baseline. Implementation of the aforementioned APMs would further reduce potential direct and indirect impacts on special-status plant species. Therefore, impacts on special-status plant species are considered less than significant and no mitigation is required.

Invertebrates

Vernal Pool Invertebrates

Invertebrates associated with vernal pool habitat in the Permit Area include Delta green ground beetle, conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp. Each of these species has the potential to inhabit vernal pools within the Permit Area. Ground-disturbing activities such as grading or excavating ~~could~~would not result in mortality of vernal pool invertebrates by crushing or burying shrimp cysts or beetle larvae, pupae, and adults because vernal pool habitats would be avoided when conducting covered activities. ~~However, O&M activities or minor new construction are unlikely to result in direct mortality or injury of vernal pool invertebrates because PG&E does not typically conduct work within vernal pools.~~ APM BIO-3 requires that new permanent facilities would be sited to avoid impacts on sensitive areas, such as vernal pools, to the extent feasible, and APM BIO-3a requires minimization of spread of invasive plant and plant pathogens during minor new construction. Wetland-1 and Wetland-2 also require that buffers be established around vernal pool and vernal pool complexes, and wetlands, ponds, and riparian areas, respectively, to minimize indirect effects on these features. Hot Zone-2 would be implemented specifically in areas where longhorn fairy shrimp could occur to avoid and minimize impacts on this species. However, even with these minimization measures, O&M and minor new construction are anticipated to have temporary and permanent effects on vernal pool habitats over the duration of the permit. These effects would occur regardless of CDFW's action to issue an ITP and are subject to the conditions of P&E's O&M HCP and federal permit to minimize adverse impacts vernal pool species.

Ground-disturbing activities ~~could~~would be implemented in a manner to prevent result in habitat loss or alteration by ~~maintaining-changing~~ the topography of vernal pools, ~~degrading-protecting~~ water quality from increased sedimentation or accidental spills, and ~~increased-controlling~~ construction-related dust; and herbicide use (BMPs 31–49). ~~The spread of invasive weeds could be propagated by seeds introduced from other locations via construction equipment or vehicles, which could reduce habitat quality within vernal pools, would be prevented or minimized.~~ APM BIO-3a requires minimization of the spread of invasive plants and pathogens in minor new construction. PG&E will incorporate AMMs from PG&E's Bay Area O&M HCP to avoid and minimize potential impacts on biological resources in vernal pool habitat, specifically FP-01 through FP-05, FP-07, FP-08, FP-10, FP-11, FP-12, and FP-14 through FP-16, as described under *PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures*. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust; FP-08 prohibits dumping of trash at work sites; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance; FP-15 prohibits vehicle and equipment refueling within 250 feet of vernal pools or within a secondary containment area; and FP-16 requires a buffer of 250 feet from the edge of vernal pools, access route identification, foot access, seasonal restriction on activity and/or a biological monitor. Collectively, these measures help reduce potential direct and

indirect impacts on these species. In addition, PG&E would implement the HCP's Hot Zone-6 and Wetland-1, which require identification of vernal pools and maintenance of buffers around vernal pools and vernal pool complexes. Habitat for these species is mapped as sensitive in PG&E's screening system and, as federally listed species, any impacts on these species are addressed under PG&E's existing federal permit. Because these measures will be incorporated into the project and issuance of the ITP is not expected to result in substantially increased impacts from ongoing O&M and minor new construction, potential direct and indirect impacts on vernal pool invertebrates would be less than significant and no mitigation is required.

California Freshwater Shrimp

California freshwater shrimp requires perennial streams with undercut banks, exposed roots, overhanging vegetation, and woody debris that provide refugia from swift currents and cover from predators. O&M activities and minor new construction within occupied stream channels or on channel banks could result in injury or mortality of larvae and adults and the loss or degradation of habitat. Because PG&E does not typically conduct work within the channel of a perennial stream, death or injury from in-channel work is unlikely. However, construction or vegetation management activities on or near stream banks occupied by California freshwater shrimp could collapse overhanging banks if vehicles, equipment, and personnel are working too close to the stream bank; adults and larvae could be killed or injured. Ground-disturbing activities adjacent to streams could result in sediment entering streams occupied by California freshwater shrimp, and leaks or spills from construction equipment and vehicles could accidentally enter occupied streams and affect water quality. Habitat restoration or enhancement activities related to California freshwater shrimp compensatory mitigation under MM BIO-1, while ultimately beneficial to a variety of species, could also result in injury or mortality of California freshwater shrimp individuals.

PG&E, in cooperation with the USFWS and CDFW, modeled habitat for California freshwater shrimp; there are approximately 1,602 acres of modeled habitat distributed across Sonoma County (67%), Marin County (18%), and Napa County (15%) in the Permit Area (Pacific Gas and Electric Company 2017a). Over the 30-year permit term, O&M and minor new construction activities would result in permanent loss of 0.3 acre of California freshwater shrimp habitat and temporary loss of 2.0 acres of habitat. These impacts would be distributed across Marin, Napa, and Sonoma Counties.

California freshwater shrimp habitat is identified and mapped in PG&E's systems as a Hot Zone, which indicates where PG&E would implement PG&E's Bay Area O&M HCP AMMs, including FP-01 through FP-05, FP-07, FP-08, FP-10, FP-11, FP-12, and FP-14 through FP-17, Wetland-02, and Hot Zone-1. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust; FP-08 prohibits dumping of trash at work sites; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance; FP-15 prohibits vehicle and equipment refueling within 100 feet of streams or within a secondary containment area; FP-16 requires a buffer of 50 feet from the edge of riparian areas, access route identification, foot access, seasonal restriction on activity and/or a biological monitor; and FP-17 requires that trees be felled

away from any exclusion zone, which would include freshwater shrimp habitat. In addition, Wetland-02 requires a buffer of 50 feet around riparian areas or a biological monitor and Hot Zone-1 requires PG&E to avoid pools and streams that may be habitat for the species and where streamside vegetation would, to the extent possible, not be removed, pruned, or modified.

Because of the limited distribution of California freshwater shrimp and its habitat, even relatively small habitat losses that result from covered activities could be a significant impact and mitigation is required. ~~Thus, impacts on this species or habitat would be mitigated through the acquisition, preservation, and/or enhancement of habitat through MM BIO-1, from which other special-status freshwater species may also benefit. With mitigation, impacts on California freshwater shrimp would be less than significant.~~

Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle is closely associated with its host plant, elderberry, which occurs throughout the Permit Area; however, the range of the beetle is currently restricted to eastern Alameda, Contra Costa, and Solano Counties. BMP-14 requires surveys for elderberry plants by a qualified individual prior to conducting vegetation management activities in areas of potential habitat for valley elderberry longhorn beetle. Removal of elderberry shrubs occupied by beetle larvae or pruning of occupied stems (greater than 1-inch diameter at ground level) could result in mortality of larvae or adults. Elderberry shrub removals are avoided to the extent practicable and, in addition to implementation of FP-01 through FP-17, O&M and minor new construction activity impacts on valley elderberry longhorn beetle are addressed in PG&E's *Valley Elderberry Longhorn Beetle Conservation Plan* and associated federal permit, which requires annual employee training on elderberry identification, tracking and reporting impacts on elderberry to the USFWS, and providing compensatory mitigation for habitat impacts. With the continued implementation of the valley elderberry longhorn beetle program, impacts on valley elderberry longhorn beetle will continue to be less than significant and no mitigation is required.

Butterflies

Six special-status butterfly species are likely to occur or have potential to occur in the Permit Area: Bay checkerspot butterfly, San Bruno elfin butterfly, Mission blue butterfly, Lange's metalmark butterfly, Callippe silverspot butterfly, and Myrtle's silverspot butterfly. The occurrence of these species (as eggs or larvae) is associated with presence of a relatively limited array of preferred host plants on which larvae feed. Aside from female deposition of eggs on preferred host plants, adults generally seek nectar on a wider variety of flowers. Potential impacts on special-status butterfly species, ~~include including the loss of larval host and nectar sources and direct mortality of larvae and adults, as a result of O&M and minor new construction activities. PG&E will incorporate would be avoided by PG&E implementing butterfly-specific, Hot Zone measures (Hot Zone-3, Hot Zone-4, and Hot Zone-5) identified from PG&E's Bay Area O&M HCP, including as well as FP-01 through FP-17, as described under PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures.~~ Specifically, FP-01 through FP-04, FP-05, FP-07, FP-09, FP-10, FP-12, and FP-14 would avoid and minimize impacts on special-status butterflies. FP-01 requires annual training on HCP requirements; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-07 restricts speed on unpaved roads (15 mph) to reduce potential for collisions; FP-09 reduces fire risk

in wildland areas; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-12 requires establishment of an appropriate location for covered soil stockpiles; and FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance. In addition, under the environmental review process described in Section 2.9, PG&E would identify whether planned O&M or minor new construction activities would occur in special-status butterfly habitat and require measures to avoid, to the extent possible, impacts on larval host plants of special-status butterfly species and impacts on adults. Habitat for these species is mapped as sensitive in PG&E's screening system and, as federally listed species, any impacts on these species are addressed under PG&E's existing federal permit. With implementation of the HCP AMMs and PG&E's screening procedures and permit requirements, potential direct and indirect impacts on special-status butterflies as a result of O&M and minor new construction activity would be less than significant and no mitigation is required.

Bumble Bees

Two special-status bumble bees are likely to occur in the Permit Area: Crotch bumble bee and western bumble bee. Both require nectar and pollen sources and access to nesting or overwintering sites, including abandoned rodent burrows or disturbed soils under woody or debris. Individuals of these species, including adults, pupae, larvae, or eggs could be crushed or killed if nests or underground overwintering sites are crushed by vehicles, equipment, or foot traffic or under stockpiled soil. Above ground, adults could be injured or killed by moving vehicles or equipment. PG&E ~~will~~ would incorporate AMMs from PG&E's Bay Area O&M HCP, including FP-01 through FP-04, FP-07, FP-10, FP-11, FP-12, and FP-14, as described under *PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures*. FP-01 requires annual training on HCP requirements; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-07 restricts speed on unpaved roads (15 mph) to reduce potential for collisions; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; and FP-12 requires establishment of an appropriate location for covered soil stockpiles. With these measures incorporated into the project, and because issuance of the ITP is not expected to result in substantially increased impacts from ongoing O&M and minor new construction, potential impacts on special-status bumble bees would be less than significant and no mitigation is required.

Fish

Many of the larger, more significant water features within the study area, including estuaries, rivers, and creeks, are known, or have the potential, to support a variety of ~~special-status~~ fish species, including special-status fish species. Generally, O&M or minor new construction activities do not occur in these waters without acquiring required permits from agencies who have jurisdiction over specific activities in such waters. While overhead facilities are typically outside of these areas, directional boring (for certain pipeline activities) occurs below streams or channels, where CDFW or USACE or CDFW typically requires a "frac-out" plan as a standard permit condition (see APM HYDRO-1 in Section 3.9, *Hydrology and Water Quality*). Although suitable aquatic habitat for special-status fish species occurs within the Bay Area, direct impacts on fish and fish habitat are not anticipated by this project, because consistent with current practice, O&M or minor new construction activities would not occur within the water features and associated riparian areas without acquisition of appropriate permits for impacts involving streams and other jurisdictional

waters. Without permits, fish could be injured or killed by temporary dewatering activity or habitat could be degraded by excavations or substantial changes to of lake or stream bed, bank, or channel. ~~When If~~ permits ~~were are~~ required and obtained, they ~~would~~ include measures to further avoid and minimize direct impacts on ~~special-status fish and fish-wildlife~~ habitat such as seasonal work restrictions and specific dewatering protocols. In addition, impacts on ~~estuaries, rivers, and streams, rivers,~~ and the special-status fish species that they contain would be avoided by implementing water quality BMPs.

BMPs implemented by PG&E for the protection of surface waters (~~including waterbodies with defined bed/banks as well as~~ vernal pools and swales) are described in PG&E's *Good Housekeeping Activity Specific Control Plan* (also discussed in Section 3.10). The manual includes a wide variety of measures that are implemented based on site conditions and the nature of the activity. Commonly used measures include the following, which are currently being implemented in the study area:

- Conduct activities near water features during the dry season. If work is necessary during the rainy season, it would be conducted during dry spells between rain events to the extent feasible.
- Refuel at least 100 feet from water features. Vehicles operating adjacent to water features would be inspected and maintained daily to prevent leaks.
- Keep spill cleanup kits on site (with fueling and maintenance vehicles) and accessible at all times.
- Train all personnel with regard to the location, use, and contents of the spill kits. If a spill occurs, clean it up immediately with absorbents, notify the Environmental Field Specialist, and dispose of the materials properly.
- Minimize hazardous material storage onsite and store hazardous liquids, wastes, and all chemicals in watertight containers with appropriate secondary containment. Contain and protect stockpiled waste materials and cover liquid pollutant containment BMPs prior to rain, at the end of each day, and during non-work days.
- Monitor BMPs daily during construction activities. Repair, replace, and/or maintain BMPs to correct any deficiencies.
- Return work areas to their pre-existing contours and conditions upon completion of work. Restoration work, including revegetation and soil stabilization, would be evaluated upon completion of work and performed as needed.

Implementation of these BMPs and any required permit measures would minimize impacts on water quality by controlling potential pollutants, including sediment, and runoff discharges from the site. PG&E would also continue to comply with the requirements of SWRCB's Order No. 2009-0009-DWQ (as amended by 2010-0014-DWQ and 2012-0006-DWQ) (Construction General Permit), which requires the implementation of a stormwater pollution prevention plan (SWPPP) for activities disturbing 1 acre or more of land and/or partially outside of the existing ROW. Stormwater discharge for activities that disturb areas less than 1 acre and/or are wholly within the existing ROW would continue to be addressed through the application of the BMPs for water quality described above.

To specifically address erosion and siltation for activities that disturb less than 1 acre of land, PG&E would return water features to their approximate pre-construction grade and would manage disturbed areas with a combination of temporary and permanent vegetative stabilization measures,

including reseeded where appropriate in accordance with PG&E's BMPs for water quality. Where appropriate, PG&E would also continue to install and maintain a stabilized entrance and exit to work areas, as well as restore disturbed entrance and exit areas to their approximate pre-construction contours following the completion of minor new construction activities. In addition, PG&E would minimize the disturbance area, soil erosion, and removal of vegetation in accordance with PG&E's applicable Bay Area O&M HCP AMMs, including FP-02, FP-03, FP-04 and FP-10. As a result, potential impacts on fish would not be substantially adverse and would be less than significant. FP-16 and Wetland-2, which require maintenance of work buffers around riparian habitat, would also be implemented. Therefore, O&M and minor new construction activities would not affect water quality in occupied fish habitat downstream of the activities.

PG&E's BMPs for water quality require the monitoring and reporting of environmental impacts associated with construction or operational activities to ensure regulatory compliance and protection of resources. PG&E would continue to coordinate with and obtain any required authorizations from USACE, CDFW, and RWQCB on a per-activity basis (as required) when working within special-status fish habitat. O&M activities within fish habitat would be conducted in accordance with the additional permit measures. Therefore, O&M and minor new construction activities are not anticipated to have any effect on special-status fish species, and any impacts would be less than significant. No mitigation is required.

Amphibians

Special-status amphibians that may occur within the study area include California tiger salamander (Central California DPS and Sonoma County DPS), California giant salamander, Santa Cruz black salamander, red-bellied newt, western spadefoot, California red-legged frog, and foothill yellow-legged frog.

California tiger salamander and western spadefoot breeding habitat consists of ephemeral freshwater sources, primarily vernal pools and stock ponds. Following breeding, these species disperse into nearby upland habitat where burrows are used for shelter and aestivation. California giant salamander, Santa Cruz black salamander, and red-bellied newt are typically associated with coastal oak woodland or coniferous forests (Thomson et al. 2016). Adults are terrestrial but move into streams or creeks to breed. California red-legged frog uses aquatic habitat (consisting of ponds or drainages) in grassland and woodland habitats year-round. Adults may take refuge during dry periods in rodent holes or leaf litter in annual grassland, oak woodland, chaparral, and riparian habitats and may move through these habitats during overland migration to and from aquatic habitat. Foothill yellow-legged frog is typically associated with shallow, flowing streams with some form of rock or cobble substrate (Lind et al. 2016). The species is rarely observed far from perennial water sources (Nussbaum et al. 1983) but suitable breeding and foraging land cover types adjacent to perennial streams include riparian and coniferous forests, coastal scrub, and wet meadow types (California Wildlife Habitat Relationships 2000).

As a matter of current practice, PG&E avoids and minimizes the siting of facilities and work areas in riparian and wetland areas as much as feasible. As discussed in Impact BIO-3, any necessary state and federal permits are acquired prior to work in a riparian or wetland habitat. If PG&E were to perform work in a riparian area near potentially occupied aquatic habitat, a PG&E biologist would minimize the work area to the greatest extent possible to reduce the potential for the injury or mortality of amphibian species (APM BIO-3, Wetland-2, FP-10, FP-16). PG&E facilities are generally not located within water because water can erode or degrade facilities and restrict accessibility for

maintenance and repair. Where facilities cross streams or other aquatic areas, overhead facilities (electric transmission and distribution lines) typically span drainages and the ground infrastructure components (poles or towers) are usually located outside of riparian areas. In these cases, the impacts on special-status amphibian breeding habitat would be minimal, because aquatic habitat would not be affected or disturbed. Gas lines or underground electric lines that cross streams are typically co-located along bridges, tunneled under waterways, or span the stream or drainage. O&M work on these facilities is usually completed with minimal impact on the aquatic habitat or associated riparian areas. Vegetation management in riparian areas could remove suitable habitat for special-status amphibians and injure or kill individuals if they were present during the activity. As discussed in the previous section for fish, O&M or minor new construction activities would not occur within a jurisdictional water feature without acquisition of appropriate permits for such impacts, where special-status amphibians could be injured or killed by personnel or equipment during covered activities in aquatic habitat. Indirectly, species could be affected by degraded water quality from erosion or contamination from a spill. However, as described below, a small amount of aquatic habitat for California tiger salamander is anticipated to be affected by covered activities (Table 3.4-6). Covered activities would also be subject to conditions of PG&E's O&M HCP and federal permit to minimize adverse impacts on California red-legged frog where habitat for that species also occurs.

~~Upland habitat for these species is~~ Upland habitats for California red-legged frog, California tiger salamander, and western spadefoot are also present in the Permit Area and activities such as grading, trenching, or excavation could result in direct mortality or injury ~~of California tiger salamander or western spadefoot adults~~ to adults of these species (e.g., those occupying burrows or soil crevices), particularly when these activities are implemented close to wetland habitats such as vernal pools and stock ponds. In an attempt to minimize direct mortality in an area that will be trenched, there may be instances where, in support of larger (more than 0.1 acre) O&M or minor new construction activities, PG&E would excavate potential California tiger salamander burrows to relocate individuals or otherwise attempt to reduce the potential for mortality at an area requiring trenching or other excavation activity.

Vehicles and equipment traveling to and from work areas within dispersal or upland habitat for special-status species could potentially crush or injure adults or juveniles when they are in terrestrial habitats. Frogs, salamanders, and spadefoot toads typically disperse at night when humidity is high or during periods of rainfall from fall through spring. Except in emergency conditions, crews perform O&M and minor new construction activities during daytime hours; therefore, the potential for death or injury of dispersing amphibians is low. A storm-related emergency would be the exception, when construction crews could be active at night and could take adult and juvenile amphibians that happen to be dispersing into or through the area. Maintenance and refueling of heavy equipment could result in the inadvertent release of sediment and hazardous substances into species habitat. Increased sedimentation or accidental spills of toxic fluids from vehicles or equipment could reduce the suitability of aquatic or adjacent upland habitat for special-status amphibians. Habitat restoration or enhancement activities related to California tiger salamander compensatory mitigation under MM BIO-1, while ultimately beneficial to a variety of special-status amphibians, could also result in injury or mortality of individuals of these species.

In special-status amphibian aquatic or upland habitat PG&E ~~will~~ would incorporate applicable BMPs and AMMs from PG&E's Bay Area O&M HCP, including FP-01 through FP-08, FP-10 through FP-17, and Wetland-02. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other

designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features, including small mammal burrows; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-06 requires inspection of pipes and culverts, prior to movement; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust; FP-08 prohibits dumping of trash at work sites; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-13 requires daily inspection and installation of escape ramps in trenches or excavations; FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance; FP-15 prohibits vehicle and equipment refueling within 100 feet of streams or within a secondary containment area; FP-16 requires a buffer of 50 feet from the edge of riparian areas, access route identification, foot access, seasonal restriction on activity and/or a biological monitor; and FP-17 requires that trees be felled away from any exclusion zone. In addition, Wetland-02 requires a buffer of 50 feet around riparian areas or a biological monitor. If permits were required and obtained for work in a jurisdictional water feature, they would include measures to further avoid and minimize direct impacts on special-status amphibians and habitat. All special-status amphibians encountered in the work areas during covered activities would be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area (APM BIO-2). Therefore, impacts on special-status amphibians, except for California tiger salamander, are considered less than significant and no mitigation is required.

PG&E modeled habitat for California tiger salamander, in cooperation with the USFWS and CDFW. There are approximately 41,152 acres of modeled habitat distributed across the Permit Area (Pacific Gas and Electric Company 2017a). For California tiger salamander (Central California DPS), it is estimated that over the 30-year permit term, O&M and minor new construction activity would result in the permanent loss of 2 acres of breeding habitat and 298 acres of upland habitat and the temporary loss of 25 acres of breeding habitat and 3,800 acres of upland habitat. Modeled habitat for the Sonoma County DPS encompasses approximately 2,404 acres in the Permit Area (Pacific Gas and Electric Company 2017a). For this DPS, O&M and minor new construction activities would result in an estimated permanent loss of 13 acres of breeding habitat and temporary loss of 80 acres of habitat. To avoid and minimize impacts on California tiger salamander (Central California DPS and Sonoma County DPS) and other amphibians, PG&E would incorporate FP-01 through FP-17 from PG&E's Bay Area O&M HCP. In addition, habitat assessments would be conducted pursuant to PG&E's environmental review process described in Section 2.9, when planned O&M or minor new construction activities would occur in potential habitat. PG&E would site and design new facilities to avoid impacts on occupied and suitable habitat for special-status species, in accordance with APM BIO-3. In addition to these measures, PG&E would restore habitat where more than 0.10 acre of special-status species grassland habitat may be affected by covered activities, as described in FP-14. PG&E would also implement APM BIO-5 for longer-term activities, requiring installation and maintenance of wildlife exclusion fencing and/or the presence of an onsite biological monitor. In addition, work buffers around suitable vernal pool, wetland, and riparian habitat would be implemented through Wetland-1 and Wetland-2. In areas determined as sensitive California tiger salamander habitat (through PG&E's California tiger salamander Hot Zone mapping), Hot Zone-6 would be implemented, requiring limited work activity (i.e., foot access only) unless a biologist identifies access routes for vehicles and equipment that minimize impacts on covered species, and limiting timing of activities to the dry season.

Even with the aforementioned measures, impacts on California tiger salamander (Central California DPS and Sonoma County DPS) breeding and upland habitat that result from covered activities could be significant, given that populations of these species are isolated and loss of existing habitat is increasing. Mitigation is required.

~~To ensure that such impacts are reduced to less than significant levels, impacts will be mitigated in accordance with MM BIO-1, through the acquisition, preservation, and/or enhancement of California tiger salamander habitat, which may benefit other special-status amphibian species not covered by the ITP (i.e., California red-legged frog). Habitat for these species is mapped as sensitive in PG&E's screening system and any impacts on federally listed species are addressed under PG&E's existing federal permit. With the implementation of MM BIO-1 and the other measures described, potential direct and indirect impacts on special-status amphibian species would be less than significant.~~

Reptiles

Seven special-status reptiles may occur in the Permit Area. ~~Species that~~ Four of those species may occur within sparsely vegetated habitat types in the Permit Area and include Alameda whipsnake, coast horned lizard, California legless lizard, and California glossy snake. Alameda whipsnake are primarily found in scrub and chaparral habitat. Coast horned lizard and California legless lizard require the presence of fine, loose soils and occur in sage scrub, dunes, alluvial scrub, annual grassland, chaparral, oak woodland, riparian woodland, coniferous forest, and saltbush scrub (Thomson et al. 2016). California glossy snake is nocturnal and occur in grasslands, fields, coastal sage scrub, and chaparral (Thomson et al. 2016).

~~Two species of garter snake~~ The three other special-status reptiles that may occur within the Permit Area are San Francisco garter snake, ~~and~~ giant garter snake, ~~and~~ western pond turtle. San Francisco garter snake inhabits primarily permanent freshwater wetlands and adjacent open water, using these areas for feeding, and adjacent grasslands and shrublands for upland cover and breeding within the western portion of the study area. Giant garter snake may occur in the eastern portion of the study area and inhabit agricultural wetlands and other waterways, including irrigation and drainage canals, ricelands, marshes, sloughs, ponds, small lakes, and low-gradient streams, as well as adjacent upland areas. Both species of garter snake occupy rodent burrows. Western pond turtle may occur throughout the study area and is usually found in stagnant or slow-moving freshwater habitats and associated upland habitats for nesting, overwintering, and overland dispersal (Jennings and Hayes 1994).

Most small-scale O&M activities involve small areas and few personnel and vehicles. Special-status reptiles (adults or juveniles) would likely move away from the source of disturbance, and activities would not typically require the removal of vegetation. Smaller-scale activities are generally conducted year-round from existing roads and have limited impacts on natural vegetation. There is a greater potential for larger-scale O&M activities and minor new construction to adversely affect individuals of the species, when movement of vehicles, removal of scrub or chaparral vegetation, or grading of roads during the day could result in the mortality of Alameda whipsnake, coast horned lizard, California legless lizard, and California glossy snake. Construction activities that include grading, trenching, or excavation could result in death or injury of adults, juveniles, or eggs. Adults and hatchlings of coast horned lizard and California legless lizard could be crushed by construction vehicles and equipment and also could potentially crush California glossy snakes by collapsing small burrows. Habitat restoration or enhancement activities related to Alameda whipsnake

compensatory mitigation under MM BIO-1, while ultimately beneficial to a variety of special-status reptiles, could also result in injury or mortality of individuals of these species.

Suitable aquatic and upland habitat for San Francisco garter snake may be removed or temporarily disturbed by O&M or minor new construction activities, which could result in the injury, mortality, or disturbance of ~~giant~~ San Francisco garter snakes. Ground-disturbing activities (grading, trenching, or excavating) could crush or bury newborn, juvenile, and adult San Francisco garter snakes and giant garter snakes in upland areas and as well as snakes using adjacent aquatic areas for dispersal, basking, foraging, or sheltering. Construction vehicles and equipment traveling to and from work areas also could potentially kill garter snakes when traveling through upland habitats or crush them by collapsing small burrows that snakes may be using for cover, hibernation, or dispersal. San Francisco garter snake is a fully protected species. Take of the species, which is prohibited by law, would be avoided by implementing Hot Zone-7, which requires covered activities to be conducted during the snake's active season, removal of vegetation with hand tools, pre-construction surveys, and installation of exclusion fencing when working in modeled habitat for the species.

Aquatic and upland (overwintering, nesting) habitat for western pond turtle and aquatic and aestivation habitat for giant garter snake may be removed or temporarily disturbed by O&M or minor new construction activities and individuals may be killed, injured, or disturbed by activities that remove suitable aquatic or upland habitat. Construction activities (such as grading and movement of heavy equipment) could result in the destruction of pond turtle nests containing eggs or young individuals if affected areas are being used for egg deposition.

PG&E, in cooperation with USFWS and CDFW, modeled habitat for Alameda whipsnake, identifying core habitat (where the snake is most likely to occur), perimeter core habitat (the area immediately surrounding core habitat), and dispersal habitat (suitable habitat beyond perimeter core habitat), drawing from information described by USFWS (2011a) and in the *East Contra Costa Habitat Conservation Plan/Natural Community Conservation Plan* (East Contra Costa County Habitat Conservation Plan Association 2006). There are approximately 10,800 acres of habitat in the Permit Area (Pacific Gas and Electric Company 2017a). According to the modeling, over the 30-year permit term, O&M and minor new construction activities would result in an approximate permanent loss of 34 acres of core habitat, 25 acres of perimeter core habitat, and 27 acres of dispersal habitat. Covered activities would result in an approximate temporary loss of 13 acres of core habitat, 70 acres of perimeter core habitat, and 329 acres of dispersal habitat.

PG&E would implement FP-01 through FP-17 from PG&E's Bay Area O&M HCP designed to avoid and minimize impacts on Alameda whipsnake and other special-status reptiles. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-06 requires inspection of pipes and culverts, prior to movement to prevent harm to animals; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust and reduce potential for running over snakes; FP-08 prohibits dumping of trash at work sites; FP-09 reduces fire risk in wildland areas; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-13 requires daily inspection and installation of escape ramps in trenches or excavations to reduce potential for entrapment of species; FP-14 requires revegetation of

grassland areas where covered activity results in 0.1 acre or more of disturbance; FP-15 prohibits vehicle and equipment refueling within 100 feet of streams or within a secondary containment area; FP-16 requires a buffer of 50 feet from the edge of riparian areas, access route identification, foot access, seasonal restriction on activity and/or a biological monitor; and FP-17 requires that trees be felled away from any exclusion zone. In addition, work buffers around suitable wetland and riparian habitat would be implemented through Wetland-2. In areas determined as sensitive Alameda whipsnake habitat (~~through PG&E's Alameda whipsnake Hot Zone mapping~~ a "Hot Zone" for this species was defined as core and perimeter core habitat), APM BIO-8 would be implemented, requiring a pre-activity survey for Alameda whipsnake in core habitat when the species can be detected. PG&E would also conduct habitat assessments, pursuant to its environmental review process described in Section 2.9, to identify when planned O&M or minor new construction activities would occur in potential habitat.

To further reduce potentially significant impacts, PG&E would site and design new facilities to avoid impacts on occupied and suitable habitat for special-status species, in accordance with APM BIO-3. PG&E would also implement APM BIO-5 for longer-term activities, requiring installation and maintenance of wildlife exclusion fencing and/or the presence of an onsite biological monitor. All special-status reptiles encountered in the work areas during covered activities would be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area (APM BIO-2). With incorporation of the FPs, BMPs, Hot Zone AMMs, and APMs, impacts on special-status reptiles, except for Alameda whipsnake, are considered less than significant and no mitigation is required.

~~Nevertheless, given the restricted range of the species, impacts on Alameda whipsnake habitat that result from covered activities could still be significant and mitigation is required. To reduce impacts to less than significant levels, MM BIO-1 would be implemented to acquire, preserve, and/or enhance Alameda whipsnake habitat, which may benefit other special-status reptile species. Habitat for these species is mapped as sensitive in PG&E's screening system and any impacts on other federally listed species that may be present in the Permit Area are addressed under PG&E's existing federal permit. With the implementation of the HCP AMMs, APMs, and mitigation measure, potential direct and indirect impacts on special-status reptile species would be less than significant.~~

Birds

Thirty special-status avian species¹¹ are likely to occur or have the potential to occur in portions of the Permit Area, depending on the species' ranges and specific habitat requirements. This section describes the potential impacts on special-status bird species and other protected¹² nesting bird species that may result from the continuation of the O&M activities and the implementation of minor new construction activities. Lesser sandhill crane, greater sandhill crane, and mountain plover do not nest in the Permit Area but could use the area during winter or migration. Following the discussion of potential impacts, this section also discusses the general and specific protection measures and HCP AMMs that PG&E ~~will~~ would continue to implement to avoid and minimize impacts on special-status birds.

¹¹Additional information on each species' distribution and life history is provided in Table 3.4-4.

¹² Many common bird species are also protected under the MBTA and Sections 3503, 3503.5, 3513, and 3800 of the California Fish and Game Code.

PG&E's O&M and minor new construction activities may result in temporary impacts on habitat and temporary impacts on bird behavior due to increased noise, increased visual disturbances, and ground vibrations. Vegetation trimming or removal within and immediately adjacent to nesting habitat could result in the disruption of nesting behavior or loss of nests. Permanent impacts on habitat could result from installation of new facilities (e.g., a new wooden distribution pole, gas pipeline electronic testing station); however, these impacts would be small and distributed across a broad area. Most O&M activities are implemented in previously disturbed or urbanized areas and in existing gas and electric ROWs and existing access roads. Therefore, impacts on suitable nesting, wintering, and foraging habitat are anticipated to be minimal. Furthermore, covered activities would involve continuing O&M on existing gas and electric infrastructure and would not result in a substantial increase in disturbance to nesting, wintering, and foraging habitat. Greater sandhill crane is a fully protected species; take of the species, which is prohibited by law, would be avoided.

Aerial patrols of utility infrastructure, as well as specific O&M activities on existing electric infrastructure, may require the occasional use of fixed-wing aircraft, helicopters, and ~~possibly~~ drones. Drones would be used for inspections in areas with poor access or thick vegetation, and they would comply with all applicable rules and regulations. The use of drones ~~within~~ will occur within the ROW and noise adjacent to nesting bird habitat has the potential to disturb or alter the behavior of nesting birds. Any disturbance to incubating birds could cause nest abandonment and failure. However, the use of fixed-wing aircraft, helicopters, and drones for inspecting telecommunication sites is infrequent and does not typically require hovering in one location. Further, they are generally operated at high elevations and well above nesting, wintering, and foraging habitat. Therefore, impacts from aerial inspections are expected to be less than significant.

To help avoid and minimize impacts on nesting birds, PG&E has developed an Avian Protection Plan (APP) (Pacific Gas and Electric Company 2017b). The APP is implemented by biologists and other staff working on electric transmission and distribution facilities, as well as other PG&E activities near active bird nests (defined as nests containing eggs or young). PG&E is required to comply with federal and state laws and regulations that prohibit take of birds, including eggs or young, in active nests. Implementation of the APP includes the following:

- Utilizing avian-safe configurations for construction of new electric power facilities (i.e., poles), including framing for raptor protection (by increased separation of energized components), to the extent feasible.
- Utilizing insulation or other bird protection materials on exposed equipment leads during equipment repairs or pole retrofits.
- Providing a step-wise approach for reducing impacts on nesting birds that include:
 - Desktop review of activities by a biologist to determine the potential to impact nesting birds.
 - If, during nesting season, there is potential for an activity to impact nesting birds, pre-construction nesting bird surveys are performed.
 - When nesting birds are identified during surveys, nest buffers are assigned for the activity, depending upon species, nest phase, work activity duration, and other environmental factors (e.g., presence of visual screening).
 - For certain species (threatened, endangered, or state fully protected), PG&E will confer with USFWS and/or CDFW when a standard buffer cannot be observed for a nesting species and covered activities cannot be reasonably modified.

The APP also addresses efforts to reduce collision and electrocution risks to California condor throughout areas where condors are known to congregate naturally and as part of the Ventana Wildlife Society condor release program. The APP formalizes ongoing training requirements for utility employees. Training includes introduction to federal and state laws that protect birds; facility design to reduce avian interactions; information on identification of active bird nests; and reporting requirements pertinent to PG&E's Special Purpose Utility Permit, issued by the USFWS.

As summarized previously, PG&E would incorporate FP-01 through FP-17-18 from PG&E's Bay Area O&M HCP, as described under *PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures*, for all O&M activities. Specifically, FP-01 through FP-04, FP-06 through FP-10, ~~and FP-17, and FP-18~~ would avoid and minimize impacts on birds. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-06 requires inspection of pipes and culverts, prior to movement; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust; FP-08 prohibits dumping of trash at work sites; FP-09 reduces fire risk in wildland areas; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; and FP-17 requires that trees be felled away from any exclusion zone, which would include active bird nests. ~~PG&E would also implement its standard nesting bird protection measures to avoid and minimize disturbance to nesting birds to ensure compliance with applicable federal and state laws. With the implementation of the HCP AMMs as well as PG&E's standard nesting bird management practices, O&M and minor new construction impacts on special status bird species and other protected bird species would be less than significant. PG&E would also implement its standard nesting bird protection measures to avoid nests with eggs or chicks (FP-18) to ensure compliance with applicable federal and state laws. When covered activities occur in tidal marsh or coastal wetland habitats, Hot Zone-8 requires extra protections be implemented to minimize ground disturbance, including flagging access routes, hand carrying equipment, using protection mats, or using helicopters for access. In addition, covered activities within 700 feet of suitable habitat for Ridgeway's rail would be restricted to the non-breeding season (September 1 to January 15). This measure would also prevent disturbance to nesting California black rail and California least tern. Ridgeway's rail, California black rail, and California least tern are Fully Protected species, and take would be avoided. Disturbance to other coastal marsh nesting birds (e.g., yellow rail, western snowy plover) would also be minimized with this measure. When vegetation management staff is aware of known active northern spotted owl nests through either the CNDDDB viewer or property owner information, PG&E would implement BMP-15, which requires a limited operating period to be established within 0.25 mile of a known active nest from August 1 to January 31. If the work falls within the breeding period and can be more than 300 feet from the nest, hand tools (not chainsaws) would be used. If those protections are not feasible, PG&E's Avian Protection Program manager would be contacted for more guidance. In areas with mature conifers and redwoods, PG&E staff screen would work to avoid impacts on marbled murrelet and implement measures to avoid nests (FP-18), though most work would be conducted near roads and on vegetation that is not of suitable size to support murrelet.~~

~~To further reduce less than significant impacts, APM BIO-6 summarizes the nesting bird protection measures and includes the following steps required for work activities during the avian nesting season (generally March 1 through August 31). Golden eagle, bald eagle, peregrine falcon, and white-tailed kite are fully protected bird species. Take of these species, which is prohibited by law, would be avoided by implementing this measure. APM BIO-6a would be applied to avoid western~~

burrowing owl by identifying and avoiding active nesting or wintering burrows. All special-status birds encountered in the work areas during covered activities would be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area (APM BIO-2).

- A desktop review is conducted as part of the environmental review and planning process prior to initiating O&M activities that result in new surface disturbance or that may require vegetation trimming or removal in locations with suitable habitat for nesting birds.
- A biologist considers the type of O&M activity and location to determine if there are constraints to planned activities related to nesting birds.
- Depending on the activity type, time of year, and the results of the desktop review, a pre-construction nesting bird survey may be conducted to determine if there are active nests.
- Nesting bird surveys are conducted by a qualified biologist and are scheduled to occur within a timeframe prior to construction that is suitable for the detection of recently established nests.
- If active nests containing eggs or young are found, the qualified biologist establishes an appropriate nest buffer.
- Nest buffers are species-specific and range from 15 to 100 feet for passerines and 50 to 300 feet for raptors (2,640 feet for golden and bald eagle) depending on the planned activity's level of disturbance (low, medium, or high), site conditions, and the observed bird behavior. If necessary, buffer distances are flagged and communicated to crews before and during construction activities, and until the completion of construction activities in the vicinity of nests.
- Established buffers remain until work in the area has ended or a biologist determines the young have fledged or the nest is no longer active. Active nests are periodically monitored until the biologist has determined the young have fledged or all construction is finished. Vegetation removal by hand may be allowed within nest buffers or in areas of potential nesting activity, with a biologist's supervision. The biologist has authority to stop work if nesting pairs exhibit signs of disturbance.

With the implementation of the HCP AMMs, APMs, FPs, and BMPs, as well as PG&E's standard nesting bird management practices, O&M and minor new construction impacts on special-status bird species and other protected bird species would be less than significant. No mitigation is required.

Mammals

Thirteen special-status mammal species are likely to occur or have potential to occur in the Permit Area. These species include four bats (western red bat, Townsend's big eared bat, fringed myotis, and pallid bat), as well as Suisun shrew, Point Reyes mountain beaver, San Francisco dusky-footed woodrat, Sonoma tree vole, salt marsh harvest mouse, Point Reyes jumping mouse, San Joaquin kit fox, American badger, and mountain lion¹³. All special-status mammals encountered in the work areas during covered activities would be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area (APM BIO-2).

¹³ Additional information on each species' distribution and life history is provided in Table 3.4-4.

Bats

Pruning or removal of trees for O&M or minor new construction during the maternity season of bats (April 1 through September 15) and during the beginning of the hibernation period (November 1) may affect trees that provide suitable roosting habitat (cavities, crevices, furrowed bark, and foliage) for some special-status bats (western red bat, fringed myotis, pallid bat). Tree removal or pruning and noise associated with O&M and minor new construction activities could result in the injury, mortality, or disturbance of roosting bats if they are present in cavities, crevices, furrowed bark, or foliage of trees. Construction disturbance adjacent to bridges or other structures in the study area could disturb bats that may roost on these structures (pallid bat or maternity colonies of non-special-status bats). Mortality of roosting bats during the maternity season or hibernation period that results from tree removal or pruning trimming or other disturbances could affect individuals but is not expected to result in a substantial reduction in the local populations of these species. APM BIO-7 restricts covered activities that could affect special-status bat roosts during the breeding/pupping season if feasible. If not feasible, additional protections to evaluate and survey for special-status bat occupancy would be conducted by a qualified biologist. If active special-status bat roosts are found and the covered activity has the potential to cause disturbance, a protective buffer would be maintained around the roost (typically 250 feet) until the young are able to fly or the roosts are unoccupied. The roost would also be monitored by a qualified biologist during the covered activities. Existing ROWs have been subject to ongoing vegetation management activities, and impacts on special-status bats would be less than significant and no mitigation is required.

Suisun Shrew and Salt Marsh Harvest Mouse

Suisun shrew and salt marsh harvest mouse are known from marsh habitats in the Permit Area. O&M or minor new construction activity, including operation of equipment for land clearing, repair, or construction, could result in injury or mortality of these species. Noise and mechanical activity could result in temporary impacts on these species. To avoid and minimize impacts on marsh habitat and these special-status mammals, PG&E would incorporate FP-01 through FP-17 from PG&E's Bay Area O&M HCP, as described under *PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures*, for all O&M and minor new construction activities. Specifically, PG&E would implement FP-01 through FP-08, and FP-10 through FP-17 to avoid and minimize impacts on Suisun shrew and salt marsh harvest mouse. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-06 requires inspection of pipes and culverts, prior to movement to check for wildlife; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust and reduce chances for vehicular collisions with wildlife; FP-08 prohibits dumping of trash at work sites that may attract predators; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-13 requires daily inspection and installation of escape ramps in trenches or excavations to reduce risk of species entrapment; FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance; FP-15 prohibits vehicle and equipment refueling within 100 feet of streams or wetlands unless it is within a secondary containment area; FP-16 requires a buffer of 50 feet from the edge of wetland areas, access route identification, foot access, seasonal

restriction on activity and/or a biological monitor; and FP-17 requires that trees be felled away from any exclusion zone.

In addition to habitat assessments, pursuant to PG&E's environmental review process described in Section 2.9, marsh habitat is mapped as sensitive in PG&E's screening system and marsh habitat for special status mammals would be buffered according to Hot Zone-8 and Wetland-2 of the HCP AMMs. Hot Zone-8 requires extra protections be implemented while working in tidal marsh or coastal wetland habitats to minimize ground disturbance, including flagging access routes, hand carrying equipment, using protection mats, or using helicopters for access. Salt marsh harvest mouse is a fully protected species. Take of this species, which is prohibited by law, would be avoided by implementing these measures. With the implementation of the aforementioned measures, potential direct and indirect impacts on ~~special-status mammal species Suisun shrew and salt marsh harvest mouse~~ would be less than significant ~~and no mitigation is required. To further reduce less-than-significant impacts, APM BIO-7 would help identify, minimize, and avoid impacts on roosting bats during O&M and minor new construction activities.~~

Point Reyes Mountain Beaver, Point Reyes Jumping Mouse, San Francisco Dusky-Footed Woodrat, and Sonoma Tree Vole

The Point Reyes mountain beaver and the Point Reyes jumping mouse are restricted to the Point Reyes peninsula in Marin County. Mountain beaver create complex burrow systems in densely vegetated gullies. The jumping mouse is found in coastal meadows and in coniferous and riparian forests, and it uses burrows or dense vegetation for refugia. Sonoma tree vole occurs in coastal old-growth forests. The San Francisco dusky-footed woodrat occurs in chaparral and forest with a moderate understory and creates stick nests, primarily on the ground, although some occur in the tree canopy. Each of these special-status mammal species has the potential to occur in the Permit Area. Although vehicles and equipment associated with O&M or minor new construction activities could injure or kill an individual special-status mammal, this group is primarily nocturnal and most covered activities would occur during daylight hours. However, activities that include grading, trenching, or excavation could result in death or injury of adults and young of Point Reyes mountain beaver or Point Reyes jumping mouse if these species are present. Vegetation pruning or removal could destroy or remove the nests of Point Reyes jumping mouse, Sonoma tree vole, and San Francisco dusky-footed woodrat.

To avoid and minimize impacts on these special-status mammals and their habitat, PG&E would incorporate FP-01 through FP-17 from PG&E's Bay Area O&M HCP for all covered activities. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-06 requires inspection of pipes and culverts, prior to movement; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust; FP-08 prohibits dumping of trash at work sites; FP-09 would reduce fire risk in wildland areas susceptible to fire; FP-10 reduces the activity footprint and time onsite to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-13 requires daily inspection and installation of escape ramps in trenches or excavations; FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance; FP-15 prohibits vehicle and equipment refueling within 100 feet of streams or within a secondary containment area;

FP-16 requires a buffer of 50 feet from the edge of riparian areas, access route identification, foot access, seasonal restriction on activity and/or a biological monitor; and FP-17 requires that trees be felled away from any exclusion zone.

In addition to habitat assessments, PG&E's environmental review process described in Section 2.9 would require buffering of wetland and riparian habitat for special-status mammals (mountain beaver) according to Wetland-2 from PG&E's Bay Area O&M HCP. With the implementation of the aforementioned measures, potential direct and indirect impacts on ~~special-status mammal species~~ Point Reyes mountain beaver, Point Reyes jumping mouse, Sonoma tree vole, and San Francisco dusky-footed woodrat would be less than significant and no mitigation is required.

San Joaquin Kit Fox, American Badger, and Mountain Lion

Three larger special-status mammals, San Joaquin kit fox, American badger, and mountain lion have been known to occur in many portions of the Permit Area. Although there are few recent observations and mortality is unlikely as a result of covered activities, adults and young of San Joaquin kit fox and American badger could be killed or injured during ground-disturbing activities in grassland habitats if occupied dens collapse. Vehicles associated with O&M or minor new construction activities could kill individuals of any of these species while moving through work areas. Kit fox natal and pupping dens would be particularly vulnerable to disturbance from activities between March 1 and August 31. SJKF-1 would be implemented in modeled habitat for San Joaquin kit fox to identify and minimize disturbance to occupied dens in accordance with PG&E's Bay Area O&M HCP and the federal permit. As for the smaller special-status mammals, FP-01 through FP-17 from PG&E's Bay Area O&M HCP would be implemented for all covered activities. FP-01 requires annual training on HCP requirements for utility employees and contractors; FP-02 requires that vehicles and equipment be parked on existing roads or in other designated areas; FP-03 and FP-04 require use of existing ROW and minimization of disturbance and limits access routes to minimize impacts on vegetation and other natural features, including mammal burrows; FP-05 requires notification to the conservation land owner prior to work on protected lands; FP-06 requires inspection of pipes and culverts, prior to movement; FP-07 restricts speed on unpaved roads (15 mph) to minimize dust and reduce risk of vehicle collision with wildlife; FP-08 prohibits dumping of trash at work sites that may attract these species; FP-09 would reduce fire risk in wildland areas susceptible to fire; FP-10 reduces the activity footprint and time on-site to reduce potential for take of species; FP-11 requires erosion and sediment controls to prevent construction site runoff; FP-12 requires establishment of an appropriate location for covered soil stockpiles; FP-13 requires daily inspection and installation of escape ramps in trenches or excavations to reduce risk of wildlife entrapment; FP-14 requires revegetation of grassland areas where covered activity results in 0.1 acre or more of disturbance to reduce erosion and sedimentation; FP-15 prohibits vehicle and equipment refueling within 100 feet of streams or within a secondary containment area; FP-16 requires a buffer of 50 feet from the edge of riparian areas, access route identification, foot access, seasonal restriction on activity and/or a biological monitor; and FP-17 requires that trees be felled away from any exclusion zone. In addition, PG&E conducts its environmental review process, described in Section 2.9, to identify when planned O&M or minor new construction activities would occur in potential habitat. After surveys are conducted as part of this process or according to the focused survey requirements of APM BIO-9, San Joaquin kit fox and American badger dens would be avoided to the extent practicable. If a potential kit fox or badger den is in conflict (i.e., subject to direct impacts) with a covered activity for which there is no alternative, CDFW would be consulted in accordance with APM BIO-9 to determine if ~~additional~~ take coverage would be required to

complete the project. With the implementation of the aforementioned measures, potential direct and indirect impacts on American badger, San Joaquin kit fox, and mountain lion would be less than significant and no mitigation is required.

Critical Habitat

Portions of the PG&E utility infrastructure in the Permit Area cross critical habitat designated for a variety of plant and wildlife species as shown in Table 3.4-67.

Table 3.4-67. Critical Habitat in Permit Area

Species with Critical Habitat	Approximate Acreage of Critical Habitat in Permit Area (acres) and percentage of total in California (%)
Plant	
Franciscan manzanita	10 (4.4%)
Soft bird's beak	20 (0.9%)
Suisun thistle	20 (1.0%)
Baker's larkspur	56 (3.0%)
Yellow (golden) larkspur	19 (0.8%)
Contra Costa wallflower	42 (13.7%)
Contra Costa goldfields	1,136 (7.7%)
Antioch Dunes evening primrose	42 (13.7%)
Wildlife	
Conservancy fairy shrimp	324 (0.2%)
Longhorn fairy shrimp	12 (0.1%)
Vernal pool fairy shrimp	1,133 (0.2%)
Vernal pool tadpole shrimp	606 (0.3%)
Delta green ground beetle	32 (3.3%)
Bay checkerspot butterfly	1,731 (9.5%)
Delta smelt	20,293 (2.5%)
Chinook salmon	2 (0.1%)
Steelhead	70 (0.8%)
Tidewater goby	12 (0.1%)
California tiger salamander (Central California DPS and Sonoma County DPS)	6,210 (2.6%)
California red-legged frog	10,353 (0.6%)
Alameda whipsnake	4,240 (2.7%)
Western snowy plover	88 (0.6%)
Marbled murrelet	342 (0.1%)
Northern spotted owl	224 (0.0%)
Source: U.S. Fish and Wildlife Service 1978a and b, 1980, 2002, 2003a and b, 2006a through f, 2007a and b, 2008, 2010, 2011b and c, 2012, 2013a and b	
^a Critical habitat designations for individual species overlap in portions of the study area; therefore, the approximate distance crossed by PG&E pipelines is counted more than once in portions of overlapping critical habitat for different species.	

Temporary impacts on designated critical habitat resulting from O&M or minor new construction activities may occur during soil excavation, soil stockpiling, ROW access road repair, vegetation removal, and work at staging/laydown areas. Impacts in critical habitat areas would be primarily temporary disturbances and short in duration. Minimal amounts of permanent habitat disturbance (i.e., conversion of habitat to a facility footprint) would result from covered activities. Activities that may result in new permanent impacts on critical habitat would include the minimal expansion of existing facilities, including, for example, installation of new wood poles, pipeline cathodic protection, or electronic testing stations. In general, routine O&M activities are located on existing facilities in areas that have been previously disturbed, such as existing gas and electric transmission and distribution ROWs and access roads where suitable habitat for a special-status species is limited. Therefore, ongoing O&M activities would not create significant impacts on designated critical habitat. Minor new construction activities could also be implemented in designated critical habitat for a special-status species; however, because of the relatively small proportion of temporary and permanent impacts associated with this activity, significant impacts on critical habitat are not likely.

The O&M activities required for the existing gas and electric transmission and distribution infrastructure have been ongoing for decades and continue to be implemented on existing facilities. In addition, PG&E would implement the applicable AMMs from PG&E's Bay Area O&M HCP, as identified under *PG&E Practices, HCP Avoidance and Minimization Measures, and Applicant Proposed Measures*. FP-01 through FP-17 would be applied to all O&M and minor new construction activities. FP-01 would address potential impacts on critical habitat by requiring a worker education program that would cover site-specific biological resources. The area of disturbance would be confined to the smallest practical area, and work area boundaries would be delineated with flagging or other markings to minimize surface disturbance under FP-02, FP-03, FP-04, and FP-10. If a covered activity in critical habitat is unavoidable, PG&E would implement habitat restoration where 0.10 acre or more of special-status species grassland habitat may be affected by ground disturbance or vegetation removal during pre-construction, construction, operations, and decommissioning activities, in accordance with FP-14.

In order to reduce potentially significant impacts, PG&E would implement additional measures that specifically address impacts on critical habitat. In accordance with APM BIO-1 and APM BIO-3a, PG&E would implement weed management actions to prevent the spread of invasive weeds and nonnative species that could potentially alter critical habitats. In addition, PG&E would minimize the removal of vegetation and new site disturbance and would consider soil erosion and deposition, soil compaction, and disturbance to topography. In accordance with APM BIO-3, project siting and design would avoid unique plant assemblages, climate refugia, and occupied and suitable habitat for special-status species. In accordance with APM BIO-4, ~~special-status~~ NPPA rare and endangered plant occurrences would also be avoided to the maximum extent practicable.

To ensure that impacts are mitigated to a less-than-significant level, PG&E is proposing MM BIO-1, which provides mitigation for disturbance from permanent impacts on California tiger salamander and Alameda whipsnake critical habitat at a 3-to-1 ratio. With the implementation of MM BIO-1, along with the previously mentioned measures, potential impacts on critical habitat for these species would be less than significant.

Through MM BIO-1, PG&E would have an obligation to acquire mitigation lands at predetermined ratios on an ongoing basis for California tiger salamander, Alameda whipsnake, and California freshwater shrimp. Activities required for land management typically include vehicle use in or near