Vaca Dixon-Lakeville 230 kV Reconductoring Project

Final

Initial Study/Mitigated Negative Declaration

State Clearinghouse No. 2014092051

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Prepared For:

State Water Resources Control Board
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Acronyms and Other Abbreviations

µT	microtesla
ACS	American Cancer Society
AGR	agricultural supply
AMA	American Medical Association
APM	applicant-proposed measure
APP	Avian Protection Plan
BAAQMD	Bay Area Air Quality Management District
BMP	best management practice
CALFIRE	California Department of Forest and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCC	Central California Coast
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COLD	cold freshwater habitat
COMM	commercial and sport fishing
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CRPR	California Rare Plant Rank
CSA	Council on Scientific Affairs
CWA	Clean Water Act
dB	decibel
DOC	California Department of Conservation
DOE	U.S. Department of Energy
ESA	Endangered Species Act
EMF	electric and magnetic field
EMF RAPID`	EMF Research and Public Information Dissemination Program
EPA	U.S. Environmental Protection Agency
EST	estuarine habitat
ESU	evolutionarily significant unit
FAA	Federal Aviation Administration

FE	federally listed as endangered
FEMA	Federal Emergency Management Agency
FP	state-listed as fully protected
FRSH	freshwater replenishment
FT	federally listed as threatened
FYLF	foothill yellow-legged frog
g	gravity
GANDA	Garcia and Associates
General Permit	General Permit for Storm Water Discharges Associated with Construction Activity Order No. 2009-0009-DWQ
GHG	greenhouse gas
HCP	Habitat Conservation Plan
IARC	International Agency for Research on Cancer
IND	industrial service water supply
kV	kilovolt
kV/m	kilovolts per meter
L_{max}	maximum noise level
LED	light-emitting diode
LDS	light-duty steel
mG	milligauss
MIGR	migration of aquatic organisms
MND	Mitigated Negative Declaration
MRZ	Mineral Resources Zone
msl	mean sea level
MT	metric tons
MUN	municipal and domestic supply
MW	megawatts
NAHC	Native American Heritage Commission
NAV	navigation
NIEHS	National Institute of Environmental Health Services
NO_x	nitrogen oxide
NOA	naturally occurring asbestos
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	NOAA National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRHP	National Register of Historic Places
O_3	ozone
PG&E	Pacific Gas and Electric Company
PM	particulate matter

PRC	California Public Resources Code
PROC	industrial process water supply
project	Vaca Dixon-Lakeville 230 Kilovolt Reconductoring Project (also reconductoring project)
RARE	rare, threatened, or endangered species
RCNM	Roadway Construction Noise Model
REC-1	water contact recreation
REC-2	non-contact water recreation
ROW	right-of-way
RWQCB	regional water quality control board
SB	Senate Bill
SE	state-listed as endangered
SMARA	Surface Mining and Reclamation Act
SPWN	spawning, reproduction, and or early development
SR	state-listed as rare
ST	state-listed as threatened
SSC	species of special concern
State Water Board	State Water Resources Control Board
Swaim	Swaim Biological, Incorporated
SWPPP	Storm Water Pollution Prevention Plan
TAC	toxic air contaminant
TPZ	timberland preserve zone
TSP	tubular steel pole
UCMP	University of California Museum of Paleontology
USFWS	U.S. Fish and Wildlife Service
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
VELB	valley elderberry longhorn beetle
VdB	velocity decibels
V/m	volts per meter
VOC	volatile organic compound
WARM	warm freshwater habitat
WHO	World Health Organization
WILD	wildlife habitat
YSAQMD	Yolo-Solano Air Quality Management District

Glossary of Terms

Anchor Bolt
A bolt used to secure a tubular steel pole to its reinforced concrete foundation

Backhoe
Excavation equipment with a digging bucket on the end of a two-part articulated arm

Bucket Truck
A truck fitted with an elevated platform or bucket at the end of a hydraulic lifting system.

Cage-Top Extension
A structure, composed of multiple steel members connected by fasteners that is added to the top of an existing lattice steel tower. Cage-top extensions are typically installed to increase the existing tower's height for the purpose of increasing the ground-to-conductor clearance of the attached conductors.

Clearance
The distance between the lowest point of the conductor and the ground surface, or another feature.

Conductor
Overhead wires suspended from power line poles or towers that carry electricity.

Cross-arms
Steel or wood structures that protrude from power line poles or towers used to suspend conductors.

Drum Puller (or Puller)
A piece of heavy equipment used to pull wire through power line structures, generally from one pull site to another.

Guard Structure
A wooden pole or pair of poles that is installed where the reconductoring activity intersects a roadway, railway, walking path, power line, or other feature to prevent the reconductored line from falling onto the intersected feature, in the event of unanticipated loss in conductor tension during the reconductoring process. Crossing structures may be in the form of Y structures or H structures. Alternatively, bucket trucks or flower pots may be used in place of wood poles under certain site-specific conditions.

Guy Wire
A tensioned steel cable secured to a screw anchor and used to reinforce and stabilize a tower or pole

Insulator
Ceramic, glass, or composite material components used to attach the conductor to, and insulate electricity from, the crossarm.

Landing Zone (LZ)
A construction area used for helicopters to land and/or refuel, which can also be used as an area to stage and assemble construction equipment and materials

Lattice Steel H-Frame Structure
A free-standing open framework structure composed of a lattice of two vertical steel beams that are connected by a lattice steel crossarm, forming an "H" configuration. These structures are generally used to facilitate connections between transmission towers or poles, and substation equipment.

Lattice Steel Tower
A free-standing open framework tower composed of steel beams used to suspend transmission line conductor.

Light-Duty Steel Pole (LDSP)
A steel, free-standing power pole, directly buried into the ground similar to a wood pole, that does not require a reinforced concrete foundation. LDSPs may be guyed for stability.

Pull Site
A construction area used to stage equipment required for installing and removing conductor from towers or poles.

Rebar Cage
A steel rebar structure used to structurally support, frame, and reinforce a concrete foundation. The rebar cage is encased in the concrete.

Reconductor
Replace existing conductor with new conductor.

Reel Trailer (or Reel Truck)
A trailer used to carry reels of conductor.

Roller (or conductor pulley)
Wheel-shaped hardware that attach to crossarms to allow the conductor to be pulled through each structure easily, thus facilitating the removal of the existing conductor or the pulling of the new conductor to its final tension.

Sag Level
The combination of clearance and line arc that contributes to the level at which the conductor hangs between poles or towers

Screw Anchor
Steel component installed into the ground, to which a guy wire is attached and used reinforce and stabilize foundation of the structure

Shoofly
A temporary power line, installed during construction, that maintains electrical service to a substation while allowing portions of the permanent line to be taken out of service.

Snub Pole
Temporary wood poles buried directly in the ground and used as anchors to facilitate the installation of conductor

Sock Line
A rope line that is pulled through a line of towers during an intermediary step between removing old conductor and installing new conductor. The sock line is attached to the old conductor during removal, replacing it on the towers. The sock line is then attached to the new conductor and used in the pulling of the new conductor onto the tower line.

Span Length
The length of conductor between two adjacent power line structures or towers.

Splice
A joint between two conductor segments that are connected to form a longer continuous conductor segment

Substation
A facility containing hardware used to transform electricity between various transmission levels as well as from transmission levels to distribution levels, and that also serves as a centralized hub for exchanging electricity between various transmission systems and distribution systems.

Switch
Components mounted to a transmission line structure that allows a portion of a circuit to be taken out of service.

Tower Footing Bracket
A circular bracket secured within a concrete foundation and used as an attachment point to the base of a tubular steel pole

Truck-Mounted Augur
A hydraulic drill mounted on a truck that is used to excavate holes in the ground; often used for excavation of holes for pole installation.

Tubular Steel H-frame Structure
A free-standing structure comprised of two vertical steel poles that are connected by a steel pole crossarm, forming an "H" configuration. These structures generally are used to facilitate connections between transmission towers or poles, and substation equipment.

Tubular Steel Pole (TSP)
A free standing steel pole that supports conductor and is stabilized belowground by a reinforced concrete foundation.

Vibration Damper
Component used to suppress vibrations on taut transmission lines

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1 PROPOSED MITIGATED NEGATIVE DECLARATION

Project Name: Vaca Dixon-Lakeville 230 Kilovolt (kV) Reconductoring Project (project or reconductoring project)

Project Proponent: Pacific Gas and Electric Company (PG&E)
Contact: Brandon Liddell
245 Market Street
San Francisco, CA 94105

Project Location: This project includes modifications to the Vaca Dixon-Lakeville 230 kV transmission line, an approximately 40-mile line originating at Vaca Dixon Substation, located west of the intersection of Quinn Road and North Meridian Road in the City of Vacaville. The line heads generally west and terminates at Lakeville Substation, located at the intersection of Frates Road and Adobe Road in the City of Petaluma.

Project Description: To avoid potential line outages or load-shedding to customer in the North Coast and Northern San Francisco Bay Area, PG&E proposes to add 700 megawatts (MW) of electric transmission capacity to this line, which would allow the region's transmission system to accommodate projected peak summer load demands and remain online during outages elsewhere in the system. This increased capacity also would allow for increased operational flexibility and would provide a dependable supply of power. To add this capacity to the line, PG&E is proposing to replace the wires on (reconductor) the Vaca Dixon-Lakeville 230 kV transmission line between Vaca Dixon and Lakeville substations. The project includes:

- cage-top extensions to approximately 39 of 189 existing structures along the line
- modifying electrical hardware and equipment, including insulators at all existing structures to accommodate the new line ratings;
- reinforcing and stabilizing the foundation of one existing lattice steel tower by installing screw anchors and guy wires;
- replacing one existing light-duty steel pole with a tubular steel pole within Tulucay Substation;
- installing red light-emitting diode (LED) obstruction lighting, powered by solar panels, on approximately three to four towers, in accordance with Federal Aviation Administration (FAA) requirements; and
- modifications to equipment at Vaca Dixon Substation, Tulucay Substation, and Lakeville Substation to accept the new conductor.

PG&E anticipates that construction of the project would take approximately 16 to 24 months. The project is scheduled to begin construction tentatively in summer 2015, with an energization date in 2017 or as soon as possible after project construction.

Finding: This Initial Study (IS)/Mitigated Negative Declaration (MND) evaluates the potential for impacts from construction, operation, and maintenance of the project. Each section within this IS includes a completed checklist from the Governor's Office of Planning and Research California Environmental Quality Act (CEQA) Guidelines, Appendix G (California Code of Regulations Section 21080(c)[2]). This IS concludes that—with the implementation of specialized construction techniques, best management practices (BMPs), and applicant-proposed measures (APMs) identified in this document—the project would not result in significant impacts to the environment.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The project design incorporates APMs to minimize impacts on environmental resources. Consequently, as indicated by the following checklist, only the environmental factors checked would be potentially affected by this project to an extent involving at least one impact that is "less than significant with mitigation incorporated."

☐	Aesthetics	☐	Agriculture and Forestry Resources	☒	Air Quality and Greenhouse Gas Emissions
☒	Biological Resources	☒	Cultural Resources	☒	Geology and Soils
☒	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	☐	Mandatory Findings of Significance		

DETERMINATION

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that, although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

9/16/2014
Date

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2 INTRODUCTION

This section of the IS/MND is structured as an expansion of the CEQA Checklist and has been prepared to address the potential environmental impacts associated with the reconductoring of approximately 40 miles of transmission line and associated tower and substation modifications for the PG&E project. This IS/MND has been prepared in accordance with CEQA (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.). An IS is prepared by a lead agency to determine whether a project may have a significant effect on the environment. This IS relies on expert opinion based on facts, technical studies, and other substantial evidence to document its findings.

2.0 LEAD AGENCY

The State Water Resources Control Board (State Water Board) is serving as the Lead Agency under CEQA for this project.

2.1 DOCUMENT ORGANIZATION

This document has been organized to address all of the required content for an IS and negative declaration, in keeping with Sections 15063 and 15071 of the CEQA Guidelines. This document is organized as follows:

1 Proposed Mitigated Negative Declaration
2 Introduction
3 Project Description
4 Initial Study
- 4.0 Existing Conditions
- 4.1 Aesthetics
- 4.2 Agriculture and Forestry Resources
- 4.3 Air Quality and Greenhouse Gas Emissions
- 4.4 Biological Resources
- 4.5 Cultural Resources
- 4.6 Geology and Soils
- 4.7 Hazards and Hazardous Materials
- 4.8 Hydrology, Water Quality, and Beneficial Uses of Waters of the State
- 4.9 Land Use and Planning
- 4.10 Mineral Resources
- 4.11 Noise
- 4.12 Population and Housing
- 4.13 Public Services
- 4.14 Recreation
- 4.15 Transportation and Traffic
- 4.16 Utilities and Service Systems
- 4.17 Mandatory Findings of Significance

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3 PROJECT DESCRIPTION

3.0 OVERVIEW

Pacific Gas and Electric Company (PG&E) owns and operates a 230 kilovolt (kV) transmission line comprised of two circuits—Vaca Dixon-Lakeville 230 kV Transmission Line and Vaca Dixon-Tulucay-Lakeville 230 kV Transmission Line—collocated on a single alignment of lattice steel towers. These lines run between Vaca Dixon Substation in the City of Vacaville, Tulucay Substation near the City of Napa, and Lakeville Substation near the City of Petaluma and are collectively referred to as the Vaca Dixon-Lakeville Line. To improve reliability and accommodate forecasted growth in electric demands in Lake, Mendocino, Napa, and Sonoma counties, PG&E proposes to replace the 40 miles of the existing conductors with upgraded conductors (reconductor) that would increase capacity on both the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville lines as part of the Vaca Dixon-Lakeville 230 kV Reconductoring Project (project or reconductoring project). The project would be engineered and constructed pursuant to applicable engineering guidelines and standards (e.g., California Public Utilities Commission [CPUC] General Order Number 95), and would be built in accordance with PG&E's Avian Protection Plan and Raptor-Safe Construction and Wildlife Protection standard.

This chapter has been prepared in accordance with the California Environmental Quality Act (CEQA) Guidelines (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.). Specifically, this chapter describes the project objective, purpose, and need; project location; project components that would be constructed and/or modified as part of the project; right-of-way/permanent land requirements; construction methods; and operation and maintenance. Furthermore, the chapter discusses the permits and approvals anticipated to be necessary for project implementation, and Applicant-Proposed Measures (APMs) to reduce any impacts of project construction, operation, and maintenance.

3.1 PROJECT OBJECTIVE, PURPOSE, AND NEED

The Vaca Dixon-Tulucay-Lakeville and Vaca Dixon-Lakeville 230 kV lines provide electricity to the North Coast and northern San Francisco Bay Area, supplementing electricity from The Geysers[1] with electricity from other sources in the Sacramento Valley. In 2006, planning analyses were conducted to forecast summer 2017 peak demand; they indicated that if local generation is low, an outage of the Vaca Dixon-Lakeville Line would have the potential to overload the Vaca Dixon-Tulucay Line by 6 percent. Furthermore, a combined outage of the Vaca Dixon-Lakeville Line and the Lakeville-Geyser 230 kV Transmission Line (which also serves local customers) would have the potential to overload the Vaca Dixon-Tulucay-Lakeville Line by 17 percent. During these overload scenarios, potential would exist for outages or load-shedding (i.e., disconnection of the electric current on certain lines when the demand becomes greater than the capacity) to be necessary to protect the line. To avoid potential line outages or load-shedding, PG&E proposes to add 700 megawatts (MW) of electric transmission capacity to these lines, which would allow the region's transmission system to accommodate projected peak summer load demands and remain online during outages elsewhere in the system. This additional

[1] The Geysers is a large complex of geothermal power generation stations located in Sonoma and Lake counties.

capacity would allow for the line to carry more electricity, and allow more electricity to flow during situations when other lines in the system are out of service. This increased capacity also would allow for increased operational flexibility and would provide a dependable supply of power.

The primary objectives of the project are to:

- Maximize use of existing electric transmission infrastructure to meet forecasted capacity needs in Lake, Mendocino, and Sonoma counties and portions of Napa and Marin counties by increasing the capacity of the existing Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville lines.

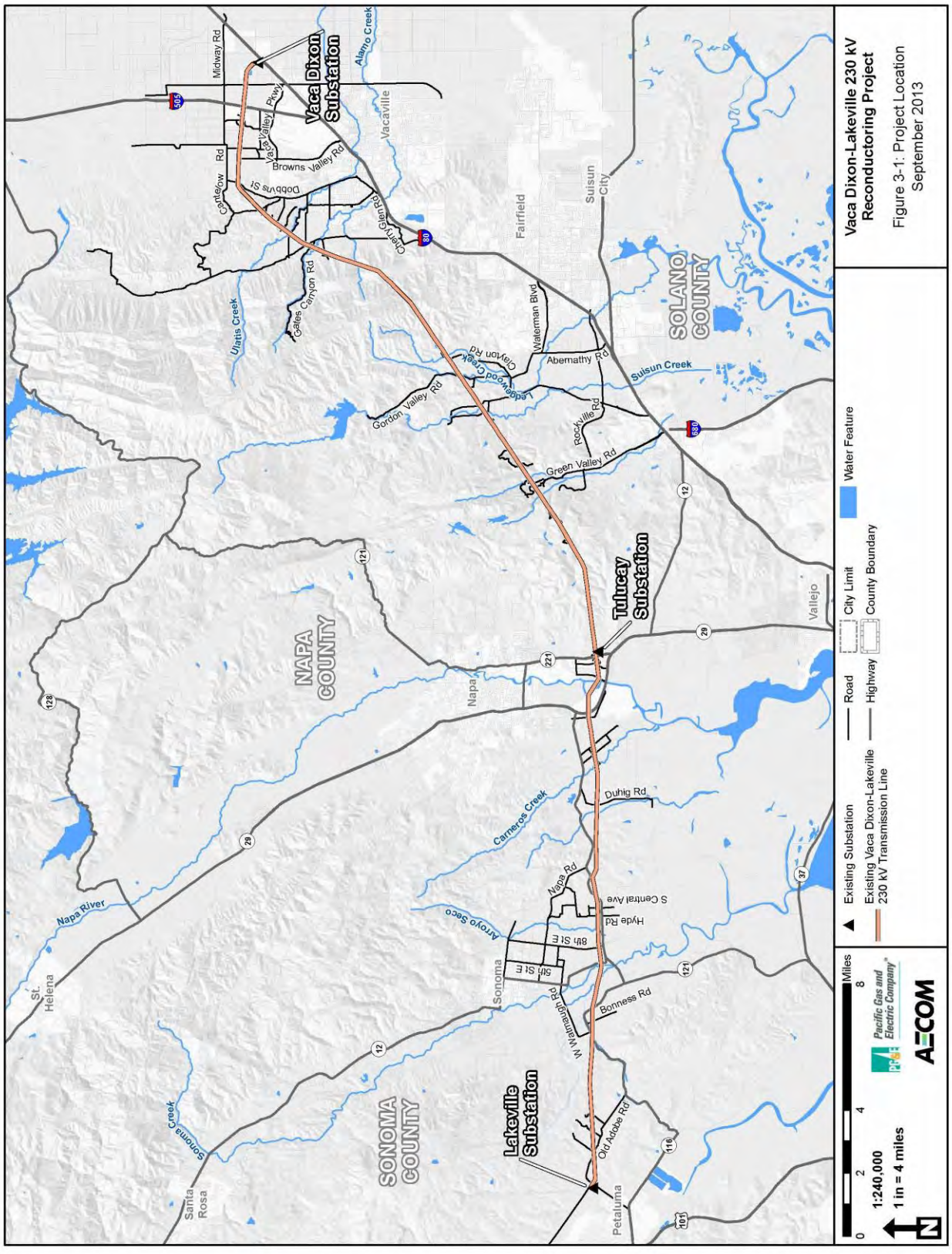
- Improve system reliability by replacing aging infrastructure that is serving electric customers in Lake, Mendocino, and Sonoma counties, and in portions of Napa and Marin counties.

The modifications and improvements associated with the project would provide the infrastructure necessary to maintain voltage and prevent load shedding for service areas.

3.2 PROJECT LOCATION

The existing transmission line corridor is located in Solano, Napa, and Sonoma counties, primarily spanning rural residential and agricultural areas. Agricultural uses in the existing transmission line corridor mainly consist of vineyards and livestock grazing lands. An overview of the project location is shown in Figure 3-1: Project Location. Beginning at Vaca Dixon Substation in the City of Vacaville (located just west of the intersection of North Meridian Road and Interstate 80), the existing transmission line corridor travels approximately 4.1 miles west to approximately Gibson Canyon Road north of Vacaville and then travels approximately 19.1 miles southwest to Tulucay Substation (located near the intersection of Highway 221 and Anderson Way) south of Napa. From Tulucay Substation, it travels approximately 16.9 miles west to Lakeville Substation (adjacent to the intersection of Old Adobe Road and Frates Road) near the City of Petaluma.

Prominent transportation routes crossed by the existing transmission line corridor include Interstate 505, Highway 12, Highway 29, Highway 116, Highway 121, and Highway 221. In addition, the corridor crosses several major waterways, including the Napa River and Sonoma Creek.


Vaca Dixon-Lakeville 230 kV Reconductoring Project
Figure 3-1: Project Location
September 2013
Vaca Dixon Substation
Lakeville Substation
Tulucay Substation
NAPA COUNTY
SONOMA COUNTY
SOLANO COUNTY
Vacaville
Fairfield
Suisun City
Vallejo
Napa
Sonoma
Petaluma
Santa Rosa
St. Helena
Napa River
Sonoma Creek
Suisun Creek
Cameros Creek
Alamo Creek
Ulatis Creek
Midway Rd
Vaca Valley Pkwy
Browns Valley Rd
Cantelow Rd
Dobbins St
Cherry Glen Rd
Gates Canyon Rd
Waterman Blvd
Abernathy Rd
Cleveland Creek
Clayton Rd
Gordon Valley Rd
Rockville Rd
Green Valley Rd
Duhig Rd
Napa Rd
S Central Ave
Hyde Rd
8th St E
5th St E
Arroyo Seco
W Watmaugh Rd
Bonness Rd
Old Adobe Rd
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Road
Highway
City Limit
County Boundary
Water Feature
0 2 4 8 Miles
1:240,000
1 in = 4 miles
N
Pacific Gas and Electric Company
AECOM

3.3 PROJECT COMPONENTS

The project would reconductor the existing Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville 230 kV transmission lines, and the work would include various tower and substation/switching station modifications needed to accommodate the reconductoring. Specifically, the project would include the following components:

- **Transmission Line Reconductoring:** Approximately 80 circuit miles of existing 230 kV transmission line—which are co-located along approximately 40 miles of existing lattice steel towers—would be reconductored, including approximately 40 miles along the Vaca Dixon-Lakeville Transmission Line and approximately 40 combined miles along the Vaca Dixon-Tulucay-Lakeville circuits.

- **Poles/Towers Modifications:** The existing conductors are supported by approximately 189 lattice steel towers, one light-duty steel pole, and six tubular steel poles. To accommodate the new conductor, various tower modifications would be required, including:

    - raising approximately 39 of the existing 189 lattice steel towers by installing cage-top extensions;

    - modifying electrical hardware and equipment, including insulators at all existing structures to accommodate the new line ratings;

    - reinforcing and stabilizing the foundation of one existing lattice steel tower by installing screw anchors and guy wires;

    - replacing one existing light-duty steel pole with a tubular steel pole within Tulucay Substation; and

    - installing red light-emitting diode (LED) obstruction lighting, powered by solar panels, on approximately three to four towers, in accordance with Federal Aviation Administration (FAA) requirements.

    Of the 39 cage-top extensions, approximately 18 would be installed for the purposes of reducing electric and magnetic field (EMF) at ground level, and the remaining 21 would be installed to accommodate the new conductor and ensure compliance with CPUC GO 95 clearance requirements.

    A more detailed discussion of EMF is provided in Section 3.9, Electric and Magnetic Fields Summary.

- **Substation Modifications:** Within Lakeville Substation, one existing H-frame lattice structure would be converted to a tubular steel H-frame structure to tie-in the upgraded lines. In addition, minor equipment modifications, including the replacement of termination equipment to handle 1,700 amps or greater under normal and emergency conditions, would be needed within the existing fenced areas at Vaca Dixon, Tulucay, and Lakeville substations. To provide system redundancy if any outages occur during construction, a temporary line would be installed at Tulucay Substation. This temporary line, which would

be active for approximately 180 days, would include a line of wood poles within 1,000 feet of the substation.

- **Distribution Line Modifications:** In two locations, existing distribution lines crossing beneath the Vaca Dixon-Lakeville Transmission Line would be lowered and reattached to their existing wood poles to provide safe clearance between the transmission and distribution conductors.

3.4 RIGHT-OF-WAY/PERMANENT LAND REQUIREMENTS

The existing right-of-way easement for the Vaca Dixon-Lakeville Line ranges between approximately 75 feet and 140 feet in width, with the majority of the easement being 75 feet wide. Because the reconductoring project would be constructed within the existing transmission line corridor, no additional permanent rights-of-way or easement expansions are needed to accommodate continued operation and maintenance of the line. No permanent expansions of substations or other associated facilities are proposed as part of the project.

3.5 CONSTRUCTION METHODS

3.5.1 GROUND AND HELICOPTER ACCESS

Access to the majority of the transmission corridor already is available to support routine operation and maintenance activities for the existing line. Construction crews, materials, and equipment primarily would access the project area by using several major roadways, including Interstate 80, State Highway 221, State Highway 12, State Highway 29, Suisun Valley Road, and Old Adobe Road, as well as local paved roads. In locations where access or construction activities may impact public roadways, traffic control protocols would be carried out in accordance with the California Department of Transportation (Caltrans) Construction Manual, which requires temporary traffic control planning any time the normal function of a roadway is suspended.[2] To prevent excessive congestion or traffic hazards during lane closures, before project construction, PG&E would develop traffic diversion plans that are in compliance with the Caltrans guidelines and applicable city and county policies for all locations of potential lane closures or width reductions. Construction activities that are in, along, and that cross local roadways would follow local jurisdictional encroachment permit requirements to minimize impacts to traffic and transportation in the project area. Before construction, PG&E would obtain all necessary transportation and/or encroachment permits from local jurisdictions and Caltrans for crossings and transport of oversized loads and certain materials.

The use of various public roadways and existing private dirt/gravel roads, used to access the existing transmission line corridor, would be used during construction. Various existing or historic dirt roads between structures may also be used for tower and/or mid-span access. To facilitate access to existing splice locations in the line, construction crews may use previously

[2] Traffic control protocols may include the implementation of rolling stops, which would include using uniformed officers in law enforcement vehicles with flashing lights to temporarily block on-ramps and slow traffic, to create a several-minute gap in the traffic flow to accommodate construction activities over the highway. Rolling stops typically are scheduled to occur during very light traffic periods, such as nighttime or early morning on a weekend, and have a duration of several minutes.

unmapped[3] access roads or overland travel routes to access mid-span locations. These routes would be identified prior to the time when construction on that section of line is started. The routes would be located in areas that have been previously surveyed for sensitive biological and cultural resources and would be sited to avoid impacts to any sensitive resources present. No tree removal or grading activities are anticipated along these access routes. However, minor vegetation trimming may be required to facilitate equipment access. Each access route would be surveyed and approved by the on-site biological monitor prior to use to ensure any sensitive biological resources are identified and avoided. If impacts to trees or sensitive resources are unavoidable, PG&E would mitigate the impacts with the mitigation measures identified in the mitigation monitoring and reporting plan.

PG&E may also grade new temporary unpaved roads or improve (e.g., rocking, mowing, grading, widening) existing dirt roads and temporary overland travel routes to provide access to the towers along the existing transmission line corridor. Passing lanes and/or turnouts may need to be established in non-environmentally sensitive areas, to accommodate vehicle and equipment access on an as-needed basis. Where roads intersect at angles that cannot accommodate the turn radius of construction equipment, PG&E would widen the corners of the turn apron. Typical construction equipment required for construction of unpaved roads and improving or modifying existing roads include a grader, compactor, and haul trucks.

Crews also may drive through drainages, use temporary bridges, and/or install temporary matting, as needed, to access work areas. In several locations where access roads cross drainages, creeks, or other water features, the project would require improvements to approximately 19 crossings, including installing new culverts, replacing existing culverts, and/or adding rock, rip rap or fill (dirt), to ensure the location is serviceable during construction and to allow for the safe passage of construction vehicles and equipment. In instances where culverts must be replaced, excavators or hand tools would be used to dig around and expose the culvert. Once exposed, it would be lifted from the drainage, using a backhoe or other piece of equipment, and hauled off site. Similarly, to install new or replacement culverts, the crossing would be prepared using backhoes and hand equipment. This work would include clearing a linear section of the drainage and removing extraneous debris. A new, appropriately sized culvert would then be placed at the crossing using a backhoe or equivalent equipment. The culvert would then be backfilled with native material and/or gravel. The majority of drainage crossing improvements would be permanent to allow for continued use of these crossings to support operation and maintenance activities after construction is completed.

An overview of the access roads that are planned to be used during project construction is provided in Table 3-1: Access Summary. Access roads and water feature crossing improvement locations also are depicted in Attachment A: Project Route Maps; however, minor adjustments may be required at the time of construction because of site-specific conditions, land-use changes, unanticipated impacts, and other unforeseen factors. After construction is completed, temporary roads or routes would be allowed to revegetate naturally or would be restored in coordination with relevant landowners, if needed. PG&E also would repair existing roads (that are directly damaged as a result of project construction activities) to pre-project conditions, in coordination with applicable landowners.

[3] Previously unmapped access routes refer to those routes not known at the time of this document's preparation.

Table 3-1: Access Summary

Type of Road	Road Surface/Improvements	Approximate Maximum Width (feet)	Approximate Maximum Length (feet)	Total Approximate Maximum Area (acres)
Existing Paved	No improvements would be required aside from repairing any damage caused by the project.	20	65,534	30.09
Existing Unpaved	Widening, grading, and/or vegetation removal may occur as necessary. Existing roads may be expanded at corners, passing areas, or intersections, to allow safe passage of equipment.	12	344,288	94.85
Overland Route	Vegetation removal may occur as necessary for fire prevention purposes.	12	42,354	11.67
Note: Acreages shown do not include previously unmapped mid-span access routes to existing splice locations in the line, as these routes would be identified in the field before construction activities at any particular location. Mid-span splice access is expected to require up to 8.2 acres of total disturbance.				

PG&E may also elect to access towers by crane or helicopter to deliver project personnel or construction materials. When helicopters are necessary for tower access, crews or construction materials would fly from designated landing zones directly to tower locations, typically utilizing Bell 500 Long Ranger, Bell 205 Huey, or similar helicopter types. PG&E would conform to all applicable FAA regulations and helicopters would be staged and refueled at designated helicopter landing zones, located along the existing transmission line corridor. Helicopter landing zones planned for use during construction are depicted in Attachment A: Project Route Maps.

3.5.2 TEMPORARY WORK AREAS

As described in detail in the following subsections, temporary work areas would be established to facilitate construction of the project. The final location and dimensions of temporary work areas would be determined immediately before construction to allow safe and efficient work activities while limiting ground disturbance to the minimum amount necessary. All temporary work areas would be located within the project study area as shown in Attachment A: Project Route Maps. A summary of these areas is provided in Table 3-2: Temporary Work Area Summary.

3.5.2.1 Construction Yards

Construction yards would be utilized for construction equipment and materials storage and assembly, personnel and construction trailer/vehicle parking, as a meeting area for project management and crews, and/or other project-related activities to support construction. PG&E may install temporary construction trailers, portable toilets, or other temporary facilities at the construction yards for the duration of the project. PG&E would use several existing PG&E-owned industrial facilities in the existing transmission line corridor, including, but not limited to equipment yards at Vaca Dixon, Tulucay, and Lakeville substations, as well as a gravel yard at the Vaca Dixon Solar Photovoltaic Plant near Vaca Dixon Substation.

Table 3-2: Temporary Work Area Summary

Work Space Type	Approximate Acreage	Estimated Quantity	Required Improvements	Approximate Total Acreage
Construction Yard	2.0-4.0	2	None	4.0-8.0
Tower Work Area	0.5-1.0	171	Vegetation removal and minor grading may be required	85.5-171
Guard Structure Work Area	0.1-0.5	114	Vegetation removal may be required	11.4-57
Pull Site	1.4-2.0	13	Vegetation removal and minor grading may be required	18.2-26.0
Helicopter Landing Zone	2.0-3.0	36	Vegetation removal and minor grading may be required	72.0-108.0

Generally, all proposed construction yards and material storage areas have been previously disturbed; thus, limited or no site preparation (e.g., minor grading, vegetation removal) is expected to be necessary. Access routes to these facilities are well established, and improvements to these routes are not expected to be needed. Use of existing PG&E facilities for staging would provide existing electricity for construction. PG&E-owned facilities also are generally secured with chain link fencing and lighting. As an alternative to PG&E-owned parcels, other nearby existing commercially available offices or properties, such as the Napa Pipe Project work site (located near the Napa River crossing), may be utilized, if available and in coordination with relevant landowners. These locations are expected to require limited or no preparation before use; however, security fencing may be installed to secure construction materials and equipment at these locations, as necessary and on-site security personnel may be retained.

The size of each construction yard would vary, depending on site-specific conditions and the area available for use. These areas typically are expected to range between 2 acres and 4 acres.

3.5.2.2 Tower Work Areas

To facilitate the installation of cage-top extensions, assist in the removal and installation of conductor, and/or allow access to work at tower bases, temporary tower work areas may be established at tower bases. Each of these temporary tower work areas is expected to be approximately 0.5 acre; however, construction activities may require up to 1 acre depending on the nature of the work occurring at any particular tower. All temporary tower work areas would be sited within the project study area[4] that was previously evaluated for sensitive resources. To prepare these work areas for construction, some site preparation may be necessary. Site preparation is not expected to be required for the majority of the temporary tower work areas, but in some instances it may include vegetation or crop removal, tree trimming, or grading/blading

[4] The project study area encompasses a 500-foot-wide corridor, centered on the existing project alignment as well as 25-foot buffers along unpaved access roads, overland access routes, and surrounding work areas that fall outside this corridor.

of equipment pads, as needed. When located within unpaved areas, graded tower work areas would be watered regularly to control fugitive dust. Gravel or other substrates may be temporarily applied to help further control fugitive dust, as necessary. Site restoration is not expected to be necessary; however, some stabilization measures may be implemented.

3.5.2.3 Guard Structure Work Areas

Before removing the existing conductors, temporary guard structures—typically consisting of either vertical wood poles with cross-arms or staged construction equipment—would be installed or mobilized at crossings of energized electric lines, communication facilities, and/or major roadways to prevent the conductors from sagging onto other lines or roads during removal or installation. To accommodate the installation of a guard structure, PG&E would establish an approximately 0.1-acre work area at each proposed crossing; however, a work area of up to 0.5 acre may be required, depending on site-specific conditions. When installing guard structures over roads, equipment typically would be staged within the road to minimize off-road disturbance. PG&E would follow standard safety practices, including installing appropriate barriers between work zones and transportation facilities, posting adequate signs, installing temporary guard structures where the line crosses major roads, establishing adequate on- and off-site parking and staging, and using proper construction techniques.

3.5.2.4 Pull Sites

To accommodate line trucks and other equipment necessary to remove and reinstall conductor, temporary pull sites would be established approximately every 2 miles along the transmission line corridor. In some locations of difficult terrain or sharp line angles, the pull sites may be spaced closer or farther apart. Approximately 13 pull sites would be located along the corridor, generally beneath or immediately adjacent to the existing line. These pull sites would be used during construction to stage conductor-pulling trucks and conductor reel trucks, which would facilitate the removal of existing conductor and installation of the new conductors onto the lattice steel towers. Snub poles (temporary wood poles to facilitate pulling operations) may be installed temporarily at various pull sites, to facilitate reconductoring activities during construction. Construction vehicles and equipment that is needed at the pull sites are expected to be staged or parked within the transmission line corridor or alongside access roads.

Transport vehicles (e.g., crew-cab trucks and/or half-ton pickup trucks) would be used to transport personnel to a pull site. To haul the conductor to a site, reel trailers with reel stands would be mounted on a line truck. On the line truck, pullers would be mounted to install the new conductor. The old conductor would be removed from the site on a line truck.

The locations of the pull sites would be sited within the larger potential pull site siting areas identified in Attachment A: Project Route Maps; however, the exact locations and footprints of the sites would depend on conditions on the ground and would not be determined until immediately prior to construction. Each pull site is anticipated to have a footprint of up to approximately 1.4 acres. These locations and footprints would be subject to change, based on construction constraints, site-specific conditions, final engineering, or other factors, and may be up to 2 acres in size. All pull sites would be sited within the project study area that was previously evaluated for sensitive resources. Site preparation is not expected to be required for the majority of the pull sites, but may include some vegetation or crop removal; tree trimming or

removal; or minor grading/blading of equipment pads, as needed. When located within unpaved areas, graded pull sites would be watered regularly to control fugitive dust. Gravel or other substrates may be temporarily applied to help further control fugitive dust, as necessary. Site restoration is not expected to be necessary; however, some stabilization measures may be implemented.

3.5.2.5 Helicopter Landing Zones

Helicopters are expected to be used to access project towers, deliver materials, and/or conduct tower and line work. To accommodate efficient helicopter work, off-site helicopter landing zones would be established temporarily to store and assemble materials during construction. In some instances, these helicopter landing areas would be located within or adjacent to construction material yards or pull sites. In other instances, they would be established within open, topographically flat areas, comprised of either ruderal or paved surfaces that may require grading or vegetation removal. Where possible, PG&E-owned parcels or other nearby existing industrial properties would be utilized for these activities. Generally, landing zones would be accessible by existing roads or overland routes, and would be set back from heavily-travelled public roadways to minimize views by local residents or motorists. When located within unpaved areas, landing zones would be watered regularly to control fugitive dust. Gravel or other substrates may be temporarily applied to help further control fugitive dust, as necessary. From these landing zones, helicopters would transport materials and crews to and from the towers, typically along the transmission line right-of-way. Equipment being transported typically would be attached to a long-line cable, attached to the helicopter. Crews on the towers would detach equipment while working on the towers, thereby eliminating the need for helicopters to land at tower locations. In addition, helicopters typically would deliver materials while hovering approximately 160 feet above the ground, which would greatly reduce any downwash or vibration experience on the ground.

The approximate locations of the helicopter landing zones are shown in Attachment A: Project Route Maps and would range in size from 2 to 3 acres. These locations and footprints would be subject to change, based on construction constraints, site-specific conditions, final engineering, and other factors. Final landing zones would be sited within areas previously evaluated for sensitive resources.

3.5.3 VEGETATION CLEARANCE

Portions of some pull sites, landing zones, tower work areas, and existing access roads would need to be established by tree trimming and vegetation clearing. Shrubs within these areas may be mowed and shredded or removed using a mower or similar equipment. Vegetation management equipment typically would include manual clippers, chainsaws, mowers, loaders, bulldozers, and/or shredders. Generally, removed vegetation would be shredded in place and spread nearby, except in cases where doing so may promote the substantial spread of noxious weeds. During clearing activities, vegetation would be mowed or grubbed, leaving root systems intact wherever possible, to encourage resprouting and minimize erosion.

3.5.4 EROSION AND SEDIMENT CONTROL AND POLLUTION PREVENTION

Project construction would include ground-disturbing activities (e.g., grading and vegetation clearing) in conjunction with the construction of necessary work areas and access road

improvements. As a result of these activities, which would total more than 1 acre for the reconductoring project, PG&E would obtain coverage under the California State Water Resources Control Board's (State Water Board) General Permit for Storm Water Discharges Associated with Construction Activity Order No. 2009-0009-DWQ (General Permit). To obtain coverage under the permit, PG&E would develop and submit permit registration documents, including a Notice of Intent, a Storm Water Pollution Prevention Plan (SWPPP), a risk assessment, a site map, certification, and an annual fee, to the State Water Board before initiating construction activities. In conjunction with the SWPPP, appropriate best management practices (BMPs) would be developed for each activity that has the potential to degrade surrounding water quality through erosion, sediment run-off, and other pollutants. These BMPs then would be implemented and monitored by a qualified SWPPP professional throughout project construction.

3.5.5 CLEANUP AND POST-CONSTRUCTION RESTORATION

Following completion of project construction, PG&E would restore temporarily impacted areas. This would include removal of construction debris (such as the existing conductor, packaging and old insulators), which would be hauled away for recycling or disposal at appropriate landfills. Existing access roads would not be revegetated because they would continue to be used for operations and maintenance. Overland access routes and temporary work areas would be reseeded or allowed to revegetate naturally. PG&E would repair existing roads that are damaged as a result of project construction activities to approximately pre-project conditions, in coordination with applicable landowners.

3.5.6 TRANSMISSION LINE CONSTRUCTION

3.5.6.1 Temporary Wood Poles

As previously described, temporary guard structures may be installed, at road[5] and aboveground utility crossings in instances when mobile equipment cannot be used for such purposes. Wood poles also would be used to install a temporary line at Tulucay Substation. Guard structures typically consist of paired single-Y-configured pole structures or paired H-configured wood poles that generally extend approximately 50 feet above ground, are buried approximately 7 feet below ground, and have a diameter of approximately 16 inches to 24 inches at ground level. These poles would have at least a 25-foot clearance above ground.

In addition, snub poles consisting of single wood poles may be installed temporarily at various pull sites, to facilitate reconductoring activities during construction. Snub poles would be approximately 80 feet in height and would be buried approximately 10 feet below ground. The temporary line would require a row of wood poles to be installed adjacent to Tulucay Substation. The dimensions of these wood poles would be similar to those used for guard structures.

To install temporary wood poles for guard structures, the line, and snub poles, construction work would begin by auguring holes approximately 2 feet in diameter and approximately 7 feet deep for guard structures, and approximately 5 feet in diameter and approximately 10 feet deep for snub poles. After the holes are augured, the poles, insulators, and hardware would be delivered to the guard structure work areas and assembled. The poles then would be placed in the holes using

[5] At road crossings, flaggers also may be used to direct the flow of traffic or pedestrians during reconductoring activities.

line trucks or cranes, the remaining void would be backfilled, and the surrounding area would be compacted. Wood poles would be direct buried (with no foundations or footings) and also may be guyed for stability. After a pole is embedded and the surrounding area is compacted, additional hardware would be added to the cross-arms using a bucket truck, as necessary. Prior to any belowground work, PG&E would notify and coordinate with Underground Service Alert regarding excavation or auguring plans to be completed as part of the project.

3.5.6.2 Pole Installation/Removal

One light-duty steel pole currently located within the fence line of Tulucay Substation would be replaced with a new tubular steel pole. Furthermore, one lattice steel H-frame structure within Lakeville Substation would be replaced with a tubular steel H-frame structure. To install the new tubular steel pole/structure, a truck-mounted augur would be used to excavate a hole for the foundation. The excavation would be up to 10 feet in diameter and up to 24 feet deep. Within this excavation, a rebar cage and tower footing bracket would be assembled and held in place using wooden forms. After the rebar, anchor bolts, and other metal hardware are in place, concrete would be poured within the excavation surrounding the rebar cage. After this concrete has cured, the forms would be removed and gravel would be poured around the base of the foundation. The new tubular steel pole/structure then would be assembled in place and would be installed on the foundation, using a crane.

After it is in place, the tubular steel pole/structure would be bolted to the new foundation and cross-arms and other hardware would be installed. The existing conductor then would be transferred from the existing structures using bucket trucks or other similar equipment. The existing structures then would be removed using a crane or helicopter and the excavations would be backfilled.

Where tree trimming was required for construction along the western edge of Tulucay Substation, trees would be pruned to minimize loss of visual screening of the substation. If existing trees were removed, they would be replaced with drought-tolerant trees, native to California. Similar plantings also may be installed to supplement and fill in the gaps within the existing hedgerow, located on the western side of the substation, to provide additional screening. All landscaping would be consistent with PG&E and CPUC safety, operations, and maintenance requirements for landscaping in proximity to a transmission facility.

3.5.6.3 Tower Modifications

Upgrades at existing towers, including tower raises, modification of aboveground hardware and equipment, and installation of LED devices (in accordance with FAA requirements), would require access to each tower along the transmission line corridor. Access to towers would be by existing roads, by overland travel, and/or by helicopter. Additional information regarding access is provided in Section 3.6.1, Ground and Helicopter Access.

Tower Raises

As previously described, cage-top extensions, ranging in height from approximately 15 feet to 16.5 feet would be installed at approximately 39 towers along the existing transmission line corridor. Cage-top extensions would arrive on site with minimal packaging—most of which would be recycled—and the cage-top extensions would be assembled at construction yards

before being delivered to tower work areas or helicopter landing zones using flatbed trucks. After it is delivered to a tower work area or a helicopter landing zone, each cage-top extension would be lifted into place on top of the existing tower using a crane or helicopter, and would be bolted onto the tower by construction crews. After cage-top extensions are installed on a string of towers, the conductors would be de-energized and elevated to their new position. The new insulator strings and conductor pulleys would be installed at this time to facilitate the reconductoring activities that follow. The old tower arms and insulator strings would be removed once the conductors are relocated to their new positions.

Tower Modifications

Minor tower modifications would be required at all towers, which may include replacement or upgrade of existing electrical hardware and equipment and modification or removal of tower arms. Solar-powered red LED obstruction lighting would also be installed on approximately three to four towers in accordance with FAA requirements. Towers would be accessed by helicopter, crane, and/or line truck. After being mobilized, crews would climb or be lifted or flown onto the towers, where the modifications would be conducted using hand tools.

Tower Reinforcement

One lattice steel tower, located approximately 0.35 mile southeast of the Highway 12 and Highway 29 intersection, would require foundation stabilization to accommodate the new conductor. Using a backhoe and line truck, approximately eight new anchors (screw anchors) would be installed—two per tower leg. After the anchors are in place, the steel cable would be secured and tightened between each anchor and the tower.

3.5.6.4 Conductor Installation

Before conductor removal or installation, the existing transmission line would be de-energized. The existing conductor first would be detached from its support structure and lifted temporarily. Rollers then would be installed at the conductor's attachment point and the conductor would be placed onto the rollers. The rollers would allow the individual conductors to be pulled through each tower. Installation of rollers and detachment of the existing conductor typically would require bucket trucks, cranes, or helicopters.

After the rollers are in place for an entire section of conductor between pull sites, the existing conductor would be pulled out of place using drum pullers and would be collected on reel trucks. The existing conductor would be attached to the new conductor and used to pull the new conductor into place. During this process, tension would be maintained on the line to prevent the line from sagging onto the ground or any structure below the line. After the existing conductor is fully removed from a section of towers, the sock line would be detached and reattached to the new reel of conductor. The sock line and new conductor then would be pulled back through the section of towers and the line tension and sag would be adjusted to pre-calculated levels. Because multiple reels of conductor would be needed to reconductor the longer segments, the reels would be spliced together. Splicing activities would be conducted by crews staged within bucket trucks, working from helicopters, or staged on boards attached to the tower. Typically 60- or 100-ton presses would be used to splice the ends of the lines together. After the conductors have been tensioned to the appropriate sag level, they would be clamped to the end of each insulator as the rollers are removed. The final step of the conductor installation would be to

install vibration dampers and other accessories. This process would be repeated for each of the six phases of conductor. An existing conductor would be removed from a site on a line truck. The removed conductor, packing crates, packing from new conductor, spare bolts, and other construction debris would be picked up and hauled away for recycling or appropriate disposal. PG&E would conduct a final inspection of the project site after cleanup activities are completed. After all the new conductor has been installed, a helicopter survey flight would be conducted to collect LIDAR data, in compliance with CPUC GO 95 clearance requirements.

3.5.7 SUBSTATION MODIFICATIONS

All planned modifications would take place within the fence line at Vaca Dixon, Tulucay, and Lakeville substations, all of which are located on existing PG&E-owned parcels. All new electrical equipment and hardware would be delivered to the respective substations and would be positioned using a crane within existing substation yards.

3.5.8 DISTRIBUTION LINE MODIFICATIONS

Minor distribution modifications are required at two crossing locations to obtain appropriate clearances to overhead transmission lines. The distribution work would include lowering the existing cross-arm 2 to 6 feet, depending on required clearance. To complete this work, crews would use a bucket truck to reach the existing cross-arms supporting the distribution lines. These cross-arms would then be detached from the wood pole and lowered the appropriate distance, and then reattached to the existing pole.

3.5.8.1 Distribution Switching Operations to Accommodate Construction Activities

To reconductor the power line, PG&E would need to temporarily take out of service specific sections of distribution lines that cross the power line or are co-located on the power line (also known as taking clearances). As part of ongoing operation and maintenance of the distribution system, PG&E's Distribution System Operations group would manage distribution clearances and balance the system by routing power to different lines. This normally includes turning existing distribution switches on and off, and installing additional switches if needed.

Distribution switches may be located along the distribution lines being taken out of service or along other distribution lines that may be affected by taking a line out of service. Some switches are operated at a central location such as a substation or are controlled remotely. Other switches are operated manually in the field by operations personnel using a bucket truck or similar equipment. Clearances may therefore be outside of the project corridor. The location where switching activities would be required depends on daily and seasonal power demand scenarios and often is not possible to determine in advance. PG&E crews would perform this work as needed to comply with safety procedures, limit customer outages, and manage the operational needs of the system.

3.5.9 CONSTRUCTION WORKFORCE AND EQUIPMENT

On a typical work day, approximately 20 construction crew members (four crews of up to five workers each) would be at project work sites; however, because of the highly variable nature of the construction activities associated with the reconductoring project, the number of construction workers on-site may range between approximately 5 to 45 crewmembers on a daily basis. The

equipment that would be used during project construction, as well as a summary of deliveries and pickups for each piece of equipment, are outlined in Attachment B: Anticipated Construction Equipment. Not all equipment or workers may be used during all stages of the activity. Additional equipment and/or workers may be identified once project design is finalized or during construction if unexpected conditions are encountered.

3.5.10 CONSTRUCTION SCHEDULE

Construction activities, including tower modifications and tubular steel pole installation, reconductoring, and tower reinforcements, are expected to be conducted over approximately 16 to 24 months, beginning in summer 2015. The overall construction schedule may vary depending on numerous factors including permit or land acquisition; funding for the project; the availability of appropriate crewpersons or technical staff to perform the work; and weather/land conditions.

Construction typically would occur 6 days per week (Monday through Saturday) throughout the duration of construction, but may require work on Sundays. Work would be conducted approximately 10.5 hours per day, typically occurring between 7:00 a.m. and 5:30 p.m. During the summer months, longer work days may occur. Occasionally, nighttime work may be required. Activities that may require night work include, but would not be limited to, guard structure installation across highways and other major roads, cable pulling, crew mobilization and demobilization, and construction equipment staging. Because of operational considerations of the line, work is expected to occur throughout the year with no seasonal shutdowns planned.

3.6 OPERATION AND MAINTENANCE

No changes to existing operation and maintenance activities are anticipated. Reconductoring of the transmission lines would improve reliability, thereby resulting in less wire breakage from corrosion and brittleness. Less breakage is anticipated to result in fewer events or incidents that may require emergency responses and inspections.

The existing transmission lines are inspected yearly, or as needed when driven by an event or incident, such as an emergency. A detailed ground inspection is required every other year, with a subsequent aerial patrol in between those years. The routine annual inspection, detailed ground inspection, and aerial patrol are not expected to change from methods typically used (i.e., off-road utility vehicles such as 6x6 Polaris RZR utility vehicles, line trucks, and bucket trucks, and walking to towers that are inaccessible by vehicle). Any existing access roads that are reestablished during the reconductoring project are expected to be used in future inspections. As maintenance needs arise, repairs and preventative maintenance would be fulfilled by a PG&E transmission line crew (typically five trained employees).

3.7 ANTICIPATED PERMITS AND APPROVALS

Various permits and approvals would be necessary for project implementation. Table 3-3: Required Permits and Approvals lists the permits and approvals required for the project.

Table 3-3: Required Permits and Approvals

Jurisdiction	Agency	Permit/Approval
Federal	U.S. Fish and Wildlife Service (USFWS)	Section 7 Consultation
	FAA	Notification of Proposed Construction or Alteration
	U.S. Army Corps of Engineers (USACE)	Section 404 Nationwide Permit 12
State	California Public Utilities Commission (CPUC)	Notice of Construction
	State Water Resources Control Board (State Water Board)	Section 401 Water Quality Certification, Section 402 National Pollutant Discharge Elimination System (NPDES)
	California Department of Fish and Wildlife (CDFW)	Section 1602 Streambed Alteration Agreement
	State Historic Preservation Officer	Section 106 Consultation
Local	Solano, Napa, and Solano counties; cities of Vacaville and Napa	Encroachment Permits, Demolition Permits

3.8 APPLICANT-PROPOSED MEASURES

Section 21080(C)(2) of the California Public Resources Code provides for the adoption of a mitigated negative declaration when:

- revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration and initial study are released for public review will avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment will occur, and

- there is no substantial evidence, in light of the whole record before the lead agency, that the project, as revised, may have a significant effect on the environment.

In keeping with Section 21080(C)(2) of the California Public Resources Code, PG&E has adopted the APMs provided in Table 3-4: Applicant-Proposed Measures as part of the project. These measures are incorporated into the reconductoring project and would be implemented along with the project elements described previously in this document. With incorporation of these APMs, project impacts from construction and operation of this project would be less than significant. To the extent any of the following measures conflict with requirements in subsequently issued resource agency permits, the resource agency permit requirements would supersede these measures.

Table 3-4: Applicant-Proposed Measures

Title	Description
General	
APM-GEN-1: Develop and Implement a Worker Environmental Training Program	A worker environmental training program that is specific to the project will be developed. Each construction and on-site worker will attend the environmental training before starting on-site work. Training will include avoidance and minimization measures that are being implemented to protect biological resources, hydrologic resources, cultural resources, and air quality, as well as manage hazardous materials. The training will also discuss the terms and conditions of any permits or agreements, information on the federal and state Endangered Species Acts, and the consequences of noncompliance with these permits, agreements, and acts. Workers will be informed about the presence, identification, life history, and habitat requirements of the special-status species that have a potential to occur in the project area. Training will include recognizing and avoiding exclusion areas and sensitive habitat and specific avoidance or minimization measures for sensitive species and habitats. Training also will include information on state and federal laws protecting nesting birds, wetlands, and other water resources. Focused trainings may be directed at an individual's job-specific task, provided that the worker conducts activities within a limited scope (pilots, delivery drivers, site visitors, etc.). The Environmental Inspector will have discretion as to which level of training a worker receives and whether they are required to have an escort (i.e., another person who has received the full environmental training). All trainees will sign a training sign-in sheet, verifying participation. The environmental training will include avoidance requirements and procedures to be followed if unanticipated cultural resources are discovered during project-related activities, as well as a discussion regarding disciplinary and other actions that may occur when historic preservation laws and PG&E policies are violated. All project workers involved with ground-disturbing activities will receive a pamphlet describing how to identify cultural resources and what to do if an unanticipated discovery is made during construction.
Aesthetics	
APM-AE-1: Temporary Nighttime Construction Lighting	Temporary lighting required for nighttime construction will be focused on work areas and directed on site to minimize potential effects on nearby sensitive receptors.
Agricultural Resources	
APM-AG-1: Agriculture Impacts Avoidance and Compensation	If crops (i.e., grape vines, orchards) are removed or damaged to accommodate construction activities, PG&E will provide compensation to landowners for temporary crop loss associated costs. Per landowner request, PG&E will restore existing agricultural fields to preconstruction conditions or compensate the landowner to restore fields to preconstruction conditions so crops can be replanted.
Air Quality and Greenhouse Gas Emissions	
APM-AQ-1: Minimize Vehicle/Equipment Emissions	PG&E will minimize vehicle emissions during construction by implementing the following measures: • Minimize idling times by shutting equipment off when not in use and by reducing the maximum idling time, as required by applicable California Regulations. • Maintain and properly tune construction equipment in accordance with manufacturer's specifications. • Options for reducing the emissions of off-road equipment (more than 50 horsepower) will include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as they become available.

Table 3-4: Applicant-Proposed Measures

Title	Description
APM-AQ-2: Minimize Fugitive Dust	PG&E will minimize fugitive dust during construction by implementing the following measures in accordance with the SWPPP: • Visible dust emissions generated by the project will not exceed 20 percent opacity during the time when soil is disturbed. • Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered or covered, as needed, to reduce fugitive dust. • Haul trucks transporting soil, sand, or other loose material off site will be covered or will be required to maintain at least 1 foot of freeboard. • Visible mud or dirt track-out onto adjacent paved roads will be removed from active work areas at the end of each work day. • Vehicle speeds on unpaved roads with no posted speed limit and rights-of-way will be limited to 15 miles per hour • A publicly visible sign with the name and telephone number of the lead agency contact for dust complaints will be posted. The air district's phone number also will be visible on the sign. PG&E may also temporarily apply gravel or other substrates to control fugitive dust at landing zones or other work areas, as necessary.
Biological Resources	
APM-BIO-1:	a. Approval of Biological Monitors: At least 30 days before starting construction activities PG&E shall submit to CDFW in writing the names and qualifications of biologists (Designated Biologists) assigned to this project. PG&E shall obtain CDFW approval of any Designated Biologists in writing before starting construction activities, and shall also obtain approval in advance in writing if any Designated Biologists are changed or added. PG&E shall ensure that the Designated Biologists are knowledgeable and experienced in the biology and natural history of animal and plant that may be present at the project area. The Designated Biologists shall be responsible for monitoring construction activities to minimize and avoid take of biota and to minimize disturbance of habitats. Lead Biologist. One Designated Biologist shall be appointed Lead Biologist and that individual shall be responsible for oversight of the Designated Biologists, coordination of biological issues with all parties working on the project, record keeping, reports and monitoring site compliance with the terms of this Agreement. In some instances, approval of Designated Biologists by CDFW may require that they work under the supervision of the Lead Biologist Quantity of Designated Biologists On-Site. The PG&E shall have a sufficient number of Designated Biologists on-site to ensure all phases of construction activities are monitored to minimize and avoid project impacts as required in the applicant proposed measures and applicable federal and state permits. b. Assign a Biological Monitor to be On Site during Construction Activities: A biological monitor will monitor construction activities that have the potential to affect special-status species or other sensitive resources. The monitors(s) will ensure implementation and compliance with the resource-specific avoidance and minimization measures. Each monitor will have the authority to temporarily halt or redirect work or determine alternative work practices with construction workers, as appropriate, if construction activities are likely to impact sensitive biological resources.

Table 3-4: Applicant-Proposed Measures

Title	Description
	If a special-status wildlife species is encountered during construction, project activities will cease in the area where the species is found until the biologist, with prior authorization from USFWS and/or CDFW, in accordance with the species state or federal listing, relocates the species out of harm's way and/or takes other appropriate steps previously authorized by USFWS and/or CDFW to protect the wildlife. Work may resume once the biological monitor has determined that construction activities will not harm the wildlife. No pursuit, capture or harm to state fully protected species will be allowed; state fully protected species will be allowed to leave project areas under their own volition.
APM-BIO-2: Restrict Work Area and Access Routes	Vehicles will be confined to established roadways and pull-outs, and pre-approved access roads, overland routes, turn-outs, project work areas, PG&E-owned facilities, and access areas.
APM-BIO-3: Maintain Equipment and Follow Refueling Directives	All equipment will be maintained to avoid leaks of automotive fluids, such as fuels, solvents, or oils. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents shall be located more than 100 feet from stream channel and banks. All equipment and fuel stored on-site shall be bermed to contain any spilled material and shall be protected from rain. Berms shall consist of plastic covered dirt or sand bags.
APM-BIO-4: Avoid Impacts on Special-Status Plant Populations	Special-status plant populations previously identified during the field surveys within or adjacent to project work areas will be surveyed prior to construction, as necessary, to determine the extent of the current populations. All locations currently supporting or previously observed in all planning and preconstruction botanical surveys to support special-status plant populations will be flagged. During these surveys, special-status plant populations as described above that have the potential to be impacted will be mapped and flagged and/or identified with signage for avoidance. Surveys will be conducted during the appropriate blooming period for each special-status plant species previously identified within the project area and maps will be updated to reflect any plant species detected. If work must occur before the next blooming season and ground disturbance must occur in previously known special-status plant areas, then those areas will be treated as if the plant is present (i.e., topsoil segregation). Should grading work be required within occupied habitat, up to the top 6 inches or other feasible amount will be stored separately on site, protected from exotic weeds, and replaced following completion of the project. Provisions for disturbed populations will be addressed in the Mitigation and Restoration Plan. The Mitigation and Restoration Plan will address how water conservation will be practiced in the event drought conditions persist.
APM-BIO-5: Conduct Pre-Construction Surveys and Establish Work Exclusion Areas	a. Burrowing species: A biologist will conduct pre-construction surveys no more than 2 weeks before the start of construction activities at scheduled work locations. During these surveys, the biologist will note any potential burrowing owl or American badger burrows within 250 feet of the project. The biologist will confirm or readjust the boundaries of specific temporary work areas based on any sensitive resources that are present, and will determine if additional targeted resource surveys are needed to verify the status of burrowing owl, American badger, or other special-status species that have the potential to occur within the project area. b. Foothill yellow-legged frog (FYLF): Immediately prior to the start of any work within 50 feet of suitable habitat, the on-site biologist will conduct a visual survey of the work area for the presence of FYLF. If a FYLF is found within the work area, it will be relocated, if necessary, by the Biological Monitor to nearby suitable habitat outside of the active work area. Any relocations will be reported to CDFW. c. Western pond turtle: Immediately prior to the start of any work within 50 feet of suitable

Table 3-4: Applicant-Proposed Measures

Title	Description
	habitat, the on-site biologist will conduct a visual survey of the work area for the presence of western pond turtle. If a western pond turtle is found within the work area, it will be relocated, if necessary, by the Biological Monitor to nearby suitable habitat outside of the active work area. Any relocations will be reported to CDFW. d. California red-legged frog (CRLF): Immediately prior to the start of activities in suitable CRLF habitat—from Tower Work Area 98 to Tower Work Area 109 in Napa County and from Tower Work Area 157 to Lakeville Substation—a USFWS-approved biologist will conduct a daily pre-construction survey for CRLF. During the wet season (November 1 to April 14), the pre-construction survey within these areas will include all locations where work will occur that day. During the dry season, the survey area will be limited to work locations within 300 feet of suitable aquatic habitat for CRLF. Wet season windows for surveys may be advanced or set back by up to 30 days depending on actual precipitation event occurrences (greater than 0.5 inches within a 24-hour window) during season of construction if authorized by CDFW and SWRCB.
APM-BIO-6: Avoid Impacts on Wetlands and Streams	Prior to the initiation of construction in areas containing or adjacent to streams or wetlands, the work areas will be surveyed by a biologist and flagged for avoidance. Exclusionary buffers will be established around wetlands and streams, as necessary. Wetlands and streams will be avoided to the maximum extent feasible. In the event that avoidance is not feasible and if work should occur in wetlands and streams, PG&E will implement BMPs including, but not limited to: temporarily placing wooden, fiber, or metal mats or portable bridges at stream and wetland crossings to minimize downstream sedimentation, rutting of soils, and ground disturbance. PG&E will also prepare a Land Form and Grading Plan, to be approved by the SWRCB, which will outline guidelines for access road and site disturbance to minimize run-off and erosion. PG&E will also restore impacted wetlands and streams to pre-construction conditions, as described in APM BIO-15.
APM-BIO-7: Avoid Impacts on Valley Elderberry Longhorn Beetle	In accordance with PG&E's existing Programmatic Biological Opinion, all elderberry plants with a stem diameter greater than 1 inch that have been identified during pre-construction surveys in the project area, within the range of valley elderberry longhorn beetle (VELB), will be mapped before the start of construction; any elderberry bushes within 20 feet of planned work activities will be flagged for avoidance (PG&E VELB Environmental Compliance Program 2007). Should impacts on elderberry bushes be unavoidable, the impacts will be documented in accordance with the Programmatic Biological Opinion.
APM-BIO-8: Avoid Wildlife Entrapment	Temporary excavations, including but not limited to pole excavations for crossing structures, that may act as pitfall traps (i.e., those exceeding 6 inches in depth) will be securely covered at the end of each work day or escape ramps will be provided at linear intervals not exceeding 10 feet. Existing pole excavations will be inspected before they are filled to verify the absence of wildlife. If wildlife becomes entrapped in an excavation, work will be halted, the biological monitor will be contacted, and the species will be rescued. The incident will be reported to the appropriate agencies in compliance with project authorizations.
APM-BIO-9: Allow Only Specified Erosion Control Materials	To avoid impacting special-status reptile and amphibian species—including California red-legged frog, foothill yellow-legged frog, and western pond turtle—only tightly woven netting or similar material, such as natural fiber rolls and geotextiles, will be used for erosion control within or adjacent to suitable habitat. No plastic monofilament netting will be used in these areas.

Table 3-4: Applicant-Proposed Measures

Title	Description
APM-BIO-10: Avoid Impacts on Nesting Birds	If work is scheduled to occur during the avian nesting season (March 1 through August 31), nest detection surveys will be conducted no more than 15 days prior to initial work activities at designated construction areas and towers to determine nesting status in the area. Nest surveys will be accomplished by ground surveys and/or by helicopter and will support phased construction, with surveys scheduled to be repeated if construction lapses in a work area for 30 days between March and July. Nest surveys will follow standard biological survey methods, and survey efforts will be tailored by project location, with visits planned at appropriate timeframes/intervals to detect nesting activity. In addition, biologists monitoring construction will conduct nest surveys and/or nest monitoring in areas adjacent to ongoing construction. If nests are found, the project biologist will establish an appropriate buffer to be in compliance with the Migratory Bird Treaty Act (MBTA) and Fish and Game Code 3503. PG&E will apply standardized species-specific no activity buffers developed as part of PG&E's avian management plan. Nest building activities will be periodically monitored, recorded and assessed for protection measures. Active nests (defined as the presence of chicks and/or eggs) will be monitored and exclusion buffer sizes increased if the monitoring biologist determines this is necessary based on disturbance behavior exhibited by nesting birds in proximity to project construction. Nesting pair acclimation to disturbance in areas with regularly occurring human activities will be considered when establishing no activity nest buffers. Per the discretion of the biological monitor, vegetation removal by hand may be allowed within nest buffers or in areas of potential nesting activity. These activities shall be closely monitored to ensure that active nests are not disturbed. Abnormal nesting behaviors include, but are not limited to, defensive flights/vocalizations directed towards project personnel, standing up from a brooding position, and flying away from the nest. The biological monitor will have authority to order the cessation of all nearby project activities if the nesting birds exhibit abnormal behavior which may cause reproductive failure (nest abandonment and loss of eggs and/or young) until an appropriate buffer is established. To prevent encroachment, the established buffer(s) will be clearly marked for avoidance. The established buffer(s) will remain in effect until the young have fledged or the nest is no longer active as confirmed by the biological monitor. Helicopter restrictions will include observance of appropriate established buffers and avoidance of hovering in the vicinity of active nest sites. Helicopter flight restrictions may be in effect for densely populated residential areas, and nest surveys by ground in populated areas, such as in backyards, will be subject to property access permissions.
APM-BIO-11: Avoid Impacts on Burrowing Owl	No project-related disturbance will occur within buffers established in accordance with APM-BIO-10 of occupied burrowing owl burrows during the non-breeding season (September 1 through January 31), with appropriate adjustments during the breeding season (February 1 through August 31). The limits of the exclusion zone in the project area will be marked with staking, posts, or flagging. If construction activities must occur within these limits while burrows are active, a site-specific work plan, including onsite monitors, will be prepared and work will take place only in the presence of biological monitor. Compliance with the MBTA and Fish and Game Code 3503 shall be maintained.
APM-BIO-12: Avoid Impacts on Eagle and Swainson's Hawk Nests	If work is conducted during the nesting season, a pre-construction survey to assess the status of known golden eagle, bald eagle, and Swainson's hawk nest sites in the project area will be conducted by a biologist before the start of construction. These surveys will be conducted at appropriate seasonal times and/or will be repeated as necessary to identify active nests throughout the nesting season. A 0.5-mile exclusionary buffer will be implemented around active eagle or Swainson's hawk nest sites. The buffers around active Swainson's hawk nests may be reduced to 0.25 mile if observations by the biological monitor determine that project activities will not disturb nesting activities. This

Table 3-4: Applicant-Proposed Measures

Title	Description
	determination will be made based on nest location, tolerance of human disturbances, topography, vegetative screening, and the work activities planned. If the 0.25-mile buffer needs to be breached, prior to the break, CDFW and/or USFWS will be consulted.
APM-BIO-13: Avoid Impacts on Roosting Bats	A survey for special-status bats, including western red bat and pallid bat, will be conducted at appropriate timeframes to detect bats prior to the removal of potential special-status bat roosting habitat, which includes, but is not limited to, the removal or trimming of large trees, snags, or riparian trees, or the presence of structures that could support bats, as identified by a biologist. The survey will include the work location and an area up to 200 feet around the work areas in suitable habitat. If an active roost is detected, a 100 foot buffer will be established around the roost and a qualified biologist will periodically monitor the site. If this avoidance strategy is not practicable, an alternative plan will be developed in consultation with CDFW. Any planned tree removal in suitable habitat will be assessed for the presence of western red bats and the following procedures will be followed. To the maximum extent feasible, tree removal or trimming activities will only occur between September and April (not during the maternity season – May through August). In suitable habitat, any trees, snags, or stumps planned for removal or significant trimming will be removed on warm days between late morning and early afternoon when any bats present are likely to be warm. Noise and vibration disturbance will be created on the tree, and potential crevices and cavities will be carefully opened and inspected by a qualified biologist for the presence of bats. If bats are suspected within trunk or limb tree cavities, attempts will be made to expose any bats to allow escape, by successively cutting sections above the cavity to open it, and pausing 10 minutes between cuts to inspect and determine if bats are present. If bats may occur in branches that can be removed from the tree intact and set aside, the removed branches will be carefully removed and set upright to allow bats to passively escape.
APM-BIO-13: Avoid Impacts on Roosting Bats (continued)	Active maternity colonies of western red bats are not anticipated in the project area given the known maternity range for this species, but should a bat nursery occur, disturbance will be avoided by establishment of appropriate buffers (approximately 100 to 200 feet) until it is determined that breeding is complete and the young are mature and flight-capable.
APM-BIO-14: Avoid and Minimize Impacts on Critical Habitat and Sensitive Natural Communities	If construction work will be conducted within USFWS-designated critical habitat or near sensitive natural communities—including brackish marsh, wetlands, streams, vernal pools, and native grasslands—the boundaries of the work area adjacent to sensitive vegetation areas will be delineated with visible flagging or fencing, or otherwise marked by a biologist as exclusion zones, prior to the start of construction in those areas. The flagging, fencing, and/or other marking will be maintained in place for the duration of construction at each location. Should work be necessary within sensitive natural communities, measures—including cleaning construction equipment of dirt and vegetation before entry and requiring that only weed-free materials be utilized—will be implemented to avoid the introduction of noxious weeds. Only project personnel entering by foot will be allowed within vernal pool habitat.
APM-BIO-15: Restore Sites Disturbed by Construction	Before construction begins, a Mitigation and Restoration Plan will be prepared by a restoration ecologist and submitted to the State Water Board and CDFW for approval. This process will be augmented by measures to protect fish and wildlife resources that are generated within specific Lake and Streambed Alteration Agreements with CDFW. The Restoration Plan will include post-construction plans for restoring construction work areas to preconstruction conditions through recontouring, erosion control, removal of construction debris, and decompacting soil. The Restoration Plan will also provide seasonal and/or weather constraints associated with driving through dry stream crossings. Restoration work

Table 3-4: Applicant-Proposed Measures

Title	Description
	may also include such activities as replanting or reseeding of native species, or using a seed mix that is consistent with agricultural/ranching operations and complements nearby habitat type(s) or agricultural conditions. The Mitigation and Restoration Plan will also specify requirements to document the existing conditions of work areas and overland travel routes prior to construction, including pre-construction photo documentation, which will be conducted by a biologist. Specifically, wetlands and streams impacted by crossing improvements or used during construction will be photodocumented prior to construction. Once restoration work is completed, a biologist will conduct post-construction photo documentation of the crossing location sites to ensure they have returned to approximate pre-construction conditions.
APM-BIO-16: California Red-Legged Frog Exclusion Fencing	If major ground-disturbing work will occur within suitable CRLF habitat—from Tower Work Area 98 to Tower Work Area 109 in Napa County and from Tower Work Area 157 to Lakeville Substation—during the wet season (defined as November 1 to April 14), exclusion fencing may be installed around the perimeter of work areas to exclude CRLF from these areas. The fencing, which can be made of wood, geotextile fabric, or other durable material, will be a minimum of 3 feet in height and will be buried at least 4 inches underground. Gates will be installed to allow vehicles to enter from access roads. These gates will be kept closed (to the extent practicable) during construction, and will be closed at the end of each work day. Exit funnels may be installed, where appropriate, to allow small vertebrates to leave the work area unharmed. The exclusion fencing will remain in place for the duration of construction activities—if located within 300 feet of suitable aquatic habitat for CRLF—or for the duration of the wet season only if no suitable aquatic habitat is present. A biological monitor will regularly check that the fence is functioning properly and will check for the presence of sensitive species. A biological monitor will check the fences daily during any rain events of 0.25 inch or greater and within 48 hours after a rain event of 0.25 inch or greater, on days where construction is occurring at the fenced work area.
APM-BIO-17: Minimize Impacts to Steelhead	Work within stream channels upstream of areas where steelhead may be present will be conducted during the dry season when water is absent. These areas include tributaries to Encinosa Creek, tributaries to Ulatis Creek, Laguna Creek and its tributaries, tributaries to Green Valley Creek, tributaries to Dug Road Creek, and tributaries to the Petaluma River. Rock fill or riprap used for culverts or plating will consist of appropriate masonry material that is free of debris or pollutants. PG&E will develop and implement site-specific BMPs as part of the SWPPP to prevent erosion and sedimentation during construction. The size, quantity, and placement of rock fill will be appropriate to maintain normal stream flows, prevent scouring and erosion, and avoid impeding the passage of aquatic organisms.
APM-BIO-18: Nighttime Lighting	Temporary lighting required for nighttime construction will be directed away from known nest locations, bat roosts, and other sensitive biological resources. The minimum amount of lighting necessary for nighttime construction will be used. Nest locations and other sensitive biological resources will be flagged in the field and a biologist will provide a tailboard training describing the locations to crewpersons near the work site before lighting is installed. CDFW approval will be necessary for instances when PG&E needs to operate heavy equipment after 11:00 PM for more than three consecutive nights or more than five nights a month.
APM-BIO-19: Compensatory Mitigation Approval	Prior to initiation of construction, PG&E will provide a compensatory mitigation strategy in a Restoration and Mitigation Plan to CDFW and SWRCB for approval to offset temporary and permanent impacts to sensitive species habitat, aquatic resources and riparian habitat, and sensitive natural communities. Compensatory mitigation may include purchase of

Table 3-4: Applicant-Proposed Measures

Title	Description
	mitigation credits at a state or federal approved mitigation bank, in lieu fee program, or onsite/ offsite restoration that improves ecological features of the impacted resource. PG&E will not begin construction until written approval is received from CDFW and SWRCB for this plan.
Cultural and Paleontological Resources	
APM-CU-1: Archaeological Site Avoidance	Archaeological sites and isolates are within the reconductoring project area. To avoid inadvertent damage to these sites during project implementation, work area limits adjacent to known sites will be clearly marked with visible flagging tape, and construction crews will be instructed that no vehicle access, travel, equipment staging and storage, or other construction-related activities are allowed outside designated work areas.
APM-CU-2: Management of Unanticipated Discoveries	Construction activities may inadvertently uncover previously unrecorded cultural resources. If cultural resources are inadvertently discovered during construction activities, all activities will be halted within 100 feet of the discovery and a PG&E cultural resources specialist will be contacted to assess its significance.
APM-CU-3: Treatment of Paleontological Discoveries	If fossil remains are uncovered during project construction, all work within 50 feet of the discovery will be halted, and the construction crew will immediately notify PG&E. PG&E will contact a paleontologist who will evaluate the resource and will prepare a treatment plan in accordance with Society of Vertebrate Paleontology Guidelines (1996). Components of the treatment plan related to "unique" fossil specimens that are encountered during construction may include a field survey, additional construction monitoring, specific sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings.
APM-CU-4: Treatment of Human Remains	If any human remains are inadvertently discovered during construction activities, all activities will be halted within 100 of the discovery and a PG&E cultural resources specialist will be contacted to conduct an assessment. The PG&E cultural resources specialist will contact the county coroner, if necessary, following the California Health and Safety Code, Section 7050.5. If the human remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, who will notify and appoint a Most Likely Descendent (MLD). PG&E and the MLD will determine how to treat human remains. No work may proceed within 100 feet of the site until treatment of the remains is complete or permission from the PG&E cultural resources specialist has been received.
Hazards and Hazardous Materials	
APM-HAZ-1: Hazardous Materials Management	To minimize the potential for release of hazardous materials and risk of upset, PG&E will adhere to the measures detailed in the SWPPP for storage, refueling, and maintenance of helicopters, construction vehicles, and construction equipment during project implementation. PG&E will review these measures with on-site personnel at the start of the project, and when any new personnel are brought onto the project. The briefing will cover the availability of spill kits, procedures for reporting, and cleanup procedures for the release of hazardous materials, and protocols for handling hazardous materials on site. PG&E will meet all California Division of Occupational Safety and Health (Cal/OSHA) workplace safety standards to ensure worker safety in the handling and use of hazardous materials. These measures will be included in the Worker Environmental Training Program.
APM-HAZ-2: Fire Risk Management	PG&E will implement standard fire prevention procedures, such as keeping appropriate firefighting equipment on site; ensuring consistent access to firefighting equipment; maintaining firefighting equipment in operating condition; ensuring access to a temporary or permanent water supply; locating internal, combustible, engine-powered equipment away

Table 3-4: Applicant-Proposed Measures

Title	Description
	from combustible materials, and no smoking will be allowed in project work areas.
Hydrology, Water Quality, and Beneficial Uses of Waters of the State	
APM-HYDRO-1: Stormwater Pollution Prevention Plan	PG&E will file a notice of intent with the State Water Board for coverage under the General Construction Storm Water Permit and will prepare and implement a SWPPP in accordance with General Order No. 2009-0009-DWQ. Implementation of the SWPPP will help stabilize disturbed areas and reduce erosion and sedimentation. The following measures are generally included in the SWPPP and are consistent with PG&E's standard practices. • Erosion control devices (ECDs) will be developed to prevent the acceleration of natural erosion and sedimentation rates. A monitoring program will be established to ensure that the prescribed BMPs are followed throughout project construction. Examples of BMPs include, but are not limited to, the following measures: • ECDs will be on site and ready for installation before the start of construction activities; • All ECDs will be inspected before and after each qualifying storm event, as defined by the State Water Board. ECDs will be maintained regularly and replaced as necessary throughout the course of construction. • A qualified SWPPP practitioner (QSP) will oversee the implementation of the SWPPP and ECDs.
APM-HYDRO-2: Minimize Ground Disturbance	Ground-disturbing activities, such as grading, blading, and cut and fill activities, will be minimized to the greatest extent feasible. However, if g ground-disturbing activities are required, they will be limited to the dry season to the greatest extent feasible and measures from the SWPPP will be implemented at all affected locations. Decompaction testing will be conducted, as needed, and post-construction restoration will be implemented, as described in APM-BIO-15.
APM-HYDRO-3: Dewatering	Although excavation activities associated with the project are limited, in the unlikely event that groundwater is encountered, it will be pumped into a baker tank and discharged at an appropriate wastewater facility. Groundwater may also be used to control fugitive dust on site, as needed, and may be dispersed to other vegetated areas, on the condition that the reused groundwater does not result in ponding or flow into areas outside of the proposed construction footprint.
Noise	
APM-NO-1: Noise Minimization with Portable Barriers	Compressors and other small stationary equipment used during construction will be shielded with portable barriers if the equipment is located near noise-sensitive receptors.
APM-NO-2: Maintain Noise Level Thresholds	While PG&E is not subject to local noise ordinances for project construction, PG&E will make reasonable efforts to maintain noise levels within local jurisdictional standards, which may include implementing alternative construction techniques when feasible, notifying residents in advance of certain construction activities, altering construction hours, or offering residents temporary accommodations during construction activities where noise thresholds are exceeded within the proximity of those residents.
APM-NO-3: Maintain Minimum Distance from Residential Structures	Helicopters will maintain a safe height in accordance with FAA regulations when passing over residential areas, with the exception of when helicopters are at temporary construction areas or actively assisting with the stringing of conductor or other project activities.

Table 3-4: Applicant-Proposed Measures

Title	Description
Recreation	
APM-REC-1: Maintain Safe Recreational Access	Where construction will result in temporary closures of parks, open space, or trails, PG&E will provide temporary detours or direct public users to safe areas along the construction zone.
Transportation and Traffic	
APM-TRA-1: Air Transit Coordination	PG&E will follow the following protocols that pertain to air traffic: • PG&E will comply with all FAA regulations regarding air traffic within 2 miles from the project alignment and will implement safety measures required by the FAA in response to PG&E's Notices of Proposed Construction or Alteration. • PG&E will coordinate all project helicopter operations with the local airports and the FAA before and during project construction. • Residents may be required to temporarily vacate their homes or businesses. If this is necessary, PG&E will coordinate with potentially affected residents or businesses to minimize the duration of the necessary work and any inconvenience.

3.9 ELECTRIC AND MAGNETIC FIELDS SUMMARY

This section describes electric magnetic fields (EMFs), information regarding its effects on human health, State Water Board findings on EMFs, and the measures included in this project to minimize EMF exposure. EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). Power frequency EMF is a natural consequence of electrical circuits, and can be either directly measured using the appropriate measuring instruments or calculated using appropriate information.

Based on the information in the record, the State Water Board makes the following findings on EMFs:

Consistent with CEQA Guidelines Section 15145, the lead agency finds that the impact of EMF is too speculative for evaluation because there is no conclusive scientific information and, therefore no substantial evidence on the record, that there is a link between exposure to EMFs and human health impacts. Therefore, this IS/MND provides no further discussion of the effects of EMFs beyond the review provided in this section.

As discussed below, CPUC has developed requirements that utilities must consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities. PG&E was directed to develop, submit, and follow EMF guidelines to implement the CPUC decision for this project. These measures are described below.

3.9.1 ELECTRIC FIELDS

Electric fields are present whenever voltage exists on a wire, and are not dependent on current. The magnitude of the electric field is primarily a function of the configuration and operating voltage of the line and decreases with the distance from the source (line). The electric field can

be shielded (i.e., the strength can be reduced) by any conducting surface, such as trees, fences, walls, buildings, and most types of structures. The strength of an electric field is measured in volts per meter (V/m) or kilovolts per meter (kV/m).

3.9.2 MAGNETIC FIELDS

Magnetic fields are present whenever current flows in a conductor, and are not dependent on the voltage present on the conductor. The strength of these fields also decreases with distance from the source. However, unlike electric fields, most common materials have little shielding effect on magnetic fields.

The magnetic field strength is a function of both the current on the conductor and the design of the system. Magnetic fields are measured in units called Gauss.[6] However, for the low levels normally encountered near power systems, the field strength is expressed in a much smaller unit, the milligauss (mG), which is one- thousandth of a Gauss.

Power frequency EMF is present where electricity is used. This includes not only utility transmission lines, distribution lines, and substations, but also the building wiring in homes, offices, and schools, and in the appliances and machinery used in these locations. Typical magnetic fields from these sources can range from below 1 mG to above 1,000 mG (i.e., 1 Gauss).

Magnetic field strengths diminish with distance. Fields from compact sources (i.e., those containing coils, such as small appliances and transformers) decrease in inverse proportion to the distance from the source cubed. For three-phase power lines with balanced currents, the magnetic field strength drops off inversely proportional to the distance from the line squared. Fields from unbalanced currents that flow in paths, such as neutral or ground conductors, fall off inversely proportional to the distance from the source. Conductor spacing and configuration also affect the rate at which the magnetic field strength decreases.

The magnetic field levels of PG&E's overhead and underground transmission lines would vary depending upon customer power usage. Magnetic field strengths for typical PG&E transmission line loadings at the edge of the ROW are approximately 10 to 90 mG. Under peak load conditions, the magnetic fields at the edge of the ROW would not likely exceed 150 mG. There are no long-term, health-based federal or state government EMF exposure standards. State regulations for magnetic fields have been developed in New York and Florida (150 mG and 200 mG, respectively, at the edge of the ROW). However, these are based on limiting exposure from new facilities to levels no greater than existing facilities.

The strongest magnetic fields around the outside of a substation come from the power lines entering and leaving the station. The strength of the magnetic fields from transformers and other equipment decreases quickly with distance. Beyond the substation fence, the magnetic fields produced by the equipment within the station are typically indistinguishable from background levels.

[6] Magnetic fields can also be measured in units called Tesla (T). 1 Gauss = 1 x 10^{-4} T.

3.9.3 POSSIBLE HEALTH EFFECTS

The possible effects of EMF on human health have come under scientific scrutiny. Concern about EMF originally focused on electric fields; however, much of the recent research has focused on magnetic fields. Uncertainty exists as to what characteristics of magnetic field exposure need to be considered to assess human exposure effects. Among the characteristics considered are field intensity, transients, harmonics, and changes in intensity over time. These characteristics may vary from power lines to appliances to home wiring, and this may create different types of exposures. The exposure most often considered is intensity or magnitude of the field.

There is a consensus among the medical and scientific communities that there is insufficient evidence to conclude that EMF causes adverse health effects. Neither the medical nor scientific communities have been able to provide any foundation upon which regulatory bodies could establish a standard or level of exposure that is known to be either safe or harmful. Laboratory experiments have shown that magnetic fields can cause biologic changes in living cells, but scientists are not sure whether any risk to human health can be associated with them. Some studies have suggested an association between surrogate measures of magnetic fields and certain cancers, although others have not.

3.9.4 REVIEWS OF EMF STUDIES

Hundreds of EMF studies have been conducted over the last 20 years in the areas of epidemiology, animal research, cellular studies, and exposure assessment. A number of nationally recognized multi-discipline panels have performed comprehensive reviews of the body of scientific knowledge on EMF. These panels' ability to bring experts from a variety of disciplines together to review the research gives their reports recognized credibility. It is standard practice in risk assessment and policymaking to rely on the findings and consensus opinions of these distinguished panels. None of these groups have concluded that EMF causes adverse health effects or that the development of standards were appropriate or would have a scientific basis.

Reports by the National Institute of Environmental Health Sciences (NIEHS), National Research Council/National Academy of Sciences, World Health Organization (WHO), International Agency for Research on Cancer (IARC), American Cancer Society (ACS), and American Medical Association (AMA) conclude that insufficient scientific evidence exists to warrant the adoption of specific health-based EMF mitigation measures. The potential for adverse health effects associated with EMF exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

3.9.4.1 National Institute of Environmental Health Sciences

In June of 1999, the federal government completed a $60-million EMF research program managed by the NIEHS and the U.S. Department of Energy (DOE). Known as the EMF RAPID (Research and Public Information Dissemination) Program. In their report to the U.S. Congress, the NIEHS concluded that:

> The NIEHS believes that the probability that ELF [extremely low frequency] EMF exposure is truly a health hazard is currently small. The weak epidemiological

> associations and lack of any laboratory support for these associations provide only marginal, scientific support that exposure to this agent is causing any degree of harm.

The NIEHS report also included the following conclusions:

> The National Toxicology Program routinely examines environmental exposures to determine the degree to which they constitute a human cancer risk and produces the 'Report on Carcinogens' listing agents that are 'known human carcinogens' or 'reasonably anticipated to be human carcinogens.' It is our opinion that based on evidence to date, ELF EMF exposure would not be listed in the 'Report on Carcinogens' as an agent 'reasonably anticipated to be a human carcinogen.' This is based on the limited epidemiological evidence and the findings from the EMF RAPID Program that did not indicate an effect of ELF EMF exposure in experimental animals or a mechanistic basis for carcinogenicity.
>
> The NIEHS agrees that the associations reported for childhood leukemia and adult chronic lymphocytic leukemia cannot be dismissed easily as random or negative findings. The lack of positive findings in animals or in mechanistic studies weakens the belief that this association is actually due to ELF EMF, but cannot completely discount the finding. The NIEHS also agrees with the conclusion that no other cancers or non-cancer health outcomes provide sufficient evidence of a risk to warrant concern.
>
> Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF EMF, but it cannot completely discount the epidemiological findings.
>
> The NIEHS suggests that the level and strength of evidence supporting ELF EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. We also encourage technologies that lower exposures from neighborhood distribution lines provided that they do not increase other risks, such as those from accidental electrocution or fire.

3.9.4.2 U.S. National Research Council/National Academy of Sciences

In May 1999, the National Research Council/National Academy of Sciences—an independent scientific agency responsible for advising the federal government on science, technology, and

medicine—released its evaluation of the scientific and technical content of research projects conducted under the U.S. EMF RAPID Program, concluding that:

> The results of the EMF RAPID Program do not support the contention that the use of electricity poses a major unrecognized public-health danger. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue, but a special research-funding effort is not required. Investigators should compete for funding through traditional research-funding mechanisms. If future research on this subject is funded through such mechanisms, it should be limited to tests of well-defined mechanistic hypotheses or replications of reported positive effects. If carefully performed, such experiments will have value even if their results are negative. Special efforts should be made to communicate the conclusions of this effort to the general public effectively.

The following specific recommendations were made by the committee:

- The committee recommends that no further special research program focused on possible health effects of power-frequency magnetic fields be funded. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue, but investigators should compete for funding through traditional research funding mechanisms.

- If, however, Congress determines that another time-limited, focused research program on the health effects of power-frequency magnetic fields is warranted, the committee recommends that emphasis be placed on replications of studies that have yielded scientifically promising claims of effects and that have been reported in peer-reviewed journals. Such a program would benefit from the use of a contract-funding mechanism with a requirement for complete reports and/or peer-reviewed publications at program's end.

- The engineering studies were initiated without the guidance of a clearly established biologic effect. The committee recommends that no further engineering studies be funded unless a biologic effect that can be used to plan the engineering studies has been determined.

- Much of the information from the EMF RAPID biology program has not been published in peer-reviewed journals. NIEHS should collect all future peer-reviewed information resulting from the EMF RAPID biology projects and publish a summary report of such information periodically on the NIEHS Website.

- The communication effort initiated by EMF RAPID is reasonable. The two booklets and the telephone information line are useful, as is the EMF RAPID Internet site. There are two limitations to the effort. First, it is largely passive, responding to inquiries and providing information, rather than being active. Second, much of the information produced is in a scientific format not readily understandable by the public. The committee recommends that further material produced to disseminate information on power-frequency magnetic fields be written for the general public in a clear fashion. The Web site should be made more user-friendly. The booklet Questions and Answers about EMF should be updated periodically and made available to the public.

3.9.4.3 World Health Organization

The WHO established the International EMF Project in 1996 to investigate potential health risks associated with exposure to EMF. A WHO Task Group recently concluded a review of the health implications of ELF EMF.

A Task Group of scientific experts was convened in 2005 to assess any risks to health that might exist from exposure to ELF EMF. Previously in 2002, the IARC examined the evidence regarding cancer; this Task Group reviewed evidence for a number of health effects, and updated the evidence regarding cancer. The conclusions and recommendations of the Task Group are presented in a WHO report titled "Extremely Low Frequency Fields Environmental Health Criteria Monograph No. 238" and Factsheet No. 322 and state the following:

> "New human, animal and in vitro studies, published since the 2002 IARC monograph, do not change the overall classification of ELF magnetic fields as a possible human carcinogen."
>
> "A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukaemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease."
>
> "…the epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. Thus, if there were any effects from exposures to these low-level fields, it would have to be through a biological mechanism that is as yet unknown. Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukaemia is not strong enough to be considered causal."
>
> "Policy-makers should establish an ELF EMF protection programme that includes measurements of fields from all sources to ensure that the exposure limits are not exceeded either for the general public or workers."
>
> "Government and industry should monitor science and promote research programmes to further reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure."
>
> "Policy-makers, community planners and manufacturers should implement very low-cost measures when constructing new facilities and designing new equipment including appliances."
>
> "Changes to engineering practice to reduce ELF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or little or no cost."

"When changes to existing ELF sources are contemplated, ELF field reduction should be considered alongside safety, reliability and economic aspects."

3.9.4.4 International Agency for Research on Cancer

In June 2001, the IARC, a branch of the WHO, evaluated the carcinogenic risk to humans of static and ELF EMF. In October 2001, the WHO published a Fact Sheet that summarized the IARC findings. Below is an excerpt from the fact sheet:

> In June 2001, an expert scientific working group of IARC reviewed studies related to the carcinogenicity of static and ELF EMFs. Using the standard IARC classification that weighs human, animal and laboratory evidence, ELF magnetic fields were classified as possibly carcinogenic to humans based on epidemiological studies of childhood leukaemia. Evidence for all other cancers in children and adults, as well as other types of exposures (i.e., static fields and ELF electric fields) was considered not classifiable either due to insufficient or inconsistent scientific information.
>
> "Possibly carcinogenic to humans" is a classification used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals.
>
> This classification is the weakest of three categories ("is carcinogenic to humans," "probably carcinogenic to humans" and "possibly carcinogenic to humans") used by IARC to classify potential carcinogens based on published scientific evidence. Some examples of well-known agents that have been classified by IARC are listed below:

Classification	Examples of Agents
Carcinogenic to humans (usually based on strong evidence of carcinogenicity in humans)	Asbestos Mustard gas Tobacco (smoked and smokeless) Gamma radiation
Probably carcinogenic to humans (usually based on strong evidence of carcinogenicity in animals)	Diesel engine exhaust Sun lamps UV radiation Formaldehyde
Possibly carcinogenic to humans (usually based on evidence in humans which is considered credible, but for which other explanations could not be ruled out)	Coffee Styrene Gasoline engine exhaust Pickled Vegetables ELF magnetic fields

Do ELF Fields Cause Cancer?

ELF fields are known to interact with tissues by inducing electric fields and currents in them. This is the only established mechanism of action of these fields. However, the electric currents induced by ELF fields commonly found in our environment are normally much lower than the

strongest electric currents naturally occurring in the body such as those that control the beating of the heart.

Since 1979, when epidemiological studies first raised a concern about exposures to power line frequency magnetic fields and childhood cancer, a large number of studies have been conducted to determine if measured ELF exposure can influence cancer development, especially leukemia in children.

There is no consistent evidence that exposure to ELF fields experienced in our living environment causes direct damage to biological molecules, including DNA. Because it seems unlikely that ELF fields could initiate cancer, a large number of investigations have been conducted to determine if ELF exposure can influence cancer promotion or co-promotion. Results from animal studies conducted so far suggest that ELF fields do not initiate or promote cancer.

However, two recent pooled analyses of epidemiological studies provide insight into the epidemiological evidence that played a pivotal role in the IARC evaluation. These studies suggest that, in a population exposed to average magnetic fields in excess of 0.3 to 0.4 microtesla (μT), twice as many children might develop leukemia compared to a population with lower exposures. In spite of the large number data base, some uncertainty remains as to whether magnetic field exposure or some other factor(s) might have accounted for the increased leukemia incidence.

Childhood leukemia is a rare disease with 4 out of 100,000 children between the ages of 0 to 14 diagnosed every year. Also average magnetic field exposures above 0.3 or 0.4 μT in residences are rare. It can be estimated from the epidemiological study results that less than 1 percent of populations using 240 volt power supplies are exposed to these levels, although this may be higher in countries using 120 volt supplies.

The IARC review addresses the issue of whether it is feasible that ELF-EMF pose a cancer risk. The next step in the process is to estimate the likelihood of cancers in the general population from the usual exposures and to evaluate evidence for other (non-cancer) diseases. This part of the risk assessment should be finished by WHO in the next 18 months."

3.9.4.5 American Cancer Society

In the journal A Cancer Journal for Clinicians, the ACS reviewed EMF residential and occupational epidemiologic research in an article written by Dr. Clark W. Heath, Jr., ACS's Vice President of Epidemiology and Surveillance Research. Dr. Heath reviewed 13 residential epidemiologic studies of adult and childhood cancer. Dr. Heath wrote:

> "Evidence suggesting that exposure to EMF may or may not promote human carcinogenesis is mostly based on...epidemiologic observations...While those observations may suggest such a relationship for leukemia and brain cancer in particular, the findings are weak, inconsistent, and inconclusive...The weakness and inconsistent nature of epidemiologic data, combined with the continued dearth of coherent and reproducible findings from experimental laboratory research, leave one uncertain and

rather doubtful that any real biologic link exists between EMF exposure and carcinogenicity."

3.9.4.6 American Medical Association

The AMA adopted recommendations of its Council on Scientific Affairs (CSA) regarding EMF health effects. The report was prepared as a result of a resolution passed by AMA's membership at its 1993 annual meeting. The following recommendations are based on the CSA's review of EMF epidemiologic and laboratory studies to date, as well as on several major literature reviews:

- Although no scientifically documented health risk has been associated with the usually occurring levels of electromagnetic fields, the AMA should continue to monitor developments and issues related to the subject.
- The AMA should encourage research efforts sponsored by agencies such as the National Institutes of Health, the U.S. DOE, and the National Science Foundation. Continuing research should include study of exposures to EMF and its effects, average public exposures, occupational exposures, and the effects of field surges and harmonics.
- The AMA should support the meeting of an authoritative, multidisciplinary committee under the auspices of the National Academy of Sciences or the National Council on Radiation Protection and Measurements to make recommendations about exposure levels of the public and workers to EMF and radiation.

3.9.5 CALIFORNIA PUBLIC UTILITIES COMMISSION DECISION SUMMARY

3.9.5.1 Background

On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of EMF from utility facilities and power lines. A working group of interested parties, called the California EMF Consensus Group, was created by the CPUC to advise it on this issue. It consisted of 17 stakeholders representing citizens groups, consumer groups, environmental groups, state agencies, unions, and utilities. The Consensus Group's fact-finding process was open to the public, and its report incorporated concerns expressed by the public. Its recommendations were filed with the Commission in March 1992.

In August 2004, the CPUC began a proceeding known as a "rulemaking" (R.04-08-020) to explore whether changes should be made to existing CPUC policies and rules concerning EMF from electric transmission lines and other utility facilities.

Through a series of hearings and conferences, the Commission evaluated the results of its existing EMF mitigation policies and addressed possible improvements in implementation of these policies. The CPUC also explored whether new policies are warranted in light of recent scientific findings on the possible health effects of EMF exposure.

The CPUC completed the EMF rulemaking in January 2006 and presented these conclusions in Decision D.06-01-042:

- The CPUC affirmed its existing policy of requiring no-cost and low-cost mitigation measures to reduce EMF levels from new utility transmission lines and substation projects.

- The CPUC adopted rules and policies to improve utility design guidelines for reducing EMF, and provides for a utility workshop to implement these policies and standardize design guidelines.

- Despite numerous studies, including one ordered by the Commission and conducted by the CDHS, the CPUC stated, "we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences."

- The CPUC said it will "remain vigilant" regarding new scientific studies on EMF, and if these studies indicate negative EMF health impacts, the Commission will reconsider its EMF policies and open a new rulemaking if necessary.

In response to a situation of scientific uncertainty and public concern, the decision specifically requires PG&E to consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities. It directs that no-cost mitigation measures be undertaken, and that low-cost options—when they meet certain guidelines for field reduction and cost—be adopted through the project certification process. PG&E was directed to develop, submit, and follow EMF guidelines to implement the CPUC decision. Four percent of total project budgeted cost is the benchmark in implementing EMF mitigation, and mitigation measures should achieve incremental magnetic field reductions of at least 15 percent.

3.9.5.2 No-Cost and Low-Cost Measures Incorporated Into Project

To comply with CPUC requirements, the following "no-cost" and "low-cost" measures have been considered in the design of the project:

- The first measure that was considered would be optimal phasing. Optimal phasing would include inverting the phasing of one circuit on the same towers so that the magnetic fields emitted by the circuits cancel each other out more effectively. The phases of the Vaca Dixon-Lakeville Line already are arranged for minimum magnetic field levels at the edge of the ROW. The existing phasing would be maintained by the project.

- The second measure that was considered would be increasing the height of the line by increasing the tower height. Consistent with CPUC Decision D.06-01-042, which requires PG&E to consider "no-cost" and "low-cost" measures where feasible to reduce exposure from new or upgraded utility facilities, and consistent with PG&E's "EMF Design Guidelines for Electrical Facilities", PG&E identified and considered for EMF mitigation 69 towers in the residential land use area. The low-cost magnetic field mitigation would allow raising the 18 towers nearest to residential structures that are not already being raised and able to have a cage extension installed. These towers would be raised by 15 to 16.5 feet. The total number of towers to be raised would be larger (approximately 39 towers) because some towers would need to be raised for reasons other than EMF. Other reasons to raise towers would include compliance with CPUC GO 95, which would require a minimum clearance

between the transmission line (conductor) and the ground depending on the characteristics of the conductor.

3.10 REFERENCES

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4 INITIAL STUDY

4.1 EXISTING CONDITIONS

4.1.1 EXISTING ELECTRICAL SYSTEM

PG&E owns and operates the Vaca Dixon-Lakeville 230 kV Transmission Line, which spans the cities of Vacaville, Napa, and Petaluma; and portions of unincorporated Solano, Napa, and Sonoma counties. The existing line is located between Vaca Dixon Substation in Vacaville and Lakeville Substation in Petaluma—a distance of approximately 40 miles. A more detailed route description has been provided in Section 3.3: Project Location. Figure 3-1: Project Location depicts the existing transmission alignment. The project would require replacing the existing conductors with new conductors, and modifying approximately 39 of 189 existing lattice steel structures.

4.1.2 LOCAL SETTING AND LAND USE

The project travels within the Sacramento Valley and San Francisco Bay Area through largely undeveloped and agricultural areas. With its eastern terminus in Vacaville and its western terminus in Petaluma, the project begins in the Sacramento Valley at the east end and crosses prominent geographic features heading west, such as English Hills, Vaca Valley, Vaca Mountains, Gordon Valley, Suisun Valley, the foothills of Twin Sisters, Green Valley, the Napa River, Carneros Valley, Sonoma Valley, and Sonoma Mountains. The project is located within the Allendale, Cuttings Wharf, Fairfield North, Glen Ellen, Mt. George, Mt. Vaca, Napa, Petaluma River, Sears Point, and Sonoma 7.5-minute U.S. Geological Survey topographic quadrangles.

The project area traverses though urban, agricultural, and natural areas, including rural residential areas, open space, grazing lands, and croplands.

4.1.3 NATURAL RESOURCES

The project ranges in elevation from approximately 2 feet above mean sea level at the Napa River to approximately 1,384 feet east of Tulucay Substation in the Vaca Mountains. Topography of the project area includes flat to gently sloping valley bottoms, moderately to steeply sloping hills, side slopes, and ridgelines. These features include low to mid-elevation valleys, plains, and ridges. Precipitation increases with elevation and generally diminishes with distance moving east in the region. Locally, the climate of the project area is characterized as Mediterranean, with cool wet winters and warm, dry summers. The project alignment runs east to southwest from the interior climate of Sacramento Valley near Vacaville Substation southwest to the coastal climate and fog incursion zone of Lakeville Substation in Petaluma.

The transmission line corridor crosses several small creeks, streams, and other waterways, including the Napa River. A number of natural upland and wetland vegetation communities, and man-made developed areas, are present within the existing transmission line corridor. Vegetation is mainly dominated by non-native annual grasslands, oak woodlands, and planted crops, including orchards and vineyards. Within the non-native annual grassland are patches of native grasslands, as well as seasonal wetlands and vernal pools. Other vegetation types present include ruderal disturbed areas, freshwater and brackish marsh, coyote brush scrub, and riparian forest.

4.2 AESTHETICS

Table 4.2-1: CEQA Checklist for Aesthetics

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?			☒	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			☒	
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			☒	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			☒	

A visual assessment, which involves analysis of the viewshed surrounding the existing transmission corridor and visual simulations of the modified towers, has been prepared for this reconductoring project (Attachment C: Visual Resources Technical Study). The following analysis summarizes the conclusions of that study.

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on aesthetics resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description, as well as the permanent construction impacts resulting from replacing the conductors, installing the cage-top extensions, replacing one existing light-duty steel pole with a tubular steel pole within Tulucay Substation, and the installing solar-powered red light-emitting diode (LED) obstruction lighting on approximately three to four towers, in accordance with Federal Aviation Administration (FAA) requirements.

Question 4.1a – Scenic Vista Effects – Less-than-Significant Impact

For this evaluation, a scenic vista is defined as a distant public view along or through an opening or corridor that is recognized and valued for its scenic quality. The scenic vista at the Grape Crusher sculpture on State Route 12/State Route 29 overlooking the Napa River is the only recognized scenic vista along the project alignment. Temporary construction-related activities—workers handling equipment and construction materials along the alignment in the vicinity of the Napa River—may be seen from the vista; however, the project alignment at its nearest location is approximately 0.25 mile away from the viewpoint and is partially screened by existing

vegetation and geographic features. Furthermore, individual construction activities at any specific location (e.g., pull sites, work areas), such as those in the Napa River vicinity, would take considerably less time than the overall project construction schedule (from several days to several weeks for each work area); therefore, visual effects of construction activities would not be particularly evident or obtrusive. Because the visual effects would be minor, brief in duration, and temporary, they would not substantially affect existing views from the vista point.

The reconductoring project would include minor changes to existing infrastructure, including modifying two lattice steel towers, installing red LED obstruction lighting on three to four towers (in accordance with FAA requirements), and replacing aerial marker balls, that may be visible from this location. Because of the distance of the vista from the project alignment and the vegetative and topographic screening present, these changes would be barely evident and would be unlikely to be noticed by the casual observer (see Attachment C: Visual Resources Technical Study). Therefore, the reconductoring project would not affect the State Route 12/State Route 29 scenic vista and the impact would be less than significant.

Question 4.1b – Scenic Resource Damage within a State Scenic Highway (i.e., trees, rock outcroppings, and historic buildings) – Less-than-Significant Impact

No Designated State Scenic Highways are located near the project alignment; the closest Designated State Scenic Highway, State Route 12 north of London Way in Sonoma County, is located approximately 5 miles north, and the project would not be visible from this roadway. Thus, the reconductoring project would not affect scenic resources within a Designated State Scenic Highway corridor. Therefore, no impact would occur.

The analysis also considered Eligible State Scenic Highways and designated county scenic routes from which project changes would be visible. As demonstrated in the set of visual simulation figures, the minor changes resulting from the reconductoring project would not substantially alter the landscape character or quality currently seen in views from these roadways (see Attachment C: Visual Resources Technical Study). Therefore, the impact would be less than significant.

Question 4.1c – Visual Character Degradation – Less-than-Significant Impact

Temporary construction-related visual impacts would result from the visibility of helicopter and ground-based equipment, materials, and work crews along the project alignment and at existing substations. Construction activities would be noticeable to varying degrees, and they would be seen by local residents, motorists, and recreationalists. Construction activities would take place over approximately 12 months; however, construction-related visual effects would be relatively short term because the duration of construction would be limited (from several days to several weeks) at any individual location along the project alignment. Where possible, PG&E-owned parcels or other nearby, existing industrial properties would be utilized for these activities.

Project construction would not require substantial tree removal or grading, and site preparation is not expected to be required at the majority of the temporary tower work areas. Some work may include vegetation removal, tree trimming, or minor grading/blading of equipment pads, as needed. Construction crews primarily would use existing roads. In most locations, site restoration is not expected to be necessary, and temporary roads or routes would be reseeded or

allowed to revegetate naturally, following completion of construction. Therefore, the impact would be less than significant.

Project construction would likely require the removal or trimming of approximately five mature eucalyptus trees at the western edge of Tulucay Substation. These trees partially screen some of the substation structures from limited areas along three nearby public roads, including State Route 221 (a Napa County scenic route). Tree removal may result in the substation becoming more visible from a limited area; however, transmission structures and other infrastructure-related elements are characteristic landscape features seen within the foreground of views in the area. As a result, the changes would have an incremental visual effect that would not substantially affect the landscape setting, and the impact would be less than significant. Furthermore, as discussed in Chapter 3, Project Description, in areas where tree trimming would be required, trees would be pruned to minimize loss of visual screening. If existing trees need to be removed, they would be replaced with trees that are a lower-growing, drought-tolerant species native to California. Similar plantings to supplement and fill in the gaps within the existing hedgerow located on the western side of the substation may also be implemented to provide additional screening. All landscaping would be consistent with PG&E and California Public Utilities Commission (CPUC) safety, operations, and maintenance requirements for landscaping in proximity to a transmission facility and, where CPUC requirements allow, trees and vegetation would be allowed to regrow naturally. Therefore, the less-than-significant impact would be further reduced.

Thirty-nine of the approximately 190 towers along the project alignment would be modified with cage-top extensions to increase the height of the structures by up to 16.5 feet. However, the existing towers range in height from approximately 94 feet to 204 feet, and the general appearance of these structures would be unchanged. The reconductoring project would not obstruct views of the surrounding hillsides, ridgelines, or mountains, and the visual changes would be minor and not particularly noticeable to the public. The set of before and after simulation views demonstrate that the visual changes associated with the reconductoring project would not substantially affect the existing landscape character or visual quality in the area (see Attachment C: Visual Resources Technical Study). Therefore, the impact would be less than significant.

Question 4.1d – New Light or Glare – Less-than-Significant Impact

Construction activities generally would occur during daylight hours; however, nighttime construction may be required at specific locations. If nighttime construction work were required, portable temporary lighting would be used to illuminate the immediate work area. If required, the temporary lighting would be focused on work areas and directed on site to minimize potential effects with respect to nearby potentially sensitive receptors, particularly residences. If nighttime construction activities occur, the scope of activities would be limited and the duration would be temporary and short term. Implementation of APM-AE-1 would focus and direct temporary lighting, and the less-than-significant impact would be further reduced.

The only new source of permanent lighting is the addition of obstruction lighting that would be installed on approximately three to four towers northeast of Tulucay Substation. The lighting would consist of solar-powered red LED lighting on tower structures in accordance with FAA

requirements. Because the proposed lighting would be installed to comply with nighttime air navigation safety requirements and would not create a substantial source of lighting, the impact would be less than significant.

Glare exists when a high degree of contrast between bright and dark areas in a field of view make it difficult for the human eye to adjust to differences in brightness. At high levels, glare can make it difficult to see, such as when driving westward at sunset. The existing transmission line corridor includes electric transmission, distribution, and substation facilities that are visible within the public viewshed. Potential glare from overhead conductors would be similar to what currently exists along the project alignment under baseline conditions. The new cage-top extensions would be dull, non-reflective steel that would not create glare after 1 to 2 years of weathering. Therefore, the impact would be less than significant.

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4.3 AGRICULTURE AND FORESTRY RESOURCES

Table 4.3-1: CEQA Checklist for Agriculture and Forestry Resources

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			☒	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				☒
c) 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))?				☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?				☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on agriculture and forestry resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

4.3.1 REGULATORY BACKGROUND

4.3.1.1 Federal

No federal regulations related to agricultural or forest resources pertain to the reconductoring project.

4.3.1.2 State

Williamson Act

The Williamson Act, or California Land Conservation Act, (California Government Code Section 51200 et seq.) is a state law 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. In return, Williamson Act parcels receive a lower property tax rate that is consistent with their actual use instead of their market rate 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]). The existing transmission line alignment, and therefore, the reconductoring project alignment, crosses Williamson Act lands in Solano, Napa, and Sonoma counties.

California Government Code Section 51238

California Government Code Section 51238 includes the provisions related to the Williamson Act that state, "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."

Farmland Mapping and Monitoring Program

The California Department of Conservation (DOC) Division of Land Resource Protection maps agriculturally viable lands and designates them as Prime, Unique, or Farmland of Statewide Importance. The reconductoring project alignment crosses mapped farmlands in Solano, Napa, and Sonoma Counties.

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 (TPZs) to restrict and protect commercial timber resources. The reconductoring project alignment does not cross any TPZ land.

California Public Resources Code

The California Public Resources Code (PRC) contains the following definitions:

- Forest Land: Section 12220(g) of the PRC 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.

- Timberland: Section 4526 of the PRC 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 that is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees.

4.3.1.3 Local

PG&E is not subject to local discretionary land use regulations. However, PG&E has considered local plans and policies—including the Solano County Code, Napa County Code, Sonoma County Code of Ordinances, Vacaville Municipal Code, and City of Napa Municipal Code—as part of the environmental review process. More information about these plans and policies can be found in Section 4.10, Land Use and Planning.

Question 4.2a – Farmland Conversion – Less-than-Significant Impact

The reconductoring project construction activities would require establishment and use of various temporary work areas, including pull and tension sites, helicopter landing zones, construction yards, and tower and guard structure work areas. Removal of crops or vines from some temporary work areas may be necessary, and up to approximately 90 acres of Farmland, primarily in Napa and Sonoma counties, would be temporarily converted to non-agricultural use during project construction. The removal of crops or vines would be temporary and short term in nature. Therefore, the reconductoring project would not permanently convert Farmland to non-agricultural use. PG&E would implement APM-AG-1 to compensate landowners for land cleared for construction purposes. This APM would ensure that existing agricultural fields would be returned to pre-construction conditions to further reduce any potential temporary, short-term impact. Therefore, the impact would be less than significant.

Question 4.2b – Agricultural Zoning or Williamson Act Conflicts – No Impact

The project would involve reconductoring an existing transmission line located within an existing utility corridor that does not conflict with existing zoning for agricultural use. Public utility facilities are allowed under agricultural zoning designations in Solano, Sonoma, and Napa counties, as well as the cities of Napa and Vacaville. Therefore, the reconductoring project would not conflict with existing zoning for agricultural use. Public utility facilities also are designated as an allowable use, compatible with agricultural use according to California Government Code 51238, which states that the erection, construction, alteration, or maintenance of electric facilities are considered to be compatible uses within any agricultural preserve.

Project construction activities on land currently used for agricultural production would not affect the status of the agricultural land zoning, and existing agricultural land uses would resume to pre-project conditions after construction is completed. Furthermore, the reconductoring project would not remove any land from Williamson Act contracts. Therefore, no impact would occur.

Question 4.2c – Forest Land or Timberland Zoning Conflicts – No Impact

No forest land, timberland, or timberland zoned Timberland Production is located within or along the existing transmission line corridor or the proposed reconductoring project work areas. Therefore, no impact would occur.

Question 4.2d – Loss or Conversion of Forest Land – No Impact

No forest land is located within or along the existing transmission line corridor or the proposed reconductoring project work areas. Therefore, no impact would occur.

Question 4.2e – Other Farmland or Forest Land Conversion – No Impact

The reconductoring project would upgrade an existing transmission line that is located within an existing utility corridor. Thus, project implementation would not discourage the continued use of surrounding land for agricultural purposes. Therefore, no impact would occur.

4.3.2 REFERENCES

California Department of Conservation (DOC). 2010. Important Farmland Data Availability. Available: http://redirect.conservation.ca.gov/DLRP/fmmp/product_page.asp. Accessed October 11, 2012.

County of Napa, Department of Agriculture and Weights and Measures. 2011. Agricultural Crop Report. Available: http://www.countyofnapa.org/AgCommissioner/CropReport/. Accessed October 12, 2012.

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4.4 AIR QUALITY AND GHG EMISSIONS

Table 4.4-1: CEQA Checklist for Air Quality and GHG Emissions

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?		☒		
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		☒		
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?		☒		
d) Expose sensitive receptors to substantial pollutant concentrations?		☒		
e) Create objectionable odors affecting a substantial number of people?			☒	
f) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			☒	
g) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			☒	

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on air quality and greenhouse gas (GHG) emissions resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, as detailed in Chapter 3, Project Description.

Project-related GHG emissions would occur in areas under the jurisdictions of the Bay Area Air Quality Management District (BAAQMD) and the Yolo-Solano Air Quality Management District (YSAQMD).

BAAQMD CEQA 1999 Air Quality Guidelines provide a set of criteria to assist in the preliminary evaluation of impacts on air quality and how to accurately assess and mitigate project-related impacts on air quality. YSAQMD also has developed a CEQA Handbook to assist lead agencies and project applicants as they prepare air quality analyses (YSAQMD 2007). An air quality and GHG emissions analysis for the reconductoring project was conducted using these criteria. Details of the calculations and model outputs are provided in Attachment D: Air Quality and Greenhouse Gas Modeling Methodology and Worksheets. The following discussion summarizes the conclusions in the attachment.

Question 4.3a – Air Quality Plan Conflicts – Less-than-Significant Impact with Mitigation Incorporated

As shown in Table 4.4-2: Vaca Dixon-Lakeville Construction 230 kV Reconductoring Project Emissions (BAAQMD Jurisdiction), the average daily project construction activity emissions of particulate matter (PM) less than 10 microns in diameter (PM_{10}), PM less than 2.5 microns in diameter ($PM_{2.5}$), nitrogen oxide (NO_x), and volatile organic compounds (VOCs) would be below the BAAQMD significance thresholds that were developed, in part, to promote consistency with ongoing and relevant attainment planning efforts.[7] The BAAQMD does not have a quantitative threshold for fugitive dust during project construction activities. Rather, the BAAQMD CEQA Air Quality Guidelines require projects to implement best management practices that would minimize the generation of fugitive dust from earth-disturbing activities. APM-AQ-2 includes applicable provisions from the BAAQMD Basic Construction Control Measures, which would fulfill the control measure requirements of the BAAQMD to reduce fugitive dust impacts to a less-than-significant level. Because the project's average daily emissions would not exceed any of the BAAQMD thresholds of significance and all applicable control measures to minimize fugitive dust would be implemented as part of the project's APMs, construction emissions would not conflict with any applicable air quality plans. Therefore, the impact would be less than significant with mitigation incorporated.

Table 4.4-3: Vaca Dixon-Lakeville 230 kV Reconductoring Project Construction Emissions (YSAQMD Jurisdiction) shows the total emissions associated with project construction activities that would occur within the YSAQMD jurisdiction. The table shows that construction emissions within the YSAQMD would be well below the annual thresholds of significance for criteria pollutants, which were developed, in part, to promote consistency with ongoing and relevant attainment planning efforts. Thus, construction emissions would not conflict with any applicable air quality plans and the impact would be less than significant.

Question 4.3b – Air Quality Standard Violations – Less-than-Significant Impact with Mitigation Incorporated

The BAAQMD is currently designated as a nonattainment area for the California ozone (O_3), $PM_{2.5}$, and PM_{10} standards, and unclassified or attainment for the remaining pollutants. The YSAQMD currently is designated as a nonattainment area for the California O_3 and PM_{10} ambient air quality standards, and unclassified or attainment for the remaining pollutants.

[7] The most recent BAAQMD CEQA Guidelines were adopted in 2010. These guidelines currently are under CEQA review and have been included in this analysis for reference purposes.

Table 4.4-2: Vaca Dixon-Lakeville Construction 230 kV Reconductoring Project Emissions (BAAQMD Jurisdiction)

Category	Pollutants			
	ROG	NOX	PM10	PM2.5
Total Emissions (tons/year) [1]	0.53	2.91	0.11	0.10
Average Daily (pounds/day) [2]	8.80	48.49	1.78	1.70
Proposed BAAQMD Thresholds of Significance (average pounds per day) [3]	54	54	82	54
Exceeds Threshold	No	No	No	No

Notes:

ROG = reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter with aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; tons/yr = tons per year; lbs/day = pounds per day; BAAQMD = Bay Area Air Quality Management District.

[1] Total emissions were estimated using assumptions and methods provided in Attachment D: Air Quality and Greenhouse Gas Modeling Methodology and Worksheets. Emissions include additional construction activities that may not occur as part of the project. Therefore, these emissions are a conservative estimate of total construction emissions.

[2] Average daily emissions were estimated using 120 days (5 months) for construction activities. In reality, construction activities are likely to occur over 9 months to a full year. However, to account for the minimum number of days that construction could potentially be completed if circumstances require it, and to conservatively estimate average daily construction emissions, 120 days was used.

[3] This air quality analysis was performed using the 1999 BAAQMD CEQA Guidelines, which do not prescribe quantitative thresholds of significance. Nevertheless, for full disclosure and in case the 2010 BAAQMD Guidelines are implemented before the project is approved, the project's construction emissions have been quantified and compared with the proposed 2010 BAAQMD thresholds of significance for construction.

Source: Data compiled by AECOM in 2013

Table 4.4-3: Vaca Dixon-Lakeville 230 kV Reconductoring Project Construction Emissions (YSAQMD Jurisdiction)

Category	Pollutants			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Total Emissions (tons/year)[1]	0.64	3.00	0.11	0.11
Daily Emissions (pounds/day)	-	-	5.46	5.26
YSAQMD Thresholds of Significance[2]	10	10	80	-
Exceeds Threshold?	No	No	No	No

Notes:

ROG = reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter with aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; tons/yr = tons per year; lbs/day = pounds per day; YSAQMD = Yolo-Solano Air Quality Management District.

[1] Total emissions were estimated using the methodology described in provided in Attachment D: Air Quality and Greenhouse Gas Modeling Methodology and Worksheets. Emissions include additional construction activities that may not occur as part of the project. Therefore, these emissions are a conservative estimate of total construction emissions.

[2] The YSAQMD thresholds of significance for construction are 10 tons per year for ROG and NO_X and 80 pounds per day for PM_{10}.

Source: Data compiled by AECOM in 2013

Considering the low level of emissions estimate for the reconductoring project, these emissions would not exceed the California Ambient Air Quality Standards or National Ambient Air Quality Standards, and they would not contribute substantially to any existing or project-related air quality violations for criteria pollutants for which the BAAQMD or the YSAQMD currently is designated as a nonattainment area.

As shown in Table 4.4-2: Vaca Dixon-Lakeville Construction 230 kV Reconductoring Project Emissions (BAAQMD Jurisdiction) and Table 4.4-3: Vaca Dixon-Lakeville 230 kV Reconductoring Project Construction Emissions (YSAQMD Jurisdiction), project-related construction emissions within the BAAQMD and the YSAQMD would not exceed any ozone precursor (VOCs and NO_X), PM_{10}, or $PM_{2.5}$ thresholds of significance. Because of the short-term nature of these emissions and to comply with all applicable significance thresholds, impacts from O_3, $PM_{2.5}$, and PM_{10} emissions would be less than significant with respect to the YSAQMD's guidance. However, because the BAAQMD requires all projects, regardless of the level of emissions, to implement the Basic Construction Control Measures, PG&E would implement APM-AQ-1 and APM-AQ-2 to reduce construction impacts to a less-than-significant level. Thus, because the reconductoring project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation, and because PG&E would implement APM-AQ-1 and APM-AQ-2, which would include all of the BAAQMD Basic Construction Control Measures, the impact would be less than significant with mitigation incorporated.

Question 4.3c – Cumulative Criteria Pollutant Increases – Less-than-Significant Impact with Mitigation Incorporated

Project construction would create a temporary increase in criteria air pollutants. The BAAQMD 1999 CEQA Guidelines and the YSAQMD CEQA Guidelines state that project impacts which are potentially significant to air quality on a project level also may cause a cumulatively considerable contribution. Thus, projects that do not have potentially significant impacts on air quality on a project level would not be a potential cause of a cumulatively considerable contribution to air quality. As shown in Table 4.4-3: Vaca Dixon-Lakeville 230 kV Reconductoring Project Construction Emissions (YSAQMD Jurisdiction), air quality impacts in the YSAQMD would be less than significant on a project level. Therefore, the reconductoring project's contribution to a potential cumulative impact would be less than significant.

To reduce fugitive dust emissions, PG&E would implement APM-AQ-2, which would include all of the required fugitive dust-related BAAQMD Basic Construction Control Measures. In addition, APM-AQ-1 would reduce exhaust-related PM_{10} and $PM_{2.5}$ emissions along with ozone precursor criteria air pollutants (e.g., VOCs, NO_X, carbon dioxide [CO_2]), which would include all of the exhaust-related BAAQMD Basic Construction Control Measures. As discussed previously, in the BAAQMD, air quality impacts from construction activities would be less than significant with the implementation of APM-AQ-1 and APM-AQ-2, which collectively would include all of the BAAQMD Basic Construction Control Measures. Therefore, the reconductoring project's contribution to a potential cumulative impact would be less than significant with mitigation incorporated.

Question 4.3d – Sensitive Receptor Exposure – Less-than-Significant Impact with Mitigation Incorporated

For purposes of this analysis, a "sensitive receptor" is an area where human populations—especially children, seniors, and sick persons—are located, and where a reasonable expectation exists for continuous human exposure within air quality standard averaging periods (i.e., 24-hour, 8-hour, and 1-hour). Sensitive receptors typically include residences, hospitals, and schools.

Some residential properties would be nearby project work areas, with approximately 95 residences located within 500 feet of the existing transmission line corridor and project work areas. The closest sensitive receptors include three residences within 100 feet of the existing transmission line corridor. Because of their proximity to project work areas, sensitive receptors would be exposed to temporary increases in criteria air pollutants from fugitive dust and increased equipment use within temporary work spaces and landing zones. In addition, construction activities would generate toxic air contaminants (TACs) in the form of diesel PM from on-road vehicle and off-road equipment use. Because of the nature of the reconductoring project, these exposures would be limited to construction areas where active construction typically would last between 1 and 20 days. In addition, any earth-disturbing activities would include implementation of APM-AQ-2 to minimize fugitive PM dust emissions. Furthermore, exhaust emissions would be minimized from diesel-fueled construction equipment and worker vehicles through implementation of APM-AQ-1, which would further reduce the TAC emissions in these areas. Therefore, the impact would be less than significant with mitigation incorporated.

The reconductoring project would not be located in an area that was determined to contain naturally occurring asbestos (NOA). Therefore, no impact would occur.

Question 4.3e – Odor – Less-than-Significant Impact

Typical odor nuisances are generated from land uses (e.g., from wastewater treatment plants, landfills, food processing plants, and manufacturing facilities, among others). The reconductoring project would not include any type of land use that would generate substantial odor emissions. In addition, no substantial sources of odor emissions would be used or generated during construction. Diesel engines used during construction could also emit odors. As previously discussed, the closest sensitive receptors include three residences within 100 feet of project work areas. However, few sources of odors would exist and construction activities would be short term and intermittent, generally lasting only a few days at each tower. Therefore, the impact would be less than significant.

Question 4.3f – Greenhouse Gas Emissions – Less-than-Significant Impact

Neither the BAAQMD nor the YSAQMD has quantitative GHG emission thresholds for construction. On October 24, 2008, the California Air Resources Board (CARB) released its interim CEQA significance thresholds for GHGs. The guidance divides projects analyzed under CEQA into two categories—industrial and residential/commercial—and provides significance criteria for each. The reconductoring project qualifies as an industrial project; thus, impacts would be considered less than significant if the project, with mitigation incorporated, would emit

no more than approximately 7,000 metric tons (MT) of carbon dioxide equivalent (CO_2e) per year from operation of non-transportation-related GHG sources. Table 4.4-4: Vaca Dixon-Lakeville 230 kV Reconductoring Project Construction
-Related GHG Emissions shows the total GHG emissions expected to result from project construction. The reconductoring project's construction emissions, when totaled across the entire construction schedule in both the BAAQMD and the YSAQMD jurisdictions, would be approximately 564 MT of CO_2e, which would be well below (i.e., approximately 8 percent) the CARB limit of 7,000 MT. Thus, the reconductoring project's construction-related GHG emissions would not be cumulatively considerable. Furthermore, APM-AQ-1 (which is designed to minimize air quality exhaust emissions) would help to reduce the project's GHG emissions. Therefore, the impact would be less than significant.

Table 4.4-4: Vaca Dixon-Lakeville 230 kV Reconductoring Project Construction -Related GHG Emissions

Category	MT CO_2e/yr [1]
BAAQMD Jurisdiction Construction[1]	261
YSAQMD Jurisdiction Construction[1]	303
Total Construction Emissions	564

Notes:
MT CO_2e/yr = metric tons of carbon dioxide equivalent per year; BAAQMD = Bay Area Air Quality Management District; YSAQMD = Yolo-Solano Air Quality Management District.
[1] To yield a conservative analysis, construction activities were assumed to be completed within one calendar year. Thus, the annual emissions shown here also represent the project's total construction emissions.
[2] Both the BAAQMD and the YSAQMD construction emissions would include activities that may not occur as part of the project. Therefore, the emissions shown here represent a conservative analysis of the project's construction emissions.
Source: Data compiled by AECOM in 2013

Question 4.3g – Applicable Greenhouse Gas Plan Conflicts – Less-than-Significant Impact

As previously discussed in the response to Question 4.3f, the reconductoring project's modeled construction emissions would be below applicable GHG significance thresholds. Project construction would not conflict with any State or local GHG plans or goals. Therefore, the impact would be less than significant.

4.4.1 REFERENCES

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4.4 BIOLOGICAL RESOURCES

Table 4.4-1: CEQA Checklist for Biological Resources

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		☒		
b) 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 the California Department of Fish and Game or U.S. Fish and Wildlife Service?		☒		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		☒		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on biological resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring of the existing Vaca Dixon-Lakeville 230 kV Transmission Line as detailed in Chapter 3, Project Description, as well as the permanent construction impact resulting from stream and wetland crossing improvements to facilitate construction access.

4.4.1 REGULATORY BACKGROUND

4.4.1.1 Federal

Federal Endangered Species Act

The Endangered Species Act (ESA) protects plants and wildlife species that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NOAA Fisheries).

Under Section 9, the ESA 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 U.S. Code [USC] 1532[19], 1538). This also can include the modification of a species' habitat. 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 ESA, federal agencies are required to consult with the USFWS and/or NOAA Fisheries if their actions, including permit approvals or federal funding, could adversely affect a listed species (including plants) or its critical habitat. Through Section 7 consultation and the issuance of a Biological Opinion, the USFWS and/or NOAA Fisheries may issue an incidental take permit, allowing take of the species that is incidental to another authorized activity, provided that the action will not jeopardize the continued existence of the species.

Section 10 of the ESA provides for issuance of incidental take permits for private actions that have no federal involvement, through the development of a Habitat Conservation Plan (HCP).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC Sections 703–711) recognizes international treaties between the U.S. and other countries that have afforded protection to migratory birds and any of their parts, eggs, and nests, from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act makes it unlawful to import, export, take (including harassment), sell, purchase, or barter any bald eagle or golden eagle, or parts thereof. USFWS oversees enforcement of this act. The 1978 amendment authorizes the U.S. Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations.

On September 11, 2009, USFWS announced a final rule on two permit regulations that allows take of eagles and eagle nests under this act. The permits authorize limited non-purposeful take of bald eagles and golden eagles, authorizing individuals, companies, governments agencies (including tribal governments), and other organizations to disturb or otherwise take eagles in the course of conducting lawful activities, such as operating utilities and airports. Removal of eagle nests usually is allowed only when it is necessary to protect human safety or the eagles. Most

permits issued under these regulations authorize disturbance. In limited cases, a permit may authorize the physical take of eagles, but only if precautions are taken to avoid physical take.

Waters and Wetlands: Clean Water Act

The purpose of the Clean Water Act (CWA) (Sections 401 and 404, 33 USC Section 1251 et seq.) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The definition of "waters of the United States" includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 Code of Federal Regulations 328.3 7b).

The U.S. Army Corps of Engineers (USACE) issues permits for work in wetlands and other waters of the United States based on guidelines established under Section 404 of the CWA. Section 404 of the CWA prohibits the discharge of dredged or fill material into "waters of the United States", including wetlands, without a permit from USACE. The U.S. Environmental Protection Agency (EPA) also has authority over wetlands and may, under Section 404(c), veto a USACE permit. Depending on the amount of impacts on waters of the United States, a USACE Section 404 permit application can either: a) invoke usage of a nationwide permit for projects with minimal adverse effects or b) entail the submittal of an individual permit application for projects that do not fall under a nationwide permit.

Section 401 of the CWA requires all Section 404 permit actions to obtain a state water quality certification or waiver, as described in more detail in Section 4.8, Hydrology, Water Quality, and Beneficial Uses of Waters of the State.

4.4.1.2 State

California Endangered Species Act

The California Endangered Species Act (CESA), adopted in 1984, generally parallels the main provisions of the ESA and includes Sections 2050 through 2098 of the California Fish and Game Code (CFGC). Section 2080 prohibits the taking, 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 CFGC as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Sections 2050-2089 of the CFGC and CESA regulate the protection of state-listed endangered and threatened species. These sections prohibit "take" of such species, unless specifically authorized by the California Department of Fish and Wildlife (CDFW). The state definition of "take" is to "hunt, pursue, catch, capture, or kill a member of a listed species or attempt to do so."

California Fish and Game Code Sections 2835, 3511, 4700, 5050, and 5515

California first began to designate species as "fully protected" before the creation of the CESA and the federal ESA. Certain animals are "fully protected" under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish). Most fully protected species have since been listed as threatened or endangered under the CESA and/or the federal ESA. Fully protected species may not be taken or possessed at any time, and incidental take permits cannot be issued for these species unless it is with implementation of a Natural Community Conservation Plan (NCCP; Section 2835.

California Fish and Game Code Section 1600 et seq.

Section 1602 of the Fish and Game Code states that a notification is required to be submitted to CDFW by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement is to be prepared. The agreement is to include reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). The entity may proceed with the activity in accordance with the final agreement. If CDFW determines that the activity will not substantially adversely affect existing fish or wildlife resources, the entity may commence the activity without an agreement, as long as it is conducted as described in the notification, including any measures in the notification that are intended to protect fish and wildlife resources.

California Fish and Game Code Section 3503 et seq.

Section 3503 of the CFGC states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3513 makes it unlawful to take possess, or destroy any birds of pretty or to take, possess, or destroy the nest or eggs of any such bird.

Native Plant Protection Act of 1977, California Fish and Game Code Sections 1900–1913

The Native Plant Protection Act (NPPA) of 1977 (CFGC Sections 1900–1913) was created with the intent to "preserve, protect, and enhance rare and endangered plants in this state." The NPPA is administered by CDFW. The Fish and Game Commission has the authority to designate native plants as "endangered" or "rare," and to protect them from take.

Title 14, California Code of Regulations Sections 670.2 and 670.5

Title 14 of the California Code of Regulations, Sections 670.2 and 670.5 list animals designated as threatened or endangered in California. Species of special concern is a category conferred by CDFW on those species that are indicators of regional habitat changes or considered potential future protected species. Species of special concern (SSC) do not have any special legal status; however, Section 15380 of the CEQA Guidelines indicates that SSC should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

Oak Woodlands Conservation Act

California's Oak Woodlands Conservation Act recognizes the importance of private land stewardship to the conservation of the state's valued oak woodlands. The act established the

California Oak Woodlands Conservation Program, which is designed to help local efforts achieve oak woodland protection and to promote ecologically healthy functioning oak woodlands. The program offers landowners, conservation organizations, cities, and counties, an opportunity to obtain funding for projects designed to conserve and restore California's oak woodlands on a regional basis (CWCB 2012).

Porter-Cologne Water Quality Control Act

The State Water Resources Control Board and the nine Regional Water Quality Control Boards have jurisdiction over all surface water and groundwater in the state, including wetlands, headwaters, and riparian areas. The state or regional board must issue waste discharge requirements for any activity that could affect the quality of waters of the State. In 2008, the State Water Resources Control Board (State Water Board) passed Resolution 2008-0026 for "development of a policy to protect wetlands and riparian areas in order to restore and maintain the water quality and beneficial uses of the waters of the State." Phase 1 of this effort, currently underway, includes a wetland definition and associated delineation methods, an assessment framework for collecting and reporting aquatic resource information, and requirements applicable to discharges of dredged or fill material.

4.4.1.3 Local

PG&E is not subject to local discretionary regulations. However, PG&E has considered local plans and policies as part of its environmental review process. The following analysis of local regulations relating to biological resources in Solano, Sonoma, and Napa counties is provided for informational purposes and to assist with CEQA review.

Solano County General Plan

The resource chapter of the Solano County General Plan aims to preserve, enhance, and restore the county's diverse landscapes and ensure the sustainability of its resources. The plan emphasizes focused conservation and protection efforts in key habitats that are targeted for biological resources management; however, none of these targeted areas overlap the existing project area. The resource chapter also identifies policies to protect oak woodlands and heritage trees, by encouraging the planting of native tree species and development of an ordinance to protect oak woodlands and heritage trees. (Solano County Planning Services 2008)

Policy RS.I-3 regards a tree ordinance to protect oak woodlands and heritage oak trees. Heritage trees, as defined in Senate Bill (SB) 1334, are: (a) a tree with a trunk diameter of 15 inches or more, measured at 54 inches above natural grade, (b) any oak tree native to California, with a diameter of 10 inches above natural grade, or (c) any tree or group of trees specifically designated by Solano County for protection because of its historical significance, special character, or community benefit (Solano County 2008).

Napa County General Plan

The Conservation Chapter of the Napa County General Plan requires that impacts on rare or endangered wildlife and habitat are to be avoided to the extent feasible (Napa County Planning Division 2008). When impacts on wildlife and special-status species cannot be avoided, projects are required to include minimization measures and mitigation to a level below potentially

significant, in compliance with federal and state law. The plan states that, "only by protecting our natural resources will we ensure our continued ability to benefit from cultivation of the earth" (Policy CON-22). Goals are focused on conserving resources, preserving natural lands, and maintaining and enhancing biodiversity in the county. Policy CON-24 focuses on maintaining and improving oak woodland habitat, soils, species diversity, and wildlife habitat, by preserving lands, providing replacement of lost oak woodlands, and complying with the Oak Woodlands Preservation Act (California Public Resources Code Section 21083.4)

The plan is aimed at protecting aquatic resources, including sensitive riparian habitats and wetlands. When avoidance of impacts on riparian habitat is infeasible along stream reaches, appropriate measures are required so that protection, restoration, and enhancement activities occur within identified stream reaches that support or could support native fisheries and other sensitive aquatic organisms. The plan calls for no net loss of aquatic habitat functions and values within the county's watersheds.

Sonoma County General Plan

The Sonoma County General Plan addresses the special-status wildlife and plants, wetlands, sensitive natural communities, and habitat connectivity corridors that exist in Sonoma County. The Open Space and Resource Conservation Chapter of the Sonoma County General Plan identifies Biotic Habitat Areas and requires that impacts on rare or endangered wildlife and habitat in these areas will be mitigated at least two times the acreage affected, unless a lower level is acceptable under federal and state law (Sonoma County Planning Services 2008). Work in designated marshes and wetlands require a setback of 100 feet from the delineated edges of the wetland. Policies also are identified to protect oak woodlands and apply district zoning that requires adequate mitigation and monitoring for tree removal.

Riparian corridor and streamside protection is one of the plan's goals. The plan aims to protect and enhance riparian corridors and functions along streams, balancing the need for agricultural production, urban development, timber and mining operations, and other land uses with the preservation of riparian vegetation, protection of water resources, flood control, bank stabilization, and other riparian functions and values. Policy OSRC-8b calls for establishment of streamside conservation areas along both sides of designated riparian corridors as follows, measured from the top of the higher bank on each side of the stream as determined by the County's Permit and Resource Management Department: (1) Russian River riparian corridor, 200 feet; (2) flatland riparian corridors, 100 feet; and (3) other riparian corridors, 50 feet.

4.4.2 METHODOLOGY

To identify the potential for sensitive biological resources in the project area and vicinity that could be affected by the reconductoring project, a detailed literature review and multiple sensitive resource assessments were conducted. The term "project area" refers to all areas that the project encompasses, including the existing transmission line corridor, helicopter landing zones, access routes, storage areas, and substations. The term "project vicinity" refers to areas that were studied for the project but may not be affected by it, including a 5-mile buffer area surrounding the corridor for special-status plant and wildlife species. Record searches extended up to 5 miles from the project area. The term "project work areas" refers to the footprint of construction work sites identified for the project. Project work areas include construction yards

(2 to 4 acres), tower work areas (0.5 to 1 acre), guard structure work areas (0.1 to 0.5 acre), pull sites (1.4 to 2 acres), and helicopter landing zones (2 to 3 acres).

Plants and wildlife are considered to be special-status species if they meet one or more of the following criteria:

- plant and wildlife species listed as endangered, threatened, or rare under the federal ESA or CESA, including proposed and candidate species;
- wildlife species protected under the federal Bald and Golden Eagle Protection Act;
- wildlife species designated as Fully Protected (FP) species, as defined in CFGC Sections 3511, 4700, 5050, and 5515;
- wildlife species designated as SSC by CDFW;
- plant species on Lists 1 and 2 of the California Rare Plant Rank system or designated as rare by CDFW; and
- plant and wildlife species that are addressed in local or regional plans, policies, or regulations, adopted by a local governing body crossed by the project alignment.

Additional investigations regarding potential biological resources in the project vicinity included applicable databases searches; reviews of relevant scientific literature, recovery plans, and regulatory documents; and focused biological surveys.

4.4.2.1 Literature and Database Review

To initiate the evaluation, relevant literature, databases, and maps were reviewed, using the following resources:

- California Natural Diversity Database (CNDDB), maintained by CDFW (CDFW 2013)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California
- USFWS Critical Habitat Portal (USFWS 2014a)
- USFWS Sacramento District Web site (USFWS 2014b)
- Jepson Online Interchange (PG&E 2012)
- CDFW's California Bird SSC (Shuford 2008)
- Solano County Water Agency's (SCWA) Draft Multispecies HCP (SCWA 2009)
- Google Earth aerial photographs (Google 2014)
- U.S. Geological Survey topographic maps
- National Wetland Inventory maps

To determine all known occurrences of special-status species near the project area, special-status plant and wildlife species occurrences within the project vicinity were identified and are shown in Attachment E: CNDDB Special-Status Plant Species Occurrences (Confidential) and Attachment F: CNDDB Special-Status Wildlife Species Occurrences (Confidential).

In addition to database research, species recovery plans and other federal species information were reviewed, based on the results of the CNDDB, USFWS species list, and other species searches. Critical habitat designations provided by USFWS also were reviewed to identify areas of designated critical habitat that would be spanned by the reconductoring project. These sources were used to identify the special-status plant and wildlife species with potential to occur in the project vicinity.

To facilitate evaluations specific to special-status plant species, a number of additional information sources were also reviewed before conducting botanical resource surveys, including the Consortium of California Herbaria and CDFW Special Vascular Plants. Knowledge of regional biota and observations made during the field surveys contributed to botanical surveys and assessments.

4.4.2.2 Field Surveys

General reconnaissance-level surveys and detailed botanical surveys of the project area for special-status plant and wildlife species were conducted during spring and summer 2011 by Nomad Ecology, Garcia and Associates (GANDA), and Swaim Biological, Incorporated (Swaim). The field surveys included the proposed access roads, pull sites, helicopter landing zones, and a 250-foot buffer area on either side of the existing transmission line corridor (project corridor). Surveys of access roads included a 25-foot area on either side of unpaved roads and overland routes. During these field visits, habitat was assessed to determine the potential for special-status plants and wildlife in the project area (Holland 1986). In addition, focused and/or protocol-level special-status species surveys and investigations were conducted in 2011, 2012, and 2013, in instances where additional information was needed for project planning. Botanical surveys involved replicate, detailed floristic surveys and plant community mapping within the project corridor. Wildlife surveys included reconnaissance as well as protocol and modified protocol surveys for different special-status species. An overview of the resource surveys, habitat assessments, and other investigations completed for the project is provided in Table 4.4-2: Project-Specific Sensitive Resource Investigations.

4.4.3 ENVIRONMENTAL SETTING

The existing transmission corridor crosses through Solano, Napa, and Sonoma counties, roughly traversing in an east-west direction for approximately 40 miles. The project area in this corridor ranges in elevation from approximately 2 feet (less than 1 meter) above mean sea level (msl) at the Napa River to approximately 1,384 feet (421 meters) east of Tulucay Substation. The topography of the project area includes flat to gently sloping valley bottoms, moderately to steeply sloping hills, side slopes, and ridgelines. The average annual precipitation for western Solano County is between 25 and 40 inches (SCWA 2009); Napa County (near the City of Napa) averages 25 inches, and Sonoma County (near the City of Sonoma) averages 30 inches (PG&E 2012).

Table 4.4-2: Project-Specific Sensitive Resource Investigations

Survey/Assessment Type	Survey Methodology	Survey Period[1]
Botanical Resource Survey	Focused floristic surveys of an approximately 500-foot corridor, centered on the existing transmission line corridor. The surveys focused on identifying rare plants and mapping plant communities.	Surveys dates focused on blooming periods of target species, including April through September, and December 2011; and January through February 2012. Additional surveys were conducted in spring and summer 2013.
Wetland Delineation Survey	Field delineation of aquatic resources to determine their potential to be under the jurisdiction of the U.S. Army Corps of Engineers and State Water Resources Control Board. The surveys included stream and potential wetland crossing improvement locations and work areas in aquatic resources. Geographic information system (GIS) data for the locations of wetland features and special-status species were recorded.	April through June 2013
Field Reconnaissance for Waters of the State	Field reconnaissance of watercourses to determine their potential to be under the jurisdiction of the California Department of Fish and Wildlife (CDFW) was conducted in the spring of 2013. Reconnaissance was completed simultaneously with other field efforts, such as the wetland delineation, to identify features potentially under CDFW jurisdiction.	April through June 2013
Callippe Silverspot Butterfly Assessment	GIS-based analysis of *Viola* sp. locations from botanical survey data paired with associated soil types, as well as an appropriately timed presence/absence field survey of *Viola* populations for evidence of adult or larval habitation.	May through July 2012
Burrowing Owl Survey	Helicopter and ground-based assessment of potential habitat in the project area. Potentially suitable habitat surveyed for breeding owls and wintering owls.	April through July 2012 (breeding season); December 2012 through January 2013 (wintering)
Swainson's Hawk Survey	Helicopter and ground-based assessment of potential habitat in the project area. Potentially suitable habitat surveyed for breeding pairs in 2012. The survey was repeated in 2013.	April and June 2012; March through June 2013

Table 4.4-2: Project-Specific Sensitive Resource Investigations

Survey/Assessment Type	Survey Methodology	Survey Period[1]
California Black Rail and California Clapper Rail Habitat Assessment	Habitat assessment for California clapper rail and California black rail between Towers 24/108 and 25/114, along the Napa River. The assessment included research about known occurrences as well as field surveys of potential habitat areas.	January 2013
Wildlife Constraints Assessment	Reconnaissance-level wildlife and habitat surveys of an approximately 500-foot corridor, centered on the existing transmission line corridor. The surveys focused on identifying potential habitat for special-status wildlife species.	June 2011
Golden and Bald Eagle Survey	Helicopter and ground-based surveys for bald eagle and golden eagle, conducted throughout the existing transmission line corridor.	February through June 2013
Wetlands Inventory	Inventory and mapping of aquatic resources, including classification of aquatic resources within a 500-foot corridor, centered on the existing transmission line corridor.	April 2011
California Red-legged Frog Habitat Assessment	Habitat assessment for California red-legged frog, based on documented occurrences, habitat surveys, and known species range. Field data was collected by conducting aquatic sampling, visual daytime and nighttime surveys at a series of potential breeding ponds (located within 500 feet of the existing transmission line corridor) that could support the species.	Spring 2012 (Habitat Assessment) Spring 2013 (Field Surveys)
California Tiger Salamander Habitat Assessment	Habitat assessment for California tiger salamander, based on documented occurrences, habitat surveys, and known species range. Field data was collected by conducting aquatic sampling at a series of potential breeding ponds (located within 1,200 feet of the existing transmission line corridor) that could support the species.	Spring 2012 (Habitat Assessment) Spring 2013 (Field Surveys)
Giant Garter Snake Habitat Assessment	Habitat assessment for giant garter snake, based on documented occurrences, habitat surveys, and known species range. Field data was collected as part of the Wildlife Constraints Assessment.	April 2012

Note:

[1] The initial surveys conducted in 2011 and 2012 only included known project components that had been identified at that time. Supplemental surveys for additional project components were completed in 2013, as needed.

Source: Data compiled by AECOM in 2013

The corridor traverses though urban, agricultural, and natural areas, including rural residential areas, open space, grazing lands, and croplands. Vegetation is dominated mainly by non-native annual grasslands, oak woodlands, and planted crops, including orchards and vineyards. Within the non-native annual grassland are patches of native grasslands as well as seasonal wetlands, freshwater and brackish marsh, and northern hardpan vernal pools. Other vegetation types include ruderal disturbed areas, freshwater and brackish marsh, coyote brush scrub, and riparian forest.

Question 4.4a – Sensitive Species – Less-than-Significant Impact with Mitigation Incorporated

Relevant literature and databases, as well as project-specific surveys and reports, identified a total of 77 special-status species—42 plants and 35 animals—with the potential to occur in the project vicinity.

In addition to Applicant-Proposed Measures (APMs) designed to avoid or reduce impacts on specific species or resources, general measures to be implemented project-wide have also been developed. These measures are intended to avoid, minimize, or reduce impacts on identified special-status and protected resources in the project area. For example: an environmental awareness training program would be provided for all construction and on-site personnel to ensure compliance with all proposed measures and project requirements (APM-GEN-1); a qualified biologist would serve as the on-site biological monitor during construction activities in locations where special-status species or sensitive resources could be affected (APM-BIO-1); work activities and access roads would be confined to designated areas only (APM-BIO-2); equipment would be maintained to prevent or contain leaks (APM-BIO-3); and speed limits would be maintained on unpaved access routes (APM-AQ-2).

Special-Status Plants

Based on the results of the literature and database reviews, field surveys, and familiarity with the regional flora, 94 special-status plant species were considered in the assessment (PG&E 2012). Of these 94 plant species, 52 were determined to have no potential to occur because of the lack of suitable habitat, range restrictions, or elevation restrictions, leaving a total of 42 special-status plant species with suitable habitat in the project area. An overview of CNDDB occurrences within the project vicinity is shown in Attachment E: CNDDB Special-Status Plant Species Occurrences (Confidential). See Attachment G: Special-Status Plants with Potential to Occur in the Project Area for a complete listing.

Of these remaining 42 special-status plant species, 23 are state-listed as endangered, threatened, or rare and/or federally listed as threatened or endangered; and all of the species are California Rare Plant Rank (CRPR) list 1 or 2 species. Results of the botanical survey found that, of the 42 special-status species considered, five are present in the vicinity of project work areas. The remainder of the special-status plant species were determined to have no potential to occur or to have low potential (unexpected) to occur, based on a lack of suitable habitat in project work areas, or because they would have been detectable during the 2011, 2012, or 2013 botanical surveys and were not observed.

The special-status plant species found to be present in the vicinity of project work areas include:

- Sonoma sunshine (*Blemnosperma bakeri*) (federally listed as endangered [FE], State-listed as endangered [SE], CRPR 1B.1)
- Mason's lilaeopsis (*Lilaeopsis masonii*) (State Rare [SR], CRPR 1B.1)
- Baker's navarretia (*Navarretia leucocephala* ssp. *Bakeri*) (CRPR 1B.1)
- Bearded popcorn-flower (*Plagiobothrys hystriculus*) (CRPR 1B.1)
- Oval-leaved viburnum (*Viburum ellipticum*) (CRPR 2.3)

Although all five species were found during project-specific botanical surveys, only three—Mason's lilaeopsis, Baker's navarretia, and bearded popcorn flower—were present in close proximity to project work areas, where impacts could occur. A single population of Mason's lilaeopsis (assumed to be more than 100,000 individuals) occupied the riverbanks and tidal mudflat areas of the Napa River between Towers 112 and 115. In addition, a single population of Baker's navarretia (approximately 8,000 individuals) was recorded within the Remy Preserve, east of Interstate 505 between Towers 5 and 8, in an area grazed by cattle. Construction activities in both of these areas, including the Napa River and Remy Preserve, would be conducted by helicopter, or by foot under the escort of the biological monitor to ensure avoidance of these populations. Therefore, no impact on Mason's lilaeopsis or Baker's navarretia would occur.

During the 2011 surveys, a single population of bearded popcorn flower (approximately 175 individuals) was documented in a disked mesic field immediately west of Interstate 505, south of the access road leading to Tower 9. Although this population was observed in the right-of-way (ROW), approximately 300 feet from the tower, no project-related activities are proposed in this section of the ROW, and use of the nearby existing access road would not affect the species. Therefore, no impact on bearded popcorn flower would occur.

The remaining two species—Sonoma sunshine and oval-leaved viburnum—were observed in the project vicinity:

- A single population of oval-leafed viburnum (approximately 11 individuals) was observed in 2011, at the bottom of a steep canyon, straddling an ephemeral stream in the Napa County portion of the Vaca Mountains.

- A single population of Sonoma sunshine (approximately 75 individuals) was observed in March 2011, in a wet depression in non-native grassland habitat, along an existing dirt road, opposite Bonness Road east of Arnold Drive.

No oval-leafed viburnum is in close proximity to any project work areas. The population of Sonoma sunshine is located approximately 750 feet south of Tower 160; however, no construction activities would occur within 500 feet of this population, and thus direct impacts on individuals or their seed banks are not anticipated. Therefore, no impact on oval-leafed viburnum or Sonoma sunshine would occur.

Critical habitat for Contra Costa goldfields is present in the project area, encompassing Tulucay Substation and the immediate surrounding area. No Contra Costa goldfields individuals were observed in the project area during botanical surveys in 2011, and no suitable vernal pool habitat

is present in the project area that overlaps with Contra Costa goldfields critical habitat. Therefore, no impact on Contra Costa goldfields would occur.

PG&E would implement APM-BIO-4 requiring installation of exclusion flagging as necessary and avoidance of rare plant populations identified during pre-construction surveys in close proximity to construction. Furthermore, PG&E would implement APM-BIO-5, requiring pre-construction surveys before vegetation clearing activities with potential to impact special-status resources and would confine vegetation clearing (e.g., tree removal, tree trimming, and understory vegetation removal) and grading activities to the minimum amount necessary, to avoid impacts on special-status plants. With implementation of these APMs, the impact on special-status plants would be further reduced to a less-than-significant level.

Special-Status Wildlife

Results of the literature and database reviews indicated the potential for 46 special-status wildlife species to occur within the project vicinity. The results of the research and field work conducted for the project found that, of these 46 species, 19 are present or have a high potential to occur, 6 have a moderate potential to occur, and 9 have a low potential to occur within project work areas (PG&E 2011). In addition, 12 special-status wildlife species were determined to have no potential to occur because of range restrictions or a lack of suitable habitat in project work areas. The potential for special-status wildlife species to occur in the project vicinity is described further in Attachment H: Special-Status Wildlife Species with Potential to Occur in the Project Area.

The following 19 special-status wildlife species have a high potential to occur or are known to occur in the project area:

- California freshwater shrimp (*Syncaris pacifica*), federally listed as threatened (FT) and state-listed as threatened (ST)
- Vernal pool fairy shrimp (*Branchinecta lynchi*), FT
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), FT
- Delta smelt (*Hypomesus transpacificus*), FT, SE
- Sacramento splittail (*Pogonichthys macrolepidotus*), SSC
- Steelhead (*Oncorhynchus mykiss irideus*) – Central California coast and Central Valley steelhead Evolutionarily Significant Units (ESU), FT
- California red-legged frog (*Rana draytonii*; CRLF), FT, SSC
- Western pond turtle (*Actinemys marmorata*), SSC
- Golden eagle (*Aquila chrysaetos*), state-listed as fully protected (FP)
- Bald eagle (*Haliaeetus leucocephalus*), SE, FP

- American peregrine falcon (*Falco peregrines anatum*), FP
- Northern harrier (*Circus cyaneus*), SSC
- San Pablo song sparrow (*Melospiza melodia samuelis*), SSC
- Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), SSC
- Swainson's hawk (*Buteo swainsoni*), ST
- Tricolored blackbird (*Agelaius tricolor*), SSC
- White-tailed kite (*Elanus leucurus*), FP
- Western burrowing owl (*Athene cunicularia*), SSC
- Pallid bat (*Antrozous pallidus*), SSC
- Yellow-breasted chat (*Icteria virens*), SSC

The following six special-status wildlife species have a moderate potential to occur in the project area:

- Green sturgeon (*Acipenser medirostris*), FT, SSC
- Chinook salmon (*Oncorhynchus tshawytscha*), FT, ST
- Foothill yellow-legged frog (*Rana boylii*; FYLF), SSC
- American badger (*Taxidea taxus*), SSC
- Salt marsh harvest mouse (*Reithrodontomys raviventris*), SE, FP, federally listed as endangered (FE)
- Western red bat (*Lasiurus blossevillii*), SSC

The following eight special-status wildlife species have a low potential to occur in the project area:

- Conservancy fairy shrimp (*Branchinecta conservatio*), FE
- Vernal pool tadpole shrimp (*Lepidurus packardi*), FE
- Callippe silverspot (*Speyeria callippe callippe*), FT
- California tiger salamander (*Ambystoma californiense*), Sonoma County Distinct Population Segment (DPS), FE, SE; Central California DPS: FT, ST
- Northern spotted owl (*Strix occidentalis caurina*), FT

- California black rail (*Laterallus jamaicensis coturniculus*), ST, FP
- California clapper rail (*Rallus longirostris obsoletus*), FE, SE, FP
- Townsend's big-eared bat (*Corynorhinus townsendii*), SSC

Detailed descriptions of the habitat, distribution, and life history of each of the above federally listed species are provided in the project's Biological Assessment. The remaining, non-federally listed, special-status species are described in the project's Wildlife Constraints Analysis Report. The potential to impact special-status wildlife species with a moderate or greater potential to occur is discussed in the following subsections.

Special-Status Invertebrate Species

Vernal Pool Fairy Shrimp. Vernal pool fairy shrimp occur in the northern vernal pool habitats found in Solano County (USFWS 2005), and six occurrences of vernal pool fairy shrimp have been recorded within a 5-mile radius of the existing transmission line corridor. Vernal pool fairy shrimp are present in the project area adjacent to and between Towers 3 through 9 within the Remy Preserve. Project work areas have been proposed for these locations that avoid all potential aquatic, wetland, and vernal pool habitat.

Impacts on aquatic resources from nearby project work areas would be avoided in most cases, with implementation of the Storm Water Pollution Prevention Plan (SWPPP), as described in APM-HYDRO-01. No suitable habitat for vernal pool fairy shrimp was identified within any of the project work areas or overland access routes. Furthermore, all construction activities within the Remy Preserve would be performed by helicopter, with any ground access to the towers conducted on foot and with a biological monitor present. As described in APM-BIO-14, work exclusionary buffers would be implemented around vernal pools. Therefore, no impact on vernal pool fairy shrimp would occur.

Indirect impacts on vernal pool fairy shrimp in general could occur as a result of ground-disturbing activities in the vicinity of suitable habitat, for example by altering the hydrologic conditions of the area. PG&E does not anticipate conducting major ground-disturbing activities, such as grading, within 250 feet of suitable vernal pool fairy shrimp habitat. Some minor ground-disturbing activities would occur between 200 and 250 feet of suitable vernal pool fairy shrimp habitat outside of the Remy Preserve, during the installation of an H-frame guard structure along Interstate 505. Guard structure installation, which is described in Chapter 3, Project Description, would require minimal ground disturbance. Potential direct and indirect impacts on vernal pools were evaluated as a result of this proposed activity, and because of site-specific conditions, this activity is not anticipated to impact the hydrology of the area and, therefore, is not expected to indirectly affect any nearby vernal pool features or vernal pool fairy shrimp. Attachment I: Vernal Pool Hydrological Impact Assessment Memorandum provides additional information regarding this evaluation. Another proposed guard structure location, over Leisure Town Road outside the Remy Preserve, would be required during construction. This location is between 200 and 250 feet of vernal pool features; however, a bucket truck (or other non-ground disturbing method) could be used to guard the crossing at this location.

Uncontrolled runoff from the two project work areas near vernal pools is the only construction activity that has potential to cause sedimentation of suitable vernal pool fairy shrimp habitat if work site best management practices (BMPs) are not implemented. In accordance with the State Water Resources Control Board's National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, PG&E would implement BMPs included in the project's SWPPP developed for the reconductoring project, per APM-HYDRO-1. These BMPs would prevent sediment and other materials from being transported from project work areas into adjacent waterbodies or streams, including vernal pool features, during the rainy season. BMPs included in the SWPPP would be implemented to control sedimentation, erosion, and prevent any hazardous substances from affecting the water quality in any aquatic resources. No construction activities are expected to permanently alter the hydrology of or introduce contaminants into vernal pool features. With implementation of APM-HYDRO-1, the impact on vernal pool fairy shrimp would be further reduced to a less-than-significant level.

California Freshwater Shrimp. California freshwater shrimp is known to occur in watersheds of Sonoma Creek, the lower Napa River, Tolay Creek, and Petaluma River. In the project area, California freshwater shrimp are known to occur in the portion of Huichica Creek that crosses the existing transmission line corridor between Tower 132 and Tower 133 and approximately 165 feet from a landing zone (Swaim 2011). No work would occur within Huichica Creek, and thus, no impact on California freshwater shrimp would occur.

Construction activities at Towers 132 and 133 and the landing zone in the vicinity of Huichica Creek have the potential to alter water quality through run-off, resulting in potential indirect impacts on California freshwater shrimp. However, because PG&E would implement APM-HYDRO-1, a SWPPP would be designed to control and prevent construction run-off from entering Huichica Creek and other aquatic resources. Furthermore, if construction activities occur in this area during the rainy season, PG&E would implement APM-BIO-6 to further avoid any potential impacts. With implementation of APM-HYDRO-1 and APM-BIO-6, the impact on California freshwater shrimp would be further reduced to a less-than-significant level.

Valley Elderberry Longhorn Beetle. A total of seven documented occurrences of valley elderberry longhorn beetle (VELB) are located in the project vicinity, all of which were recorded east of Napa River, and concentrated in the area around Suisun Valley, Putah Creek, and its tributaries, near the Napa/Solano and Yolo/Solano county borders. All elderberry shrubs suitable for use by VELB in the project area were identified during the June 2011 surveys. Elderberry shrubs that provide suitable habitat for VELB were observed adjacent to Towers 40, 41, 42, and 65. The shrub near Tower 40 contained VELB exit holes, indicating that the species was present in the area at one time. In the Suisun Valley portion of the existing transmission line corridor, an elderberry shrub containing VELB exit holes was identified approximately 200 feet south of Tower 65. This shrub was located in a riparian zone that is associated with one of several ephemeral streams in the area that flow toward Gordon Valley Creek.

PG&E would implement APM-BIO-7 (implementation of PG&E's existing VELB programmatic biological opinion, PG&E 2007) to avoid an impact on VELB through the exclusion of elderberry shrubs from project work areas. If any impact on elderberry shrubs was unavoidable and/or a sign of past or current use by VELB was present, the impact would be documented,

reported, and mitigated as part of PG&E's ongoing VELB programmatic biological opinion and conservation program. Therefore, the impact on VELB would be less than significant with mitigation incorporated.

Special-Status Fish Species

Delta Smelt, Green Sturgeon, Chinook Salmon, and Sacramento Splittail. Delta smelt, green sturgeon, Chinook salmon, and Sacramento splittail have the potential to occur in major waterways occurring in the project area and spanned by the transmission line.

- **Delta Smelt:** CNDDB review showed no delta smelt occurrences within 5 miles of the project area. However, a technical report of fisheries in the Napa River contained two records of delta smelt captured by CDFW biologists: one captured in the main channel of the Napa River in 2001, in close proximity to the existing transmission line corridor, and one adult delta smelt was captured less than 0.5 mile from Tower 115 (USACE 2006). Depending on flow levels, delta smelt are considered to have a high potential to occur in riverine habitats, specifically where the existing transmission line corridor crosses the Napa River.

- **Green Sturgeon:** No CNDDB occurrences of green sturgeon have been recorded in the project vicinity. However, radio-tracking has indicated that green sturgeons move throughout much of the San Francisco Estuary, including San Francisco, San Pablo, and Suisun bays (Kelly et al. 2007). Furthermore, Leidy (2007) reported that adult green sturgeon is likely to disperse and forage in the tidal portions of the Napa River. Therefore, green sturgeon would have a high potential to occur where the existing transmission line corridor crosses the Napa River.

- **Chinook Salmon:** The occurrence of Chinook salmon in the project area is not well documented and no CNDDB records of Chinook salmon occur within 5 miles of the project area. Historically, Chinook salmon may have occurred in Suisun Creek (Leidy et al. 2003, in PG&E 2011); however, whether a current run exists in the Suisun Creek watershed is unknown (Leidy et al. 2003). The only portion of the project area likely to support juvenile or adult Chinook salmon is the Napa River.

- **Sacramento Splittail:** Populations of the Sacramento splittail are found in the San Francisco Bay Delta, Suisun Bay, Napa River, and Petaluma River. Recent sampling efforts have identified Sacramento splittail in several areas of the Napa River (USACE 2006), and the species is assumed to be present along the existing transmission line corridor where it crosses the Napa River.

Potential impacts on these fish species generally may occur through actions that may restrict water flow, degrade water quality, alter parameters beyond fish tolerance levels, impact migration or reproduction, or otherwise result in direct or indirect harm to individuals that are present. Project construction at tower locations along the Napa River would be conducted entirely by helicopter so that, there are no direct impacts on waterways supporting these fish species. Construction related run-off or contamination from approximately two nearby project work areas located in upland areas would be controlled with implementation of the SWPPP, as required by APM-HYDRO-1, to prevent the introduction of contaminants into the Napa River. When work occurs adjacent to aquatic resources, APM-BIO-6 and APM-HYDRO-1would be

implemented to avoid erosion or sediment run-off from the site. With implementation of APMs and conditions from the CDFW Streambed Alteration Agreements, no impact on delta smelt, green sturgeon, Chinook salmon, or Sacramento splittail would occur.

Steelhead, Central California Coast and Central Valley ESUs. The project area overlaps two ESUs[8] for steelhead—the Central California Coast (CCC) ESU and the Central Valley ESU. In the project vicinity, steelhead CCC ESU may occur in streams joining San Francisco and San Pablo bays west of and including the Napa River (Leidy et al. 2003, 2005). The Central Valley ESU includes populations in the Sacramento River and its tributaries in Solano County. Within San Pablo Bay, steelhead make spawning runs in Napa River and Huichica Creek, as well as in Petaluma River, Sonoma Creek, and several tributaries (Leidy, unpublished data, as cited in Leidy 2000); however, almost no data is available on the status in many streams (Leidy 2000). A CNDDB search identified four records of central California coast steelhead in the project vicinity. Streams known to provide habitat for the subspecies in Sonoma County include Adobe Creek in the vicinity of Lakeville Substation, and a tributary upstream of Rodgers Creek that crosses the existing transmission line corridor near Tower 160. In Napa County, one occurrence consisting of two non-spawning adults was recorded in North Slough, which is located on the east side of the Napa River, several miles downriver from the existing transmission line corridor.

A search of the CNDDB yielded no information regarding Central Valley steelhead in the project vicinity; however, other sources document the presence of at least small steelhead runs (PG&E 2011). Green Valley Creek (Tower 84) and Suisun Creek (Tower 73) support small steelhead runs (Leidy 2000). Steelhead is expected to occur periodically in Ulatis Creek (Tower 33), Alamo Creek (Tower 37), Ledgewood Creek (Tower 64), and their tributaries (PG&E 2011) downstream from the project area; however, documented occurrences are limited. Stream and wetland crossing improvements, which include the installation or replacement of culverts and/or placement of rock, would be completed at several intermittent streams or seasonal wetlands. Because project activities at these locations would take place only during the dry season when no water is present (per APM-BIO-17), no direct effects to steelhead would occur. Furthermore, to avoid indirect effects to steelhead as a result of these activities, additional measures would be implemented to ensure that accidental spills do not occur, and that no materials would be placed within a stream channel in a manner that could impede the passage of steelhead (per APM-BIO-3 and APM-BIO-17). Because work within streams and wetlands would be completed during the dry season and because impacts on water quality and potential passage habitat would be avoided, no adverse effects to steelhead would occur as a result of project activities. Construction related run-off or contamination of aquatic resources from nearby project work areas located in upland areas would be controlled with implementation of the SWPPP, as described in APM-HYDRO-1. If construction activities were to occur during the rainy season near streams where steelhead are known or expected to occur, APM-BIO-6 would be implemented. Therefore, the impact on steelhead would be less than significant with mitigation incorporated.

[8] An ESU is a population that is considered genetically distinct, with measurable genetic divergence.

Special-Status Amphibian Species

Two special-status amphibian species—FYLF and CRLF—have the potential to occur in the project area.

Foothill Yellow-Legged Frog. Eight records of FYLF (recorded between 1995 and 2007) were identified within 5 miles of the project. The majority of these are located in Solano County, in portions of streams or creeks that are upstream from the existing transmission line corridor. In Sonoma County, several streams known to be occupied by FYLF either cross the existing transmission line corridor or are hydrologically connected to streams that cross the corridor, including Adobe Creek, Carriger Creek, Fowler Creek, Rodgers Creek, Sonoma Creek, and K Creek (Champlin Creek). Although individuals have been recorded in the project vicinity, riparian stream crossings in Sonoma County generally are of low to moderate quality—no high quality habitat for FYLF is present (PG&E 2011). In Solano County, the nearest occurrence of FYLF to the corridor is within an unnamed tributary to Ledgewood Creek near the Rancho Solano Municipal Golf Course, located approximately 2 miles south of the project area. Gordon Valley Creek crosses the corridor between Tower 65 and Tower 66, and provides similar habitat conditions. In Alamo Creek, records of FYLF occur approximately 1 mile and 1.8 miles northwest of the corridor. Alamo Creek may provide habitat for FYLF. Ulatis Creek crosses the corridor approximately 0.12 mile northeast of Tower 64 and also is known to support the species.

Because FYLF is largely restricted to streams and creeks, it is very unlikely that work in upland areas would impact the species, given the seasonable restrictions against work in the vicinity of water bodies during the rainy season when herptile movement between water bodies occurs. Stream and wetland crossings improvements have the potential to impact the species, if work were to occur at times when water—and thus potentially the species—was present. To protect FYLF from a potential impact, a biological monitor would be present on-site (as described in APM-BIO-1), to monitor construction activities in project work areas overlapping with FYLF suitable habitat. Before performing culvert work within suitable habitat, a preconstruction survey would be conducted for the species, per APM-BIO-5. Furthermore, the biological monitor would halt or redirect activities if there is risk of FYLF impact (see APM-BIO-1). To prevent entrapment of individuals, APM-BIO-8 would be implemented, and no materials containing monofilament netting would be used, only specified erosion control materials as described in APM-BIO-9. Therefore, the impact on FYLF would be further reduced to a less-than-significant level.

California Red-Legged Frog. Based on surveys and sampling conducted in spring 2013, no CRLF were found within any of the approximately 46 locations surveyed in the immediate project vicinity (within the project corridor). Although survey results suggest that aquatic resources nearest to project work areas may not support the species, individuals may migrate from ponds greater than 500 feet into the project area, and thus, their absence from the closest suitable ponds does not eliminate their potential to occur. In the project vicinity, CRLF is most likely to be encountered in Sonoma County, in project work areas located between Tower 157 and Lakeville Substation. The majority of these sites are located less than 2 miles from a recorded CRLF observation, and suitable breeding and non-breeding aquatic habitat occurs within normal dispersal distance of these sites. Although sites located within CRLF Core Area

No. 15[9] in Napa County may also provide upland or dispersal habitat for CRLF, suitable breeding habitat does not occur near this portion of the project area. Although some potential exists for CRLF to occur in the remainder of the project area, the absence of recorded observations of CRLF and the results of assessments and visual surveys suggest that CRLF is highly unlikely to occur in close proximity to other project work areas.

Risk of encountering a CRLF is most likely to occur in the western portion of the project area, from approximately Tower 157 to Lakeville Substation. In this area, suitable CRLF dispersal habitat is present within nearly all of the project work areas, and underground burrows that CRLF may use as retreats are present. Project activities may affect CRLF, if individuals are present in the project work areas during clearing, grading, or when heavy equipment is being used. In areas where rodent burrows or other subterranean retreats are present, CRLF may become crushed or entombed during project-related ground disturbance. The potential for CRLF to be subject to a direct impact would be highest during the rainy season, when CRLF make overland movements between aquatic habitats. Potential also exists for the project to affect CRLF in other portions of the project area, notably in Napa County, where a portion of the project area lies within CRLF Core Area No. 15. Although an impact in this area would be limited to uplands that are separated from the nearest recorded observations of CRLF by a distance of several miles, potentially suitable breeding habitat occurs within dispersal distance of project work areas, and the species may travel overland and into the project area. Overall, the project is anticipated to temporarily impact approximately 51 acres of upland habitat for CRLF. No impact on breeding habitat and no permanent impact would occur. To reduce and minimize the potential impact on CRLF, PG&E would implement APM-BIO-5 (requiring pre-construction surveys and exclusion fencing for CRLF), APM-BIO-8 (to avoid entrapment of CRLF within excavations, and the measures described in the project's Biological Assessment, which were developed in coordination with USFWS to minimize and mitigate any impact on the species. Therefore, the impact on CRLF would be less than significant with mitigation incorporated.

Special-Status Reptile Species

Western Pond Turtle. Occurrences of western pond turtle are found throughout the project vicinity, including in multiple streams and agricultural ponds west of Petaluma; at the southern edge of the City of Sonoma; in the Napa Valley between the Napa River and Highway 12 in a dredge canal tributary to the Napa River, in Tulucay Creek; in North Slough north of the City of American Canyon; and in several agricultural ponds in eastern Napa and western Solano counties. Suitable habitat for western pond turtle was identified during 2011 field surveys, in agricultural ponds located near Towers 62, 119, 128, and 143. Potential aquatic habitat also occurs in Suisun Valley Creek near Tower 73, in Suscol Creek, and the Horseshoe Bend portion of the Napa River. Suitable nesting habitat occurs in various locations throughout the project area, where friable soil and low vegetation are located within a distance of approximately 1,200 feet from aquatic habitat (Storer 1930; Rathbun et al. 1992); however, most nesting probably occurs closer, within approximately 150 feet of water (Holland 1994).

An impact on western pond turtle could occur from any activities that may disturb suitable occupied aquatic or upland habitat. Although no direct impacts on potential pond turtle aquatic habitat are anticipated to occur, impacts on suitable upland habitat, including riparian brush,

[9] Core Areas are designated by EPA for federally listed species.

could affect nesting activities or otherwise impact turtles, if present. To reduce the potential impact on western pond turtle, PG&E would implement APM-BIO-5, which would require conducting preconstruction surveys for this species. Furthermore, only specified erosion control materials would be used, consistent with APM-BIO-9. Therefore, the impact on western pond turtle would be less than significant with mitigation incorporated.

Special-Status Avian Species

Passerine Species. Four special-status passerine species—tricolored blackbird, yellow-breasted chat, saltmarsh common yellowthroat, and San Pablo song sparrow—have the potential to occur in the project area.

- **Tricolored Blackbird:** Tricolored blackbird occurrences have been recorded (between 1992 and 1993) in four locations in the project vicinity. All of these occurrences were recorded within the Napa River marsh system in the southern portion of Napa County. In the project area, tricolored blackbird has potential to occur near the Napa River and, to a lesser degree, within marsh habitats associated with Suscol Creek.

- **Yellow-Breasted Chat:** Portions of the project area in Sonoma County overlap the current known range of yellow-breasted chat; however, it is not likely to breed in Napa or Solano counties (Shuford and Gardali 2008). No records of yellow-breasted chat are found in the project vicinity; however, suitable habitat occurs in the project area at several locations, where streams and riparian vegetation occur in close proximity to or cross the existing transmission line corridor.

- **Saltmarsh Common Yellowthroat:** A total of 18 occurrences (between 1985 and 2004) of saltmarsh common yellowthroat have been recorded in the project vicinity. All occurrences were concentrated along the Napa River, the marshes and sloughs west of the Napa River and north of San Pablo Bay, and within Petaluma Marsh. Saltmarsh common yellowthroat was observed during surveys conducted in January 2013, near the Napa River, and this species is present throughout the Napa River area (PG&E 2013). Suitable habitat for saltmarsh yellowthroat occurs in the vicinity of Tower 185, the pond between Towers 127 and 128, the pond southeast of Tower 125, and freshwater and coastal brackish marsh habitats between Towers 110 and 117.

- **San Pablo Song Sparrow:** Two records for San Pablo song sparrow (recorded between 1939 and 2004) were identified in the project vicinity, both located in tidal marshes along the Napa River south of the project area. The nearest location is at the Fagan Marsh Wildlife Area, located approximately 1.9 miles south of the existing transmission line corridor. San Pablo song sparrow has a high potential to occur in limited portions of the project area, with suitable habitat occurring in the vicinity of the Napa River from Tower 111 to Tower 117.

An impact on tricolored blackbird, yellow-breasted chat, saltmarsh common yellowthroat, or San Pablo song sparrow could result from project construction activities with potential to disrupt active nesting. To avoid any potential impact, avian nesting surveys would be conducted before beginning construction at specific locations along the project corridor, as described in APM-BIO-10. Based on these surveys, appropriate exclusionary buffers would be established around any active nest sites. Further, any nighttime lighting would be minimized and directed away from

active nest location, per APM-BIO-18. Therefore, the impact on tricolored blackbird, yellow-breasted chat, saltmarsh common yellowthroat, or San Pablo song sparrow would be further reduced to a less-than-significant level.

Raptor Species. Seven special-status raptor species—western burrowing owl, Swainson's hawk, northern harrier, white-tailed kite, golden eagle, bald eagle, and peregrine falcon—have potential to occur in the project area. PG&E would construct the project in accordance with PG&E's Avian Protection Plan (APP) and Raptor-Safe Construction and Wildlife Protection standards.

- **Western Burrowing Owl.** A total of 76 records of burrowing owl were identified in the project vicinity between 1988 and 2006, concentrated primarily around the valley floor and grasslands west of Vacaville, the Lagoon Valley between Fairfield and Vacaville, and the Napa River estuarine system. The nearest record of burrowing owl occurs in the immediate vicinity of Tower 10. During 2013 winter field surveys, two wintering burrowing owls and associated occupied burrows were observed in the project area, near Tower 5 and within an area inside Vaca Dixon Substation. The individuals were confirmed to migrate from these areas later in spring 2013, indicating wintering status. No burrowing owls have been detected during the breeding season surveys, indicating that the project area likely only supports wintering owls in limited areas. Grassland habitat occurs intermittently along the existing transmission line corridor, from Vaca Dixon Substation to the Napa River at Tower 112. Breeding season surveys conducted in 2012 indicate that ground squirrel colonies and suitable burrows for burrowing owl occupation are absent from many areas. Burrowing owl suitability often is more prevalent in areas supporting appropriately sized burrows.

  The project has limited potential to affect burrowing owl, as burrow habitat generally is absent from the majority of the project area. Because these conditions could change, based on current distributions of ground squirrel and other small mammal populations, construction activities could affect burrowing owl, if present at the time of construction. To avoid an impact on active burrows, preconstruction surveys, consistent with APM-BIO-5, would be conducted to identify any potential burrowing owl burrows. Owl occurrences detected in the wintering season would also be resurveyed. PG&E would implement APM-BIO-11 before beginning construction activities within burrowing owl habitat. This measure would establish appropriate exclusionary buffers, based on the seasonality of the work, around active burrows. If construction activities are required within these limits while burrows are occupied, a site-specific work plan would be prepared, CDFW would be notified, and work would take place in the presence and at the discretion of a qualified biological monitor. If owls are confirmed near project work areas, implementation of proposed APMs would minimize and avoid effects on burrowing owls. Therefore, the impact on burrowing owl would be less than significant with mitigation incorporated.

- **Swainson's Hawk**. This species is known to occur in two general locations in the project area, with more than 75 occurrences of Swainson's hawks recorded in the project vicinity between 2001 and 2009. The majority of recorded occurrences are located east of Vaca Dixon Substation. However, in general, the eastern portion of the existing transmission line corridor (including Vaca Dixon Substation) encompasses an area of highly suitable Swainson's hawk foraging and breeding habitat. West of Interstate 505, agricultural fields become less common and the quality of Swainson's hawk foraging habitat diminishes as the

corridor enters the Vaca Mountains near Tower 39. Nonetheless, some suitable habitat exists within this portion of the corridor, particularly in the Lagoon Valley area between Fairfield and Vacaville (near Towers 33 through 36 and east of Towers 38 through 48) and in the Suisun Valley (near Towers 70 through 74). Additional suitable habitat is present along the Napa River corridor from approximately Towers 102 to 112 near Tulucay Substation. Although approximately seven Swainson's hawk territories or nest sites were identified in the Vacaville and Napa areas during surveys completed in 2012, occupied nest sites are at distances greater than 0.5 mile from the project area.

The project could have potential impact on Swainson's hawks by disrupting normal nesting activities from the use of helicopters, vehicles, and construction equipment. To avoid any impact on Swainson's hawk, PG&E would implement APM-BIO-12, which proposes to survey for Swainson's hawk during the breeding season before beginning construction. Based on these surveys, appropriate 0.25- to 0.50-mile exclusionary buffer zones would be established for both helicopter and ground-based construction work until the young fledge or the nest is no longer active. Therefore, no impact on Swainson's hawk would occur.

- **Northern Harrier**. Suitable habitat for northern harrier exists within the lowland portions of the project area, including grasslands bordering waterways such as the Napa River. Northern harrier was detected foraging in the project vicinity during helicopter surveys conducted in 2012. A single record of a northern harrier nest was documented in a coastal marsh at Coon Island, approximately 3.5 miles south of the existing transmission line corridor in the Napa River area. In the project vicinity, northern harrier is most likely to be found in treeless habitats that provide adequate prey and suitable perches, including fence posts and shrubs. The valley floor area near Vacaville, the Napa River Valley, and the open agricultural areas in Sonoma County all provide suitable habitat for this species. To avoid potential impact on northern harrier, avian nesting surveys would be conducted in work areas before beginning construction, as described in APM-BIO-10. Based on the survey results, appropriate exclusionary buffers would be established around any active northern harrier nest sites until the young has fledged or the nest is no longer active. Therefore, the impact on northern harrier would be further reduced to a less-than-significant level.

- **White-Tailed Kite**. The year-round species range overlaps with all portions of the project area, and four occurrences of nesting white-tailed kites have been recorded in the project vicinity. White-tailed kite was observed flying or kiting in the project area during golden eagle surveys, conducted in March 2013; however, no nest sites were identified from the air. The species also was observed foraging near the Napa River during surveys for California clapper rail completed in 2013. Thus, white-tailed kite is known to occur in the project area. The nearest record of nesting white-tailed kites is located west of Vacaville, approximately 1.1 mile south of Vaca Dixon Substation. Another record of nesting kites occurs in this vicinity, located approximately 2.1 miles southeast of the existing transmission line corridor. East of Vaca Dixon Substation, a nest was reported approximately 3.4 miles from the corridor. In the Suisun Valley area, an additional nest was detected east of Suisun Creek, approximately 4.8 miles south of the corridor. Suitable nesting and foraging habitat for white tailed kite occurs throughout the project area, with the exception of some vineyard areas in Sonoma County. Potential impacts on this species could result from construction activities that disrupt active nests. To avoid any potential impact on white-tailed kite, preconstruction

avian nesting surveys are planned, as described in APM-BIO-10. Based on these surveys, appropriate exclusionary buffers would be established around any active nest sites. Therefore, no impact on white-tailed kite would occur.

- **Golden Eagle**. One record of an active golden eagle nest is known in the western portion of the project area. In addition, several golden eagle pair territories (six as of March 2013) were known to overlap portions of the project area; however, no nesting has been confirmed. Golden eagle may nest in the project area during project construction. An impact on golden eagle has potential to occur from construction activities that disrupted nesting, such as helicopter work. With implementation of APM-BIO-12, the status of known nest sites would be verified, and any new nest locations would be identified through preconstruction surveys. Any active nests would be surrounded 0.5 mile work exclusion buffer until the young have fledged or the nest is no longer active. Therefore, no impact on golden eagle would occur.

- **Bald Eagle**. In 2013, a bald eagle was observed during helicopter-based golden eagle surveys near the Suisun Reservoir, approximately 0.5 mile north of Tower 78. No nest was observed during the survey, and the nearest documented nest site is approximately 18 miles north of the project area, along Lake Hennessy. Bald eagles typically nest near lakes or reservoirs. PG&E would implement APM-BIO-12 to verify the status of historic nest sites, and any new nest locations would be identified through preconstruction surveys targeting eagle nests. Any active nests detected would be surrounded by a 0.5-mile work exclusion buffer until the young have fledged or the nest is no longer active. Therefore, no impact on bald eagle would occur.

- **Peregrine Falcon**. No CNDDB records of nesting peregrine falcons were found within the project vicinity; however, potential nesting habitat was identified on the rock cliff west of Tower 48. Furthermore, a peregrine falcon was observed perching in the Napa River area, possibly Tower 115, between 2004 and 2006 (PG&E 2011). Peregrine falcons were also observed foraging near the Napa River during surveys for California clapper rail completed in 2013. Thus, the species is known to occur in the project area. Potential impacts on this species could result from construction activities that disrupt active nests. To avoid any potential impact on peregrine falcon, preconstruction avian nesting surveys are planned, as described in APM-BIO-10. Based on these surveys, appropriate exclusionary buffers would be established around any active nest sites. Therefore, no impact on peregrine falcon would occur.

Special-Status Mammal Species

Salt Marsh Harvest Mouse. Seven occurrences of salt marsh harvest mouse have been recorded in the project vicinity, and moderate potential exists for the species to occur in small sections of the project area associated with salt marsh habitats. The recorded occurrences are located south of the project area and are distributed along the north edge of San Pablo Bay, from Petaluma Marsh to the tidal sloughs and marshes along the Napa River. The occurrence nearest to the existing transmission line corridor was recorded in the 1970s, at the Highway 12 bridge river crossing approximately 0.3 mile from the project area, during which time two mice were captured. The nearest occurrence was located in a small pickleweed marsh on the west side of the Napa River, approximately 1.3 miles south of the project area and 0.5 mile north of the confluence with Carneros Creek. Suitable habitat for salt marsh harvest mouse is present within

tidal marsh habitat within and adjacent to the Napa River, between Towers 113 through 115. All construction work at these towers would be performed using helicopters, and no ground disturbance would occur, including no disturbance to salt marsh habitats or associated uplands. Therefore, no impact on salt marsh harvest mouse would occur.

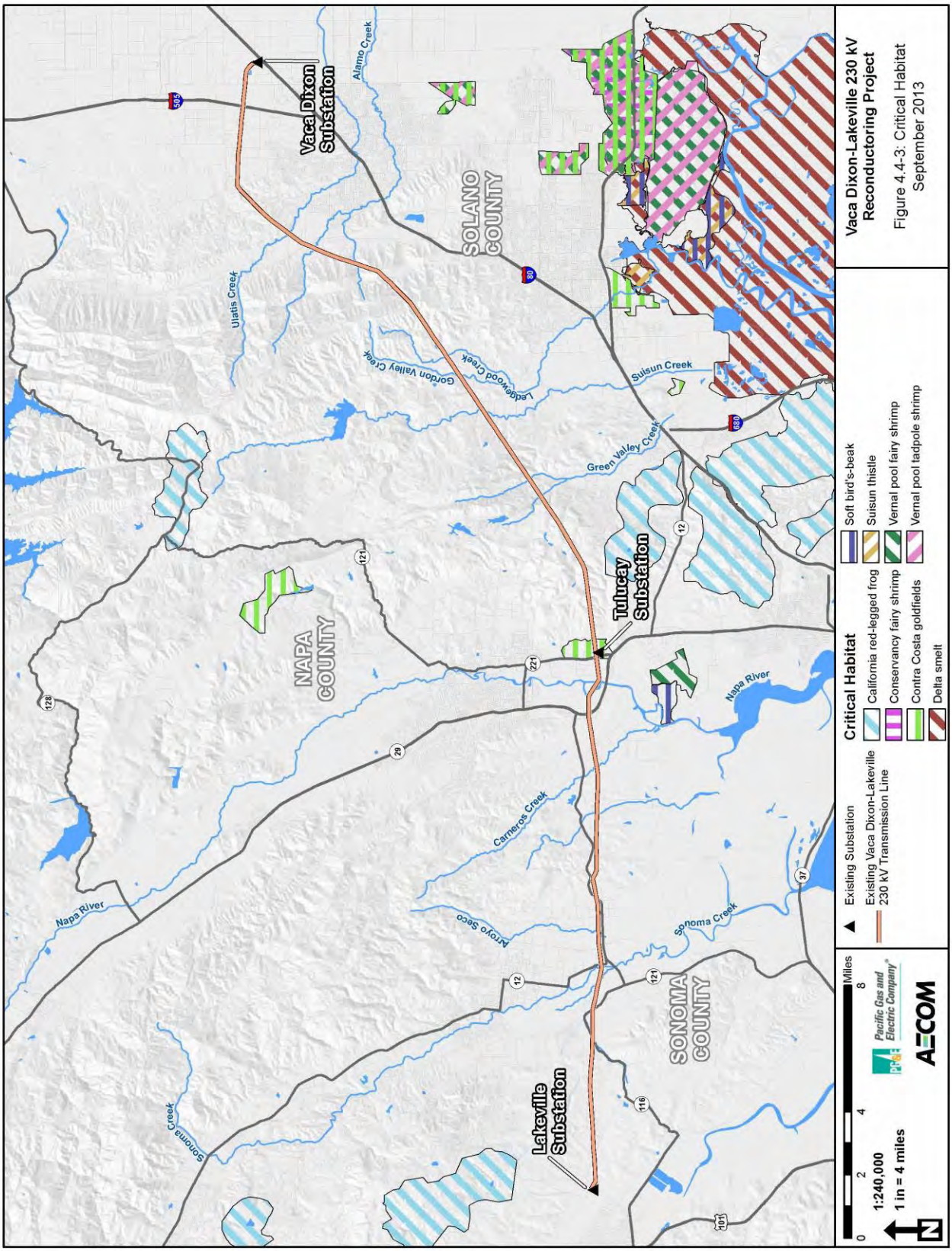
American Badger. American badger resides in a variety of habitat types, including scrub, forest, and primarily grasslands. The species requires friable soils for burrowing and an adequate rodent prey base. Home ranges can be extensive, and minimum habitat patch size for one individual is estimated to be 25 acres (CDFG 2007, as cited in PG&E 2011). Suitable habitat for the species is present throughout the project area, wherever grassland and oak savannah habitat are found. Three historic occurrences have been recorded, with one occurrence recorded within 5 miles of the project area. Although occurrences have not been reported in the project vicinity within Napa and Solano counties, badgers may occur in areas where suitable habitat exists. The species may be affected by construction activities that disturb or otherwise destroy active badger burrows. To avoid an impact on active burrows, PG&E would implement APM-BIO-5, which would include preconstruction surveys for potential burrow sites as well as setting up appropriate exclusionary buffer zones. Therefore, the impact on American badger would be further reduced to a less-than-significant level.

Pallid Bat. A known pallid bat roost site is located at the Saintsbury Winery, approximately 125 feet from Tower 123. An impact on pallid bat may occur from construction activities that disturb or destroy active roost sites or interfere with nocturnal feeding. Pallid bats are structure-roosting; however, snags or rock crevices also may be used. Because the project primarily would be constructed during daylight hours, regular nighttime disturbance to nocturnal feeding is not anticipated. PG&E would implement APM-BIO-13 to identify and then avoid or minimize any impact on unidentified pallid bat roost sites. Further, any nighttime lighting would be minimized and directed away from active roost locations, per APM-BIO-18. Implementation of APM-BIO-13 and APM-BIO-18 would reduce any potential impacts to pallid bat to less than significant with mitigation incorporated.

Western Red Bat. The range of the western red bat encompasses all parts of the existing transmission line corridor. No records of the western red bat were found in the project vicinity; however, suitable western red bat roosting habitat is present within vegetation along riparian corridors. A temporary impact could occur as a result of increased human presence and activity, or through a temporary loss of roosting habitat resulting from vegetation removal. To avoid an impact on western red bat, PG&E would implement APM-BIO-13 to identify active roost sites in vegetation planned for removal and would verify that any bats had vacated that vegetation before its removal. Further, any nighttime lighting would be minimized and directed away from active roost locations, per APM-BIO-18. Therefore, the impact on western red bat would be further reduced to a less-than-significant level.

Critical Habitat

As shown in Figure 4.4–2: Critical Habitat Map, the project corridor traverses through critical habitat for two federally listed species—central California coast steelhead and Contra Costa goldfields (*Lasthenia conjugens*).


Vaca Dixon Substation
Alamo Creek
SOLANO COUNTY
Ulatis Creek
Gordon Valley Creek
Ledgewood Creek
Suisun Creek
Green Valley Creek
Tulucay Substation
NAPA COUNTY
Napa River
Carneros Creek
Arroyo Seco
Sonoma Creek
SONOMA COUNTY
Lakeville Substation
Sonoma Creek
Napa River
Vaca Dixon-Lakeville 230 kV Reconductoring Project
Figure 4.4-3: Critical Habitat
September 2013
Critical Habitat
California red-legged frog
Conservancy fairy shrimp
Contra Costa goldfields
Delta smelt
Soft bird's-beak
Suisun thistle
Vernal pool fairy shrimp
Vernal pool tadpole shrimp
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
0 2 4 8 Miles
1:240,000
1 in = 4 miles
Pacific Gas and Electric Company
AECOM

Contra Costa Goldfields

The existing transmission line corridor crosses through Contra Costa goldfields critical habitat, Unit 3, at State Highway 221, approximately 340 feet east of Tower 106. The project would extend through a total of approximately 0.65 mile of critical habitat between Towers 105 and 110. During the 2011 botanical surveys, no individuals or populations of Contra Costa goldfields were observed in the project area, and no suitable habitat for the species is present within the portions of the project area that overlap critical habitat. While direct impacts on Contra Costa goldfields are not expected, the work could result in indirect impacts resulting from the spread of noxious weeds or other species that could compete with Contra Costa goldfields in nearby area. To reduce any potential impact, PG&E would implement APM-BIO-14 so that weeds are not brought into the area on equipment or in materials. Therefore, the impact on Contra Costa goldfields would be further reduced to a less-than-significant level.

Central California Coast Steelhead

USFWS critical habitat migratory corridors for central California coast ESU steelhead are crossed by the existing transmission line corridor in two general locations: the Napa River and adjacent tributaries, including Suscol Creek, Carneros Creek, and Huichica Creek; and in Sonoma Creek and surrounding tributaries, including Schell Creek, Rodgers Creek, and Fowler Creek. No construction work would occur within segments of streams or rivers designated as critical habitat, although work may occur in streams that support designated critical habitat, upstream of the critical habitat area.

Because in-stream work located upstream of designated critical habitat areas would be completed during the dry season and because impacts on water quality and potential passage habitat would be avoided with implementation of APMs, no adverse impact on critical habitat would occur as a result of project activities. Construction related run-off or contamination of aquatic resources from nearby project work areas located in upland areas would be controlled with implementation of the SWPPP, as described in APM-HYDRO-1. Therefore, no impact on steelhead critical habitat would occur.

Question 4.4b – Sensitive Natural Communities – Less-than-Significant Impact with Mitigation Incorporated

Based on field surveys and desktop level review, 16 natural vegetation communities and three developed habitats were identified in the project area. Of these 16 communities, three sensitive natural communities, as identified by the CDFW, occur in the project area—northern hardpan vernal pool, coastal brackish marsh, and native grassland. The project corridor also crosses several riparian corridors, seasonal wetlands, streams, and other aquatic resources, which may be considered sensitive natural habitat due to their hydrologic function and/or suitability for sensitive species. Any construction activities located near or within sensitive natural communities and habitats would be limited, to the maximum extent feasible, per APM-BIO-14. In addition to these communities, the project also crosses through extensive oak woodlands, which are protected under Senate Bill 1334 and California's Oak Woodlands Conservation Act.

Northern Hardpan Vernal Pool

Northern hardpan vernal pool habitat is located along the existing transmission line corridor within the Remy Preserve and on adjacent parcels between Towers 3 and 11. A small area of northern vernal pool habitat also is present approximately 350 feet southwest of Tower 160. Construction work conducted within the Remy Preserve would be performed with a helicopter or on foot; thus, no ground disturbance affecting vernal pool habitat would occur, per APM-BIO-14. The vernal pool habitat southwest of Tower 160 is greater than 250 feet from any project components, and thus this habitat would not be affected by the reconductoring project. Therefore, the impact would be less than significant with mitigation incorporated.

Coastal Brackish Marsh

Coastal brackish marsh habitat is present in the project area beneath or adjacent to Towers 111 through 115, crossing the Napa River and an adjacent slough. Construction work in this section of the project area would be performed with a helicopter or on foot, and thus no ground disturbance would occur to affect coastal brackish marsh habitat. Therefore, no impact would occur.

Native Grassland

Native grasslands on-site are represented by California oatgrass prairie (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*). These communities are recognized as vulnerable by CDFW. Native grasslands are located in the project area near Towers 110 and 86, and at scattered locations throughout the Vaca Mountains. Temporary impacts on native grasslands would occur at Tower 110, where overland access and project work areas within these habitats would be necessary. At Tower 110, a temporary impact on California oatgrass prairie would occur as a result of temporary work sites staged around the base of the tower, as well as overland access from the adjacent paved road. These impacts would have the potential to reduce the dominance of California oatgrass in this area, and may allow non-native invasive grasses to become more established. To reduce and minimize this impact, PG&E would implement APM-BIO-14, which would confine project work areas to the minimum acreage needed and would implement APM-BIO-18, to control the introduction of noxious weeds into the area. After construction, PG&E would implement APM-BIO-15, to promote site restoration in locations where temporary impacts occurred through reseeding, recontouring, and/or other means. Topsoil would be preserved in this area as well, to promote regeneration of this habitat type. Therefore, the impact would be less than significant with mitigation incorporated.

Sensitive Aquatic and Riparian Habitats

In several locations, including where access roads cross stream or wetland features, the project would require improvements to road crossings, including installing new culverts, replacing existing culverts, and adding rock, rip rap, or fill (dirt and/or gravel), to ensure that they are serviceable during construction and allow for the safe passage of construction vehicles and equipment. A total of 20 road crossing improvement or temporary guard structure locations would be required as part of the project. Work at these locations would result in impacts on seasonal wetlands, streams,[10] and riparian habitat. At Sites 1 through 19, impacts generally would

[10] Streams include intermittent waters, perennial waters, and ephemeral waters

result from installation or reinforcement of culverts or placement of rock rip rap. At one location—Site 20—the use of temporary guard structures consisting of wood poles would result in a temporary fill within a wetland and perennial stream during construction activities. As summarized in Table 4.4-3: Sensitive Aquatic Habitat Impact Totals, a total of approximately 0.14 acre of seasonal wetlands and streams would be permanently affected by road crossing improvements and approximately 0.022 acres would be temporarily affected. A more detailed summary of temporary and permanent impacts by aquatic resource type is provided in Table 4.4-4: Aquatic Resource Impacts by Site. No other aquatic habitat, such as vernal pools, are expected to be temporarily or permanently affected by the project.

In addition to impacts on seasonal wetlands and streams, a total of approximately 0.025 acre of riparian habitat would be permanently affected and approximately 0.017 acre would be temporarily affected as a result of the project. Table 4.4-5: Riparian Habitat Impacts summarizes the acres of impact by riparian habitat type.

Mitigation for permanent impacts is not anticipated to be required because all stream and wetland crossing improvements and maintenance activities would occur along existing access roads that have previously been disturbed. Furthermore, the purpose of the improvements is intended to improve the flow and hydrological function of the existing features, thereby improving site conditions and reducing long-term erosion and sedimentation potential. These improvements would also temporarily and permanently impact a relatively small area and incremental impacts on the features and adjacent habitats at the crossings are expected. Nonetheless, should additional mitigation be warranted, PG&E would coordinate with the State Water Board and other agencies, as needed, to provide or implement appropriate mitigation.

Any temporary impacts on riparian vegetation would be minimized with implementation of APM-BIO-15, and may also include replanting or reseeding in disturbed areas. If replanting is necessary, affected vegetation would be replaced at a 1:1 ratio. Higher replanting ratios may be required on a site-specific level, based on ecological function, by the CDFW Streambed Alteration Agreement. Therefore, the impact would be less than significant with mitigation incorporated.

Oak woodlands are protected under Senate Bill 1334 and California's Oak Woodlands Conservation Act. Tree trimming and removal of oaks within project work areas or along access roads may be necessary in some locations. Up to a total of approximately 0.1 acre of oak woodland habitat would be permanently affected at wetland and steam crossings to facilitate access to project work areas. Up to a total of approximately 12.57 acres of oak woodland habitat would be temporarily affected at other temporary work areas, such as pull sites and tower work areas. Oak woodland habitat types affected would include: blue oak woodland, coast live oak woodland, interior live oak woodland, and valley oak woodland. The impacts on oak trees within these work areas are anticipated to be isolated to individual trees and would not require the removal of substantial tracts of woodland habitats to prepare the areas for construction. To avoid impacts on oak trees, many pull sites and landing zones were specifically sited in open areas that are free of oak trees, to minimize the need for trimming or removal. Because the trimming or removal of oak trees would occur only in isolated locations, spread throughout the entire length of the project corridor, the project would not result in a conversion of oak woodlands that would have a substantial effect on the environment. If mitigation is warranted for impacts to specific

Table 4.4-3: Sensitive Aquatic Habitat Impact Totals

Habitat Type	Total Permanent Impact (acres)	Total Temporary Impact (acres)
Seasonal wetland	0.04	0.019
Streams	0.10	0.003
Total	**0.14**	**0.022**

Source: Data compiled by AECOM in 2013

Table 4.4-4: Aquatic Resource Impacts by Site

Site Number	Aquatic Resource Type	Permanent Impact (acres)	Temporary Impact (acres)
1	Wetland	0	0.016
2	Wetland	0.018	0
3	Intermittent waters	0.014	0
4	Intermittent waters	0.012	0
5	Intermittent waters	0.02	0
6	Intermittent waters	0.007	0
7	Intermittent waters	0.005	0
8	Intermittent waters	0.016	0
9	Intermittent waters	0	0
10	Perennial waters	0.001	0
11	Intermittent water	0.005	0
12	Intermittent waters	0.003	0
13	Intermittent waters	0.006	0
14	Intermittent waters	0.006	0
15	Wetland	0.006	0
16	Wetland	0.006	0
17	Wetland/ephemeral waters	0.006	0
18	Ephemeral waters	0.006	0
19	Wetland	0.006	0
20	Wetland/perennial waters	0	0.006
Total		**0.14**	**0.022**

Source: Data compiled by AECOM in 2013

Table 4.4-5: Riparian Habitat Impacts

Riparian Habitat Type	Permanent Impact (acres)	Temporary Impact (acres)
Riparian woodland	0.019	0.011
Great valley mixed riparian	0.006	0
Central coast riparian scrub	0	0.006
Total	**0.025**	**0.017**

Source: Data compiled by AECOM in 2013

oak trees, it would be developed in coordination with the CDFW before beginning construction. Therefore, the impact on oak woodlands would be less than significant with mitigation incorporated.

Question 4.4c – Effects on Federally Protected Wetlands – Less-than-Significant Impact with Mitigation Incorporated

Approximately six of the 19 crossings improvement locations occur within seasonal wetlands and five of these wetlands would be permanently impacted through the installation of new culverts, replacement or modification of existing culverts, and placement of rock rip rap. The result of the installation of culverts or rocked fords would be a permanent impact on these five discrete locations. These crossing improvements would result in approximately 0.04 acre of permanent wetland fill. These improvements may result in impacts on federally protected wetlands, either through fill of wetlands or through temporary disturbances to water quality. However, because of the small amount of fill occurring over multiple locations, project construction would not result in substantial adverse effects on federally protected wetlands, as defined by Section 404 of the CWA. Furthermore, PG&E would implement APM-BIO-6 to install BMPs such as matting, APM-HYDRO-1 to prepare and implement a SWPPP, and APM-HYDRO-2 to minimize soil disturbance during the wet season and implement post-construction restoration. Therefore, the impact would be less than significant with mitigation incorporated.

To reinforce the stability of Tower 117, new anchors would be installed around the tower, which is located within an upland grassland floodplain adjacent to the Napa River. These anchors would be screwed into the ground with minimal disturbance and secured to the tower. As a result, this work would result in a negligible amount of total permanent disturbance or fill in wetlands. This activity would not result in a substantial adverse effect on the area. PG&E would implement APM-BIO-15, requiring work areas to be restored to preconstruction conditions, and would implement the measures in the SWPPP, per APM-HYDRO-1. Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.4d – Interfere with Native Wildlife Movement – No Impact

Because the project would include the reconductoring of existing overhead transmission lines in an existing corridor and no new permanent roads would be constructed, the project would not result in new permanent barriers within wildlife movement corridors. Because of the nature of

the work, construction activities would occur only at discrete locations along the corridor at any given time and would not result in substantial obstruction of wildlife movement. No construction activities or work areas are located in such as way as to block or significantly restrict movements through connective migratory corridors located between larger areas of habitat.

Migratory corridors for central California coast steelhead are present in the project area in two general locations—the Napa River and adjacent tributaries, including Suscol Creek, Carneros Creek, and Huichica Creek, and in Sonoma Creek and surrounding tributaries, including Schell Creek, Rodgers Creek, and Fowler Creek. South of Tower 84, the project access road crosses two tributaries to Green Valley Creek. Although rock may be added around the top of the existing culvert at this location, changes to the existing fish passage are not anticipated, as the existing culvert would not be modified. PG&E would implement the SWPPP so that the project would not result in additional sources of polluted run-off (see Section 4.8, Hydrology, Water Quality, and Beneficial Uses of Waters of the State). Therefore, no impact would occur.

Terrestrial animals may make diurnal and seasonal movements throughout the project area, travelling between upland and aquatic habitat, and to breeding habitats. Because the project involves the reconductoring of an existing transmission line, the small size of the project work areas, and the temporary nature of project impacts, overland migratory corridors would not be affected, and no impact would occur.

Question 4.4e – Conflict with Local Policies – No Impact

The reconductoring project is not subject to local discretionary permitting or design review. Nonetheless, the project's design and APMs are compatible with the goals for habitat and biological resources of local jurisdictions. Project construction would not conflict with any environmental plans, policies, or regulations adopted by agencies with jurisdiction over local land uses, including the following:

- Resource Chapter of the Solano County General Plan (2012)
- Conservation Element of the Napa County General Plan (2009)
- Open Space and Resource Conservation Chapter of the Sonoma County General Plan (2012)
- Conservation Element of the City of Vacaville General Plan (2012)
- Natural Resources section of the City of Napa General Plan (2009)

No impact would occur from conflicts with local policies.

Question 4.4f – Conflict with Conservation Plan – No Impact

Approximately half of the project area—from Vaca Dixon Substation to Tower 55 and from Tower 64 to Tower 96—is located within the Solano County Water Agency's Draft Multispecies Habitat HCP. However, this HCP only covers the activities of the Solano County Water Agency and, therefore, is not applicable to the project. Thus, project construction would not conflict with provisions of the HCP. The project area does not cross through any other HCP or Natural Community Conservation Plan areas. Therefore, no impact would occur.

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4.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

Table 4.5-1: CEQA Checklist for Cultural and Paleontological Resources

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of an historical resource as defined in Section 15064.5?				☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		☒		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		☒		
d) Disturb any human remains, including those interred outside of formal cemeteries?		☒		

PG&E conducted a cultural resources investigation to identify and record archaeological and built environment resources in the project area (including along the existing transmission line corridor or near access roads, drainage crossing improvement areas, and helicopter landing zones); evaluate archaeological and built environment resources within the existing transmission line corridor for their potential eligibility for listing in the National Register of Historic Places and the California Register of Historical Resources (CRHR); and identify methods for avoiding impacts to all resources within the existing transmission line corridor. The information and analysis in this section are drawn from the following technical reports:

- Vaca Dixon-Lakeville 230 kV Reconductoring Project, Sonoma, Napa, and Solano Counties: Historical and Architectural Investigations for the Transmission Lines and Lakeville Substation
- Vaca Dixon-Lakeville 230 kV Reconductoring Project, Sonoma, Napa, and Solano Counties: Paleontological Resources Investigations Report
- Vaca Dixon-Lakeville 230 kV Reconductoring Project, Sonoma, Napa, and Solano Counties: Archaeological Survey Report
- Draft Addendum to Archaeological Survey Report: Vaca Dixon-Lakeville 230 kV Reconductoring Project
- Vaca Dixon-Lakeville 230 kV Reconductoring Project, Sonoma, Napa, and Solano Counties: Addendum to Paleontological Resources Investigations Report

The following activities were conducted as part of the analysis:

- A cultural resources records search at the Northwest Information Center of the California Historical Resources Information System (the search area included a 0.25-mile-wide [0.4-kilometer-wide] portion of the existing transmission line corridor, as well as project-related access roads, drainage crossing improvement areas, and potential helicopter landing zones)
- Consultation with the Native American Heritage Commission and Native American groups and individuals
- A review of survey and site location maps
- A field survey of the existing transmission line corridor, project work areas, access roads, and drainage crossing improvement areas, as well as a 200-foot buffer around access roads and drainage crossing improvements
- A review of existing documentation relevant to the project
- A review of available geological and paleontological literature and geologic maps
- An online fossil locality search in the University of California Museum of Paleontology (UCMP) database

On October 14 through 16, 20 through 23, and 27 through 30, 2011, archaeologists who met the U.S. Secretary of the Interior's professional qualification standards for archaeology conducted an intensive survey of the existing transmission line corridor for cultural resources. The survey was conducted in parallel transects at intervals with a maximum width of approximately 65 feet (20 meters) across the corridor, and near access roads and helicopter landing zones. The archaeologists surveyed approximately 32.75 miles (82 percent) of the 40-mile-long corridor. Approximately 7 miles of the corridor were not surveyed because of steep terrain or access issues, or both. The portions of the corridor that were not surveyed are located in areas of low sensitivity for the presence of cultural resources because of the terrain and typical prehistoric and historic land use patterns in the area. The areas not surveyed are located in the Vaca Mountains at the eastern end of the existing transmission line corridor. In December 2011, Cardno ENTRIX (2012b) conducted a field survey of the project work areas for paleontological resources and a review of the UCMP database.

The 2011 field survey resulted in the identification of seven newly recorded resources, including two historic-period sites, two isolated prehistoric artifacts, and three built environment resources within the existing transmission line corridor or near access roads and helicopter landing zones. The sites/isolates included a double-row linear rock feature (Solano County), a historic rock fence indicating the alignment of a property boundary (Solano County), a groundstone fragment (Napa County), and basalt flake (Napa County). The two isolates (VDL-Iso-1, the basalt flake, and VDL-Iso-2, the groundstone fragment) do not qualify as historical resources, as defined in Section 15064.5 of the California Code of Regulations, and therefore, are not discussed further in this analysis. The built environment resources include the Vaca-Lakeville No. 1 Transmission Line, Tulucay-Vaca Transmission Line, and Lakeville Substation. The records search also identified 51 previously recorded sites and features (21 prehistoric and 30 historic-period sites/features, including historical roads, bridges, railroads, farming related features, milling features, and lithic scatters) within a 0.25-mile (0.4 kilometer) corridor surrounding and

including the existing transmission line corridor. Nineteen of the 51 previously recorded sites/features were located within the existing transmission line corridor or near access roads and helicopter landing zones. These 19 recorded sites and features include a midden site, a mortar site, a fire-affected rock, six transportation-related resources, two water-related resources, seven ranch-related resources, and one transmission tower.

On July 10 through July 13, 2013, AECOM conducted an updated records search at the NWIC, as well as an intensive pedestrian survey of the project work areas that were not previously surveyed. The supplemental survey included work areas, access roads, and drainage crossing improvement areas, as well as a 25-foot buffer around access roads and a 200-foot buffer around drainage crossing improvements. The survey was conducted in transects spaced 15 meters (50 feet) apart. In areas where access was not possible, a cursory survey was conducted from publicly accessible areas, when feasible (AECOM 2013a).

The updated records search and field survey resulted in the identification of one previously unidentified archaeological resource and four previously identified resources, in addition to seven isolated artifacts. The isolates do not qualify as historical resources, as defined in Section 15064.5 of the California Code of Regulations, and therefore, are not discussed further in this analysis. The unidentified resource (VDL-1) consists of the remnants of an historic-era horse-drawn farm wagon. The four previously identified resources include a site (P-48-000164 [CA-SOL-331/H]) consisting of historic-era ranching features and a prehistoric component consisting of a light obsidian lithic scatter; a site (P-48-000167 [CA-SOL-334]) containing midden, basalt, chert, and obsidian debitage, flake tools, and fire-affected rock; a shell midden (P-49-000195 [CA-SON-223]) containing obsidian artifacts, chert artifacts, fire-affected rock, faunal remains, and possibly human remains; and a railroad grade (P-49-002896). Site P-48-000167 was determined to be ineligible for a National Register of Historic Places (NRHP) listing and was listed as such in the archaeological Determinations of Eligibility in 2010. The remaining sites have not been evaluated for eligibility for listing in the NRHP or the CRHR, and therefore, it is unknown if any may be historic properties (AECOM 2013a).

In summary, surveys conducted in 2011 and 2013 identified six newly recorded features/sites (including three built environment resources; not including isolates) and 23 previously recorded features/sites in the transmission line alignment or near access roads, helicopter landing zones, work areas, and drainage crossing improvement areas. Because of the sensitive nature of cultural sites, complete results of the records searches and cultural resources investigations—including site records—are on file at PG&E and have not been included as an attachment to this analysis.

The field survey for paleontological resources did not uncover any evidence of fossil resources within the existing transmission line corridor. Based on the results of the UCMP database search and the field survey, most rock formations were found to be of low paleontological sensitivity. However, the Pleistocene-age alluvial deposits were determined to be of high paleontological sensitivity.

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on cultural and paleontological resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis

is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, as detailed in Chapter 3, Project Description.

Question 4.5a – Historical Resource Change – No Impact

A record search and field surveys of the existing transmission line corridor were conducted to identify built environment resources, which are broadly considered to be resources listed or eligible for listing in national, state, and local registers; or an object, building, structure, site, area, place record, or manuscript determined to be historically significant.

The existing transmission line corridor includes the Vaca-Lakeville No. 1 Transmission Line, Tulucay-Vaca Transmission Line, and Lakeville Substation. All three resources were constructed in 1956. Cultural resource specialists inventoried and evaluated these resources and found that none appear to meet the criteria for listing in the CRHR because of a lack of historical and architectural significance. Because none of these resources appear to meet CRHR eligibility, they are not considered historical resources according to the criteria set forth in CEQA. Accordingly, no built environment historical resources are located in the existing transmission line corridor and no impact would occur.

Question 4.5b – Archaeological Resource Change – Less-than-Significant Impact with Mitigation Incorporated

Of the 29 archaeological resources located in the existing transmission line corridor (or near access roads, helicopter landing zones, or work areas), one resource (P-49-000195) is within the immediate vicinity of tower sites or project work areas (e.g., pull sites). The remaining 28 resources are located outside of project work areas and are unlikely to be affected by construction activities. All 29 sites are located in areas where project construction activities could be planned to avoid each site if APM-CU-1, which would require archaeological site avoidance and outline steps to clearly mark project work area limits during construction to avoid inadvertent damage of sites, was implemented. PG&E would also implement APM-GEN-1, which would require construction workers to receive training regarding the protection of archaeological resources, as well as procedures to be followed if an archaeological resource is encountered during ground-disturbing activities. Therefore, the impact would be less than significant with mitigation incorporated.

In addition to the 29 sites identified within the existing transmission line corridor, previously undiscovered or unknown cultural remains may exist in the project area and may be encountered or uncovered during project construction. APM-CU-2 states that if cultural resources are inadvertently discovered during project construction, all activities would be halted within 100 feet of the discovery and a PG&E cultural resources specialist would be contacted to assess the significance of the find. PG&E would implement APM-CU-1 and APM-CU-2 to avoid potential impacts on these resources. Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.5c – Paleontological Resource Destruction – Less-than-Significant Impact with Mitigation Incorporated

The Paleontological Resources Investigations Report prepared for the reconductoring project indicates that most of the existing transmission line corridor, including access roads and helicopter landing zones, is underlain by rock formations of low paleontological sensitivity. However, Cardno ENTRIX (2012b) did not include a sensitivity determination for those portions of the corridor that are underlain by Pleistocene alluvial deposits. A search of the UCMP database performed by AECOM (UCMP 2013) indicated there are 10 vertebrate localities that have yielded Pleistocene-age land mammals within Pleistocene alluvium in Solano County, nine localities in Sonoma County, and no localities in Napa County. Pleistocene alluvial deposits throughout northern California are known to contain the remains of land mammals such as sabre-toothed cat, mammoth, horse, camel, antelope, and hundreds of other species. Therefore, the Pleistocene alluvium is considered to be a paleontologically sensitive rock formation. However, because the work associated with the reconductoring project would include minimal to no ground-disturbing activities, the project would be unlikely to have an adverse effect on unique paleontological resources. Furthermore, in the event that any paleontological resources are encountered during ground-disturbing activities, PG&E would implement APM-CU-3, which would require halting work within 50 feet of the resource, an evaluation of the resource by a paleontologist, and implementing a paleontological resources treatment plan (if warranted, as determined by the paleontologist). Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.5d – Human Remains Disturbance – Less-than-Significant Impact with Mitigation Incorporated

Evidence exists that human remains may be located in the project area and unknown prehistoric burials may be uncovered during project construction. California law recognizes the need to protect interred human remains, particularly Native American burials and associated items of patrimony, from vandalism and inadvertent destruction. APM-CU-4 would require treatment of human remains in accordance with state laws and regulations, and states that if any suspected human remains are inadvertently discovered during project construction, all activities would be halted within 100 feet of the discovery and a PG&E cultural resources specialist would be contacted to assess the find. If the remains are determined to be human, the county coroner, per Section 7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (NAHC) would also be contacted. The NAHC would assign a Most Likely Descendant, who would make recommendations regarding the treatment and disposition of the remains. Therefore, the impact would be less than significant with mitigation incorporated.

4.5.1 REFERENCES

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4.6 GEOLOGY AND SOILS

Table 4.6-1: CEQA Checklist for Geology and Soils

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			☒	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?[11]			☒	
ii) Strong seismic ground shaking?			☒	
iii) Seismic-related ground failure, including liquefaction?			☒	
iv) Landslides?			☒	
b) Result in substantial soil erosion or the loss of topsoil?		☒		
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			☒	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			☒	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on geology and soils resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

[11] Refers to California Geological Survey (CGS) Special Publication 42 (CGS 2007).

Question 4.6a – Human Safety and Structural Integrity

i. Earthquake Fault Rupture – Less-than-Significant Impact

The existing transmission line corridor crosses Alquist-Priolo earthquake fault zones at two locations: Rodgers Creek Fault Zone, just east of Petaluma in Sonoma County; and Green Valley Fault Zone, near Valley End Road in Solano County. PG&E has evaluated the existing tower footings and has confirmed that only one would require additional reinforcement to accommodate the project's cage-top extensions. Although the reconductoring project would be constructed in areas subject to fault rupture, the installation of new conductor and cage-top extensions would not increase the risk of loss, injury, or death from known earthquake faults. The new tubular steel pole to be installed in Tulucay Substation would not be located in a fault zone. Therefore, the impact would be less than significant.

ii. Strong Seismic Shaking – Less-than-Significant Impact

The existing transmission line corridor is located in a seismically active region. Faults in the vicinity of the existing transmission line corridor, including the Rodgers Creek, Green Valley, San Andreas, West Napa, Great Valley, and Hayward faults, have maximum moment magnitudes ranging from 6.5 to 7.6. Ground motions from seismic activity can be estimated by probabilistic method at specified hazard levels using a computer model. These ground motions are expressed as a fraction of the acceleration of gravity (g) with a 10 percent probability of being exceeded in 50 years. According to the CGS Probabilistic Seismic Hazards Assessment Model, this value would be 0.59 g at the location where the existing transmission line corridor crosses the Green Valley Fault (near Valley End Road in Solano County). Near the point where the corridor crosses the Napa River in Napa County, the peak ground acceleration would be 0.432 g on firm or soft rock, and 0.461 g on alluvium. Near the point where the corridor crosses the Rodgers Creek Fault in Sonoma County (east of Petaluma), the peak ground acceleration would be 0.636 g.

PG&E has evaluated the existing tower footings and has confirmed that only one would require additional reinforcement to accommodate the project's cage-top extensions. Although the reconductoring project would be constructed in areas subject to strong seismic shaking, the installation of the new conductor and cage-top extensions would not increase the risk of loss, injury, or death from strong seismic shaking. Therefore, the impact would be less than significant.

iii. Ground Failure – Less-than-Significant Impact

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. Low-lying areas along the existing transmission line corridor, especially areas near waterways such as Petaluma Creek, Sonoma Creek, and Napa River, potentially could be subject to soil failure and liquefaction during earthquakes. Although the reconductoring project would be constructed in areas subject to seismic-related liquefaction and ground failure hazards, installing the new conductor and cage-top extensions on existing structures would not increase the risk of loss, injury, or death from liquefaction or ground failure compared to the risk for existing structures. Therefore, the impact would be less than significant.

iv. Landslides – Less-than-Significant Impact

The existing transmission line corridor passes through and near mapped landslide hazard areas. Although published landslide hazard mapping is only available for a portion of the corridor, similar hazards from unstable materials or soils likely would be present in similar terrains on other portions of the existing transmission corridor. Installation of cage-top extensions (where required) and new conductors on the existing structures would not change their susceptibility to damage from landslide beyond the existing condition of the transmission line. PG&E would limit minor grading for helicopter landing zones and access road reestablishment in areas that would be susceptible to landslides. Potential landslide impacts would also be minor because standard PG&E construction practices would be incorporated, including the use of compacted fill material or binding agents in localized areas of unstable soils and the monitoring of slopes affected by construction so that they are maintained in stable condition. Therefore, the impact would be less than significant.

Question 4.6b – Soil Erosion or Topsoil Loss – Less-than-Significant Impact with Mitigation Incorporated

Installation of the new tubular steel pole within Tulucay Substation would entail excavation for a new concrete footing. Soils in Tulucay Substation include Coombs gravelly loam (2 to 5 percent slopes) and Hambright-Rock outcrop complex (30 to 75 percent slopes). These soils have low to moderate wind and/or water erosion potential. In addition, minimal grading and/or scraping and vegetation clearing may be required to establish crane pads, helicopter landing zones, pull sites, and access roads. Small, temporary stockpiles of excavated dirt may be located near the excavations for the guard structures and snub poles, and these would be used to backfill the holes for these structures, after construction is completed. Stockpiles would be located away from and/or downgradient from waterways, and other sediment control best management practices (BMPs) would be developed and implemented as described in APM-HYDRO-1: Stormwater Pollution Prevention Plan, to manage temporary stockpiles. Construction debris would be transported on a line truck with a trailer to an area service center as needed for recycling or disposal.

Various overland access routes would be used for tower and/or mid-span access. Use of overland access routes will be limited and the duration of use will be relatively short term in nature; however, repeated project-related use of overland access routes may result in the exposure of highly erodible soils. In the event that highly erodible soils are exposed along overland access routes, PG&E would implement a restoration plan, as described in APM BIO-15. The plan would include measures to stabilize, hydroseed, and/or revegetate exposed soil, thereby avoiding increased erosion potential. Because of the limited extent of earth-disturbing activities and the limited nature of the project construction, substantial erosion or loss of topsoil is not expected to occur. Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.6c – Geologic Unit Instability – Less-than-Significant Impact

As previously discussed, the effects of seismic activity have been taken into account in the design of the towers. Installation of cage-top extensions (where required) and new conductors would not change the susceptibility of existing structures to damage from landslide, lateral spreading, subsidence, liquefaction, or collapse beyond the existing condition of the transmission

line. PG&E would limit minor grading for helicopter landing zones and access road reestablishment in areas that are susceptible to landslides. Potential impacts associated with geologic slope instability would also be minor because standard PG&E construction practices would be incorporated, including the use of compacted fill material or binding agents in localized areas of unstable soils and the monitoring of slopes affected by construction so that they are maintained in stable condition. Therefore, the impact would be less than significant.

Question 4.6d – Expansive Soils – Less-than-Significant Impact

Expansive soils are composed mainly of clays that greatly increase in volume when saturated with water and shrink when dried. The potential for soil to undergo shrink and swell is greatly enhanced by the presence of a fluctuating, shallow groundwater table. Several soil types underlying the existing transmission line corridor have a high shrink-swell potential, meaning that they have high clay content and, therefore, would be capable of exerting substantial expansion pressures on the existing tower foundations. However, these expansion pressures would not differ from those currently present. Installation of the new tubular steel pole within Tulucay Substation would require construction of a concrete pier, with a footing diameter of approximately 4 to 10 feet and a depth up to 24 feet. Soils in Tulucay Substation have low- to moderate shrink-swell potential and are not considered to be expansive soils. Therefore, the impact would be less than significant.

Question 4.6e – Septic Suitability – No Impact

The reconductoring project would not include a wastewater disposal or treatment component. Therefore, no impact would occur.

4.6.1 REFERENCES

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4.7 HAZARDS AND HAZARDOUS MATERIALS

Table 4.7-1: CEQA Checklist for Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		☒		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		☒		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				☒
d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?				☒
e) For a project within an airport land use plan or within two miles of a public airport or public use airport for which such a plan has not been adopted, result in a safety hazard for people residing or working in the project area?		☒		
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			☒	
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fire, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?		☒		

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. PG&E would continue to follow its existing safety and environmental procedures for operation and maintenance of the line, including managing vegetation to prevent fires. As such, impacts related to hazards and hazardous materials resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca

Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Before beginning project construction, PG&E would prepare a Job Hazards Analysis as part of the project's Health and Safety Plan. In addition, PG&E would implement Applicant-Proposed Measure (APM)-HYDRO-1, which would require PG&E to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), which would include best management practices (BMPs) to address spill prevention and response, as required by the General Construction Storm Water Permit. PG&E would not expect to store more than threshold quantities, as defined by California Health and Safety Code Sections 25503 and 25505, of oils and other hazardous materials at any project construction yards or work areas; however, PG&E would prepare a Hazardous Materials Business Plan in the event that storing more than the threshold quantities of hazardous materials was required to accommodate construction activities. Project work conducted at PG&E's existing substations would follow the existing plans that have been established for those facilities. PG&E crew members and licensed contractors employed for the project would be trained and certified on the topics contained in these plans before conducting construction activities.

Question 4.7a – Hazardous Material Transport, Use, or Disposal – Less-than-Significant with Mitigation Incorporated

Project construction activities generally would not pose a hazardous materials risk; however, construction equipment would require refueling and periodic maintenance. Routine transport, use, and disposal of hazardous materials—such as fuels, lubricating oil, and hydraulic fluid—during construction potentially could result in releases of these materials. However, these activities would be conducted in accordance with standard construction BMPs, as identified in the SWPPP (see APM-HYDRO-1). Proper handling of hazardous materials and spills would occur in accordance with the applicable laws and regulations provided in the California Health and Safety Code and California Code of Regulations. In addition, APM-HAZ-1 would minimize the project's potential impact related to hazardous materials transport, use, and disposal by requiring PG&E to use standard operating procedures for storage, refueling, and maintenance of helicopters, as well as for construction vehicles and equipment, during project implementation. Furthermore, PG&E would meet all California Division of Occupational Safety and Health (Cal/OSHA) workplace safety standards. Therefore, the impact would be less than significant with mitigation.

Question 4.7b – Reasonably Foreseeable Upset and Accident Conditions – Less-than-Significant with Mitigation Incorporated

As discussed previously, the project's construction activities would not pose a hazardous materials risk. All required refueling and maintenance, as well as containment and treatment of any accidental spills or leaks, would be conducted in accordance with standard construction BMPs. The volume of hazardous materials that would be used during construction would be relatively small, and all spills would be controlled and contained immediately.

APM-HAZ-1 would minimize the project's potential impact related to reasonably foreseeable upset and accident conditions by requiring that PG&E use standard operating procedures for

storage, refueling, and maintenance of helicopters, as well as for construction vehicles and equipment, during project implementation. Furthermore, PG&E would meet all Cal/OSHA workplace safety standards. The impact would be less than significant with mitigation.

Question 4.7c – Hazardous Substances in Close Proximity to Schools – No Impact

No existing or proposed schools are located within 0.25 mile of the existing transmission line corridor (Napa County Office of Education 2009, Solano County Office of Education 2012, Sonoma County Office of Education 2012). Therefore, no impact would occur.

Question 4.7d – Existing Hazardous Materials Sites – No Impact

The existing transmission line corridor crosses within 100 feet of a leaking underground storage tank site located at 22725 8th Street in Sonoma, and within 100 feet of a permitted underground storage tank located at 22675 8th Street East in Sonoma. Based on a review of the California Department of Toxic Substances Control's EnviroStor database and State Water Resources Control Board's GeoTracker database (DTSC 2007, State Water Board 2012), the project area is not known to contain a hazardous materials site. Therefore, no impact would occur.

Question 4.7e – Public Airport Hazards – Less-than-Significant Impact with Mitigation Incorporated

Five airports are located within 2 miles of the existing transmission line corridor: Petaluma Municipal Airport, Sonoma Skypark Airport, Sonoma Valley Airport, Napa County Airport, and Nut Tree Airport. During the reconductoring project, 39 towers would be raised by a maximum of 16.5 feet. Additionally, one replacement of an existing light-duty steel (LDS) pole with a tubular steel pole (TSP) is proposed as part of the project. The new TSP would be the same height as the existing LDS pole and would be located within the existing footprint of Tulucay Substation. No new towers would be installed as a part of the reconductoring project. Any potential aviation safety hazards already exist and are being properly managed as part of the operation of the existing transmission line.

Helicopter flight paths generally would be limited to the existing transmission line right-of-way and project-specific landing zones. Helicopter use would be in accordance with all applicable federal, state, and local aviation rules and regulations, and would not create any new hazards.

Based on a review of the Federal Aviation Administration's (FAA) Notice Criteria Tool, several towers proposed to be raised would exceed the Notice Criteria specified in FAA Regulations and Title 14 CFR, Section 77.9. PG&E has submitted the required Notice of Proposed Construction and Alteration Application to the FAA for any towers that would be raised and would exceed the Notice Criteria. As described in APM-TRA-1, PG&E would implement any measures required by the FAA in response to the Notice Criteria, and PG&E would coordinate with local airports regarding helicopter operations and flight plans during project construction. Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.7f – Private Airstrip Hazards – No Impact

The existing transmission line corridor is not located within 2 miles of any known private airstrips. Therefore, no impact would occur.

Question 4.7g – Emergency Evacuation and Response Plan Interference – Less-than-Significant Impact

Construction of the reconductoring project would necessitate temporary road closures on major roadways, typically very short in duration (e.g., less than one-quarter of an hour), to install netting for guard structures. However, these temporary road closures would proceed in accordance with California Department of Transportation (Caltrans) requirements and local jurisdictional regulations. PG&E would comply with Caltrans guidelines and applicable city and county policies for all locations of potential lane closures or width reductions and would obtain all necessary transportation and/or encroachment permits from local jurisdictions and Caltrans, as identified in Table 3-3: Required Permits and Approvals. Thus, the reconductoring project would not impair the implementation of or physically interfere with an adopted emergency response plan. Therefore, the impact would be less than significant.

Question 4.7h – Wildland Fires – Less-than-Significant Impact with Mitigation Incorporated

The existing transmission line corridor crosses open grass and oak woodland areas that are susceptible to wildland fires. Approximately 23 miles of the corridor crosses an area defined by the California Department of Forest and Fire Protection (CALFIRE) as a moderate fire hazard zone, and 9 miles of the corridor crosses an area that is defined by CALFIRE as a high fire hazard zone (CALFIRE 2012). Heat or sparks from construction vehicles or equipment would have the potential to ignite dry vegetation and could cause a fire. As described in APM-HAZ-2, PG&E would implement standard fire prevention procedures, thereby reducing potential effects related to wildland fires. Therefore, the impact would be less than significant with mitigation incorporated.

4.7.1 REFERENCES

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4.8 HYDROLOGY, WATER QUALITY, AND BENEFICIAL USES OF WATERS OF THE STATE

Table 4.8-1: CEQA Checklist for Hydrology, Water Quality, and Beneficial Uses of Waters of the State

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?		☒		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		☒		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?		☒		
e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?		☒		
f) Otherwise substantially degrade water quality?				☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				☒
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				☒
j) Cause inundation by seiche, tsunami, or mudflow?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on hydrological resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, as detailed in Chapter 3, Project Description.

Several drainages, wetlands, and ponds are present in the vicinity of project work areas. Major hydrological resources are shown in Attachment A: Project Route Maps.

4.8.1 REGULATORY BACKGROUND

4.8.1.1 Federal

Clean Water Act Sections 401 and 404

Waters of the United States are subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the federal Clean Water Act (CWA). Section 404 regulates the discharge of dredged or fill material into waters of the United States. Waters of the United States include waters used in interstate or foreign commerce; interstate waters and wetlands; other waters, such as lakes, rivers, streams, wetlands, and sloughs that could be used for interstate or foreign commerce; impoundments of water; tributaries of previously mentioned waters; the territorial seas; and wetlands adjacent to previously mentioned waters. The limits of non-tidal waters extend to the ordinary high-water mark or to the limit of adjacent wetlands. In general, ditches excavated on dry land that do not convey flows from historical streams are considered non-jurisdictional as determined by USACE on a case-by-case basis. A CWA Section 404 permit is required for project construction activities involving excavation of, or placement of fill material into, waters of the United States.

CWA Section 401 mandates that states certify that projects subject to federal permits meet state water quality standards. In California, the regional water quality control boards (RWQCBs) and the State Water Resources Control Board (State Water Board) issue such certifications. For any project affecting a water of the United States, a water quality certification is required. The project falls within the jurisdiction of two RWQCBs—the San Francisco Bay RWQCB and the Central Valley RWQCB.

Clean Water Act Section 303(d)

CWA Section 303(d) requires states, territories, and authorized Tribes to develop a list of water quality–limited segments that do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law further requires that these jurisdictions establish priority rankings for waters on the lists and develop action plans, called total maximum daily loads, to improve water quality (State Water Board 2012). The State Water Board and RWQCBs implement this federal regulation in California.

Clean Water Act Section 402

Under CWA Section 402, the National Pollutant Discharge Elimination System (NPDES) controls water pollution by regulating point sources of pollution to waters of the United States.

The State Water Board administers the NPDES permit program in California. Projects that disturb 1 or more acres of soil must obtain coverage under the state NPDES General Permit for Discharges of Storm Water Associated with Construction Activity. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and implemented for each project covered by the general permit. The SWPPP must include best management practices (BMPs) that are designed to reduce potential impacts on surface water quality during project construction and operation.

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) is responsible for determining flood elevations and floodplain boundaries based on USACE studies. FEMA is also responsible for distributing the flood insurance rate maps used in the National Flood Insurance Program. These maps identify the locations of special flood hazard areas, including 100-year floodplains. FEMA allows non-residential development in the floodplain; however, construction activities are restricted in flood hazard areas, depending on the potential for flooding in each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations. Those regulations enable FEMA to require municipalities participating in the National Flood Insurance Program to adopt certain flood hazard reduction standards for construction and development in 100-year floodplains.

Rivers and Harbors Appropriation Act Section 10

Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S. Code Section 401 et seq.) makes it unlawful to obstruct or alter a navigable river or other navigable water of the United States. Construction, excavation, or deposition of materials in, over, or under such waters, or any work that will affect the course, location, condition, or capacity of those waters, requires a Section 10 permit and approval from USACE. The Napa River is the only water body in the reconductoring project area that is regulated under Section 10 at the point of the line crossing.

4.8.1.2 State

California Fish and Game Code Section 1600 et seq.

Section 1602 of the Fish and Game Code states that a notification is required to be submitted to CDFW by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement is to be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). The entity may proceed with the activity in accordance with the final Agreement. If CDFW determines that the activity will not substantially adversely

affect existing fish or wildlife resources, the entity may commence the activity without an agreement, as long as it is conducted as described in the notification, including any measures in the notification that are intended to protect fish and wildlife resources.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, the State Water Board has authority over state waters and water quality. The RWQCBs have local and regional authority. The San Francisco Bay and Central Valley RWQCBs have authority in the project area.

The RWQCBs prepare and periodically update basin plans (water quality control plans), which establish:

- beneficial uses of water designated for each protected water body,
- water quality standards for both surface water and groundwater, and
- actions necessary to maintain these water quality standards.

Projects that will discharge waste to waters of the state must file a report of waste discharge with the appropriate RWQCB. The RWQCB will issue waste discharge requirements or a waiver of the waste discharge requirements for the project (California Wetlands Information System 2012).

Water Quality Control Plans

The preparation and adoption of water quality control plans (Basin Plans) is required by the California Water Code (Section 13240) and basin plans are developed, adopted and implemented by the Water Board. Basin plans include the beneficial water uses for the waters within that plan region that the Water Board will protect, water quality objectives needed to protect these designated beneficial uses, and strategies and time schedules for achieving the water quality objectives.

The project falls within the San Francisco Bay Basin (Region 2) Basin Plan and the Sacramento River and San Joaquin River Basin Plan. The following beneficial uses are provided for water resources within the project area: municipal and domestic supply (MUN), agricultural supply (AGR), industrial process water supply (PROC), industrial service water supply (IND), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), freshwater replenishment (FRSH), cold freshwater habitat (COLD), migration of aquatic organisms (MIGR), spawning, reproduction, and/or early development (SPWN), wildlife habitat (WILD), navigation (NAV), rare, threatened, or endangered species (RARE), commercial and sport fishing (COMM), and estuarine habitat (EST).

Water quality objectives described in the basin plans are considered necessary to protect the beneficial uses, described above. The following water quality objectives are applicable to the project: oil and grease, population and community ecology, sediment, settable material, suspended material, toxicity, and turbidity.

4.8.1.3 Local

PG&E is not subject to local discretionary land use regulations. However, PG&E has considered local plans and policies as part of its environmental review process.

The Engineering and Surveying Division of the Solano County Department of Public Works, the Napa County Department of Public Works, and the Permit and Resource Management Department of Sonoma County require and enforce standards contained in the California Building Code related to grading and construction. Among those grading and construction standards are those that may directly or indirectly affect surface water quality by contributing to erosion or siltation or alter existing drainage patterns.

Question 4.8a – Water Quality Standards and Waste Discharge Violations – Less-than-Significant with Mitigation Incorporated

Construction-related impacts on water quality have the potential to result from several different sources. Among these sources is contamination from fuels or other hazardous materials and increased erosion caused by grading or vegetation clearing that leads to increased sedimentation. To establish overland access routes, tower work areas, or helicopter landing zones for construction, vegetation may need to be cleared or mowed. In some instances, minor grading also may be needed to improve tower work areas or access roads. The reconductoring project has the potential to adversely affect water quality as a result of erosion and subsequent sedimentation that can result from the increased use of off-road vehicles or earth-disturbing activities. Crews also may drive through streams, use temporary bridges, and/or install temporary matting, as needed, to access work areas. Up to a total of approximately 20 project-related activities, such as crossing improvements and installation of guard structures, may impact streams, wetlands, swales, and/or depressions. At 19 locations, access road crossing improvements may impact seasonal wetlands and/or streams and at one location installation of temporary guard structures would be within a wetland and perennial stream. Table 4.8-2: Affected Aquatic Resource Summary provides detailed hydrological information for each of the 20 sites and a general overview of these activities are provided below. These locations are shown in Figure 4.8-1: Hydrology Overview Map.

Crossing Improvements. In several locations where access roads cross streams, wetlands, swales, and/or depressions, the project would require improvements at up to a total of approximately 19 crossings, including Sites 1 through 19. These 19 crossings are subject to Section 404 of the CWA. Additional information regarding features subject to CWA Section 404 is provided in Section 4.4, Biological Resources. Improvements include installing new culverts, replacing existing culverts, and/or adding rock, riprap or fill (dirt) to ensure that the locations are serviceable during construction and to allow for the safe passage of construction vehicles and equipment. The majority of crossing improvements would be permanent to allow for continued use of these crossings to support operation and maintenance activities after construction is completed.

Temporary Guard Structures. The use of temporary guard structures would result in temporary fill within a wetland/perennial stream at one location—Site 20. The temporary guard structures (composed of up to four wood poles) would be installed within an unnamed tributary to the Petaluma River, just east of Lakeville Substation, to prevent the conductors from sagging onto existing distribution lines during pulling activities.

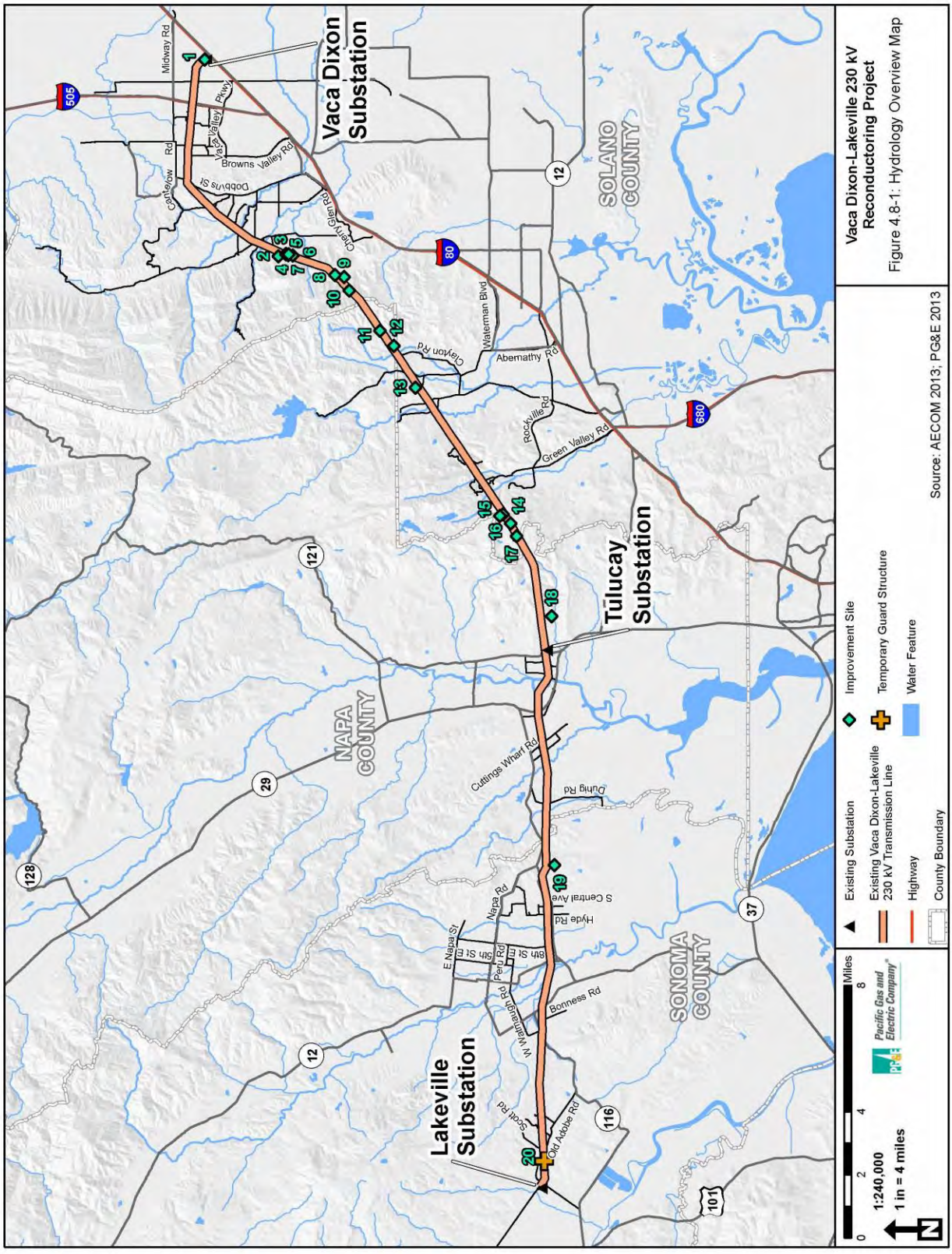
Vaca Dixon Substation
Tulucay Substation
Lakeville Substation
SOLANO COUNTY
NAPA COUNTY
SONOMA COUNTY
Midway Rd
Vaca Valley Pkwy
Browns Valley Rd
Cantelow Rd
Dobbins St
Cherry Glen Rd
Waterman Blvd
Abernathy Rd
Rockville Rd
Green Valley Rd
Clayton Rd
Cuttings Wharf Rd
Duhig Rd
Napa Rd
S Central Ave
Hyde Rd
5th St
E Napa St
Penn Rd
W Watmaugh Rd
Bonness Rd
Schell Rd
Old Adobe Rd
505
80
680
12
121
29
128
37
116
101
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Highway
County Boundary
Improvement Site
Temporary Guard Structure
Water Feature
0 2 4 8 Miles
1:240,000
1 in = 4 miles
N
Pacific Gas and Electric Company
PG&E
Vaca Dixon-Lakeville 230 kV Reconductoring Project
Figure 4.8-1: Hydrology Overview Map
Source: AECOM 2013; PG&E 2013

Table 4.8-2: Affected Aquatic Resource Summary

Site Number	Nearest Downstream Waterbody	Basin Plan Hydrologic Unit				Nearest Downstream Beneficial Use Water[1]	Beneficial Uses	Section 303(d) Listed[3]	Pollutant(s) Resulting in Impairment	Proposed Mitigation[4]
		Basin Name		Hydrologic Unit Code						
1	Gibson Canyon Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta	MUN, AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, COLD, MIGR, SPWN (without Cold), WILD, NAV	No	N/A	APM-BIO-15 (On-site restoration)
2	Alamo Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)[2]	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
3	Alamo Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
4	Alamo Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
5	Alamo Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1

Table 4.8-2: Affected Aquatic Resource Summary

Site Number	Nearest Downstream Waterbody	Basin Plan Hydrologic Unit				Nearest Downstream Beneficial Use Water[1]	Beneficial Uses	Section 303(d) Listed[3]	Pollutant(s) Resulting in Impairment	Proposed Mitigation[4]
		Basin Name		Hydrologic Unit Code						
6	Alamo Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
7	Alamo Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
8	Laguna Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
9	Laguna Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
10	Laguna Creek	Valley Putah-Cache	Elmira	511.1	A02.A0	Sacramento San Joaquin Delta (With Old Alamo Creek Amendment)	AGR, PROC, IND, REC-1 (without Canoeing and Rafting), REC-2, WARM, WILD, NAV	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
11	Ledgewood Creek	Suisun	Fairfield	207.23	E07.B3	Ledgewood Creek	FRSH, COLD, MIGR, SPWN, WARM, WILD, REC-1, REC-2	Yes	Diazinon	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1

Table 4.8-2: Affected Aquatic Resource Summary

Site Number	Nearest Downstream Waterbody	Basin Plan Hydrologic Unit				Nearest Downstream Beneficial Use Water[1]	Beneficial Uses	Section 303(d) Listed[3]	Pollutant(s) Resulting in Impairment	Proposed Mitigation[4]
		Basin Name		Hydrologic Unit Code						
12	Ledgewood Creek	Suisun	Fairfield	207.23	E07.B3	Ledgewood Creek	FRSH, COLD, MIGR, SPWN, WARM, WILD, REC-1, REC-2	Yes	Diazinon	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
13	Gordon Valley Creek	Suisun	Fairfield	207.23	E07.B3	Gordon Valley Creek	COLD, WARM, WILD, REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
14	Dug Road Creek	Suisun	Fairfield	207.21	E07.B1	Wild Horse Creek	FRSH, COLD, WARM, WILD, REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
15	Dug Road Creek	Suisun	Fairfield	207.21	E07.B1	Wild Horse Creek	FRSH, COLD, WARM, WILD, REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
16	Green Valley Creek	Suisun	Fairfield	207.21	E07.B1	Green Valley Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
17	Green Valley Creek	Suisun	Fairfield	207.21	E07.B1	Green Valley Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1

Table 4.8-2: Affected Aquatic Resource Summary

Site Number	Nearest Downstream Waterbody	Basin Plan Hydrologic Unit				Nearest Downstream Beneficial Use Water[1]	Beneficial Uses	Section 303(d) Listed[3]	Pollutant(s) Resulting in Impairment	Proposed Mitigation[4]
		Basin Name		Hydrologic Unit Code						
18	Suscol Creek	San Pablo	Napa River	206.5	E.06.E0	Suscol Creek	COLD, MIGR, RARE, SPWN, WARM, WILD REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
19	Steamboat Slough	San Pablo	Sonoma Creek	206.4	E06.D0	Steamboat Slough	COMM, EST, RARE, WILD, REC-1, REC-2	No	N/A	APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1
20	Petaluma River	San Pablo	Petaluma River	206.3	E06.C0	Petaluma River	COLD, EST, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2, NAV	Yes	Diazinon, Nutrients, Pathogens, Sedimentation/ Siltation, Trash	APM-BIO-15 (On-site restoration)

Notes:
[1] Basin plans do not provide beneficial uses for all waters within their region; therefore, the first encountered downstream/receiving water with listed beneficial uses to each site has been provided.
[2] Beneficial uses of waterbodies specified in this table apply to the tributaries of those waterbodies, with one exception. Sites 2-10 drain into Alamo Creek, a tributary to Sacramento San Joaquin Delta, and the MUN, COLD, MIGR and SPWN beneficial uses do not apply to Alamo Creek and are therefore not listed for Sites 2-10.
[3] Section 303(d) listed waters determinations are based on the nearest named downstream waterbody to the project site.
[4] As discussed in Section 4.4, Biological Resources, no mitigation is proposed for permanent impacts.
Source: Compiled by AECOM in 2014

Stream and wetland crossing improvements and the temporary guard structure locations are shown in Attachment J: Watershed Overview Map and Attachment K: Detailed Wetland and Stream Impact Map.

As discussed in the regulatory background, the project falls within the San Francisco Bay Basin (Region 2) Basin Plan and the Sacramento River and San Joaquin River Basin Plan. A number of the water quality objectives detailed in the basin plans could be affected by the project, and therefore could affect the beneficial uses of streams and wetlands in the project area. Improvements to stream and wetland crossings could potentially result in temporary sedimentation or other disturbance to hydrologic channel beds and banks during construction, thereby temporarily affecting the sediment load, including alteration of turbidity levels during construction and post-construction storm events in the waters in which improvements would occur. These water quality objectives would, however, only be affected during the construction of the crossing improvements (installing new culverts, replacing existing culverts, and/or adding rock, rip rap or fill (dirt), and PG&E would implement APM-HYDRO-1 to addressed these potential water quality concerns. Best management practices (BMPs) would be developed and implemented specifically for crossing improvement activities that could potentially affect the water quality objectives to ensure water quality limits are not exceeded and beneficial uses are protected. Once construction activities associated with the stream and wetland crossing improvements are completed, the project would be compliant with the water quality objectives detailed in the basin plans, and the crossing improvements would result in an overall benefit to the waters by improving flow and hydrological function, as well as by reducing overall erosion and sedimentation potential.

Because the project involves the use of construction equipment and vehicles near streams and wetlands, construction at these crossings could also result in impacts related to other water quality objectives in the basin plan, such as those associated with oil and grease, population and community ecology, and toxicity. However, with implementation of APM-HYDRO-1, APM-BIO-6, APM-BIO-14, and APM-HAZ-1, the impact on these water quality objectives would be less than significant with mitigation incorporated.

Because the reconductoring project would disturb more than 1 acre of soil, PG&E would obtain coverage under the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Construction Activities. To comply with this permit, PG&E would assess the risk to water quality based on site-specific soil characteristics, slope, and the construction schedule, and would implement APM-HYDRO-1 to develop a Stormwater Pollution Prevention Plan (SWPPP) to address potential water quality concerns. BMPs would be developed for each construction activity that potentially could degrade surrounding water quality through erosion, sediment runoff, and the presence of other pollutants. These BMPs would be included in the SWPPP and would be implemented and monitored throughout project construction by a qualified SWPPP practitioner, as mandated by the permit. With implementation of the SWPPP and standard BMPs, the temporary and short-term construction-related impact on water quality, including impacts resulting from stream and wetland crossing improvements, would be less than significant with implementation of APM-HYDRO-1. PG&E also would obtain authorization from the U.S. Army Corps of Engineers, the California Department of Fish and Wildlife, and the State Water Resources Control Board for improvements to stream and wetland crossings that result in permanent fill and/or impacts on streams and wetlands under the jurisdiction of these agencies.

Potential impacts and associated APMs to prevent accidental releases of hazardous materials used during construction, such as diesel fuel, hydraulic fluid, or oils and grease, are discussed in Section 4.7, Hazards and Hazardous Materials. With implementation of APM-HYDRO-1, conditions from regulatory permits, and APMs in Section 4.7, Hazards and Hazardous Materials, the impact on water quality standards and discharges would be less than significant with mitigation incorporated.

Question 4.8b – Groundwater Depletion or Recharge – No Impact

The reconductoring project would not result in an increase in non-permeable surfaces or otherwise interfere with groundwater recharge. A water truck would be available to support project construction activities and dust suppression. Typically, 5,000 to 10,000 gallons of water are required for dust control on a daily basis. The water would be obtained from local municipal sources in Napa or Vacaville, where construction yards would be established. Municipal water in Napa is derived entirely from surface water reservoirs, and thus, its withdrawal would not affect groundwater sources. Approximately 31 percent of municipal water in Vacaville is derived from groundwater, with the remaining 69 percent coming from surface water sources. The City of Vacaville delivers approximately 14 billion gallons of water to customers annually. Thus, construction is not anticipated to substantially affect water supplies to a level that would increase groundwater draw rates.

In the unlikely event that groundwater is encountered during excavation activities, such as auguring for installation of guard structure wood poles and the tubular steel pole at Tulucay Substation, APM-HYDRO-3 would be implemented. However, because encountering groundwater is not anticipated to occur because of the limited excavation activities proposed as part of the project, no impact would occur.

Question 4.8c – Drainage Patterns – Erosion/Siltation – Less-than-Significant with Mitigation Incorporated

The reconductoring project is not designed to substantially alter the drainage pattern of the site. The project would not alter the course of a stream or river. Furthermore, because major grading and contouring would not be required, the reconductoring project would not result in the substantial alteration of existing drainage patterns. Minor temporary grading may be needed in select locations to improve access or establish work areas to accommodate equipment, but it would be limited in scope and would not substantially alter site drainage nor result in substantially increased erosion or siltation. With implementation of appropriate BMPs before beginning construction, per the SWPPP as detailed in APM-HYDRO-1, and under the guidance of a qualified SWPPP practitioner, and with implementation of APM-HYDRO-2 to minimize ground disturbance, the impact would be less than significant.

Question 4.8d – Drainage Patterns – Runoff/Flooding – Less-than-Significant Impact

The reconductoring project would not include the creation of impervious surfaces or other means that could increase surface water runoff rates, nor would the project require the substantial modification of any upland sites to an extent that could alter drainage patterns in a way that would increase the potential for any on- or off-site flooding. In some locations, the permanent

replacement or installation of new culverts may be necessary within drainage channels or small creeks to accommodate the weight or size of construction equipment. The installation of an undersized culvert potentially would restrict water flow, resulting in localized flooding. In instances where a culvert may need to be installed or replaced, it would be sized accordingly to ensure that it could accommodate typical anticipated flows. Furthermore, PG&E would implement APM-BIO-15, which would require preparation of a Mitigation and Restoration Plan, to mitigate for changes to existing drainage patterns. Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.8e – Stormwater Runoff – Less-than-Significant with Mitigation Incorporated

Most of the existing transmission line corridor is located within rural residential, agricultural, or undeveloped areas where municipal or otherwise developed stormwater collection systems do not exist. Because the reconductoring project would not substantially alter the drainage patterns of any of the project work areas, it would not result in an increased amount of stormwater runoff that could exceed the capacity of existing systems. Furthermore, because PG&E would implement APM-HYDRO-1, which requires a SWPPP, the reconductoring project would not have any substantial effects on water quality from sediment-laden runoff or through the accidental discharge of hazardous materials. Thus, the reconductoring project would not exceed the capacity of existing or planned stormwater systems or provide substantial additional sources of polluted runoff. Therefore, with implementation of APM-HYDRO-1, the impact would be less than significant.

Question 4.8f – Other Water Quality Degradation – No Impact

No additional impact on water quality beyond those previously discussed is anticipated. Thus, the reconductoring project would not substantially degrade water quality, and no impact would occur.

Question 4.8g – Housing in Flood Hazard Areas – No Impact

The reconductoring project would not include housing construction. Therefore, no impact would occur.

Question 4.8h – Structures in Flood Hazard Areas – No Impact

The reconductoring project would include the installation of new screw anchors at Tower 25/114, which is located within a 100-year floodplain. These anchors are not anticipated to have any effect on the flows of floodwaters. No other structures would be permanently installed within flood zones. Therefore, no impact would occur.

Question 4.8i – Flood Exposure – No Impact

The reconductoring project would not affect existing levees, dams, or other flood control mechanisms. As discussed previously, several towers are located within potential dam failure inundation areas. The project towers are pre-existing and conductor replacement would not affect the risk of loss, injury, or death resulting from flooding. Thus, the reconductoring project would

not expose people or structures to a substantial risk of loss, injury, or death resulting from flooding. Therefore, no impact would occur.

Question 4.8j - Seiche, Tsunami, and Mudflow – No Impact

The reconductoring project would not affect the susceptibility of the existing transmission line corridor to increased risk of inundation resulting from seiche, tsunami, or mudflow. Therefore, no impact would occur.

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4.9 LAND USE AND PLANNING

Table 4.9-1: CEQA Checklist for Land Use and Planning

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Physically divide an established community?				☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on land use and planning resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.9a – Physical Division of an Established Community – No Impact

The reconductoring project would not divide an established community because the scope of the project would reconductor an existing transmission line. No structures that would create a division within the established community would be constructed. Therefore, no impact would occur.

Question 4.9b – Plans and Policy Conflicts – No Impact

The existing transmission line corridor crosses a variety of land types; agriculture, industrial, commercial, and residential uses are located within multiple local jurisdictions, including Solano, Napa, and Sonoma counties, and the cities of Vacaville and Napa. Project construction primarily would occur within the existing transmission line corridor; therefore, the reconductoring project would not result in any significant changes to land uses in the project area. In addition, the reconductoring project is not subject to local discretionary permitting or design review. Therefore, no impact would occur.

Question 4.9c – Habitat Conservation Plan or Natural Community Conservation Plan Conflicts – No Impact

No adopted applicable habitat conservation plans or natural community conservation plans exist in the project area. Therefore, no impact would occur.

4.9.1 REFERENCES

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4.10 MINERAL RESOURCES

Table 4.10-1: CEQA Checklist for Mineral Resources

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on mineral resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.10a – Loss of Regional- or State-Valued Mineral Resources – No Impact

Napa County, Sonoma County, and the portion of Solano County that is traversed by the existing transmission line corridor fall within Mineral Resources Zones (MRZs), described in the Surface Mining and Reclamation Act (SMARA) Mineral Land Classification Special Report 146 Part III.

The most important zone with respect to the presence of mineral resources along the existing transmission line corridor is MRZ-2, which is defined as "areas where adequate information indicates that significant mineral (aggregate) deposits are present or where it is judged that there is a high likelihood for their presence." This zone is applied to known mineral deposits or, based on economic geologic principles and adequate data, where well-developed lines of reasoning demonstrate that the likelihood for occurrence of significant mineral deposits is high.

The existing transmission line corridor crosses two areas that are designated MRZ-2. An area that closely follows Sonoma Creek is designated MRZ-2 for aggregate resources, including sand and gravel materials. An area of Napa County, between State Route 221 on the west and Tulucay Substation on the east, is designated for a deposit of Sonoma Volcanics, including crushed stone resources of rhyolite, andesite, basalt, perlitic rhyolite, and tuff. The basalt is suitable for asphaltic concrete aggregate, while the other material can be used for roadbase or subbase aggregate or fill.

The reconductoring project would not include the expansion of any existing substations or installation of new structures outside of existing facilities. The installation of new conductors and required tower modifications would not change the future availability of mineral resources along the existing transmission line corridor. Therefore, no impact would occur.

Question 4.10b – Loss of Locally Important Mineral Resources – No Impact

No locally designated mineral resources recovery sites are along the existing transmission line corridor. Therefore, no impact would occur.

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4.11 NOISE

Table 4.11-1: CEQA Checklist for Noise

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		☒		
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			☒	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			☒	
e) If located within an airport land use plan or within two miles of a public airport or public use airport for which such a plan has not been adopted, would the project result in exposure of persons residing or working in the project area to excessive noise levels?				☒
f) If located within the vicinity of a private airstrip, would the project result in exposure of persons residing or working in the project area to excessive noise levels?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts related to noise resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring of the existing Vaca Dixon-Lakeville 230 kV Transmission Line, as detailed in the project description.

Question 4.11a – Exposure to Noise in Excess of Standards – Less-than-Significant Impact with Mitigation Incorporated

Although the reconductoring project is not subject to local discretionary permitting, this discussion of the project's anticipated construction noise is presented in the context of local standards or ordinances in Solano, Sonoma, and Napa counties, and the cities of Napa and Vacaville for informational purposes and to assist with CEQA review. The reconductoring project would not create a new stationary source of noise; therefore, the impact analysis is limited to consistency with local construction noise standards.

Typical noise levels generated by construction equipment have been calculated and previously published in various reference documents. One of the most comprehensive assessments of construction equipment noise is the Roadway Construction Noise Model (RCNM) User's Guide (FHWA 2006). The expected equipment noise levels listed in the RCNM User's Guide were used for this evaluation.

Review of typical noise levels from project construction equipment indicates that the loudest equipment generally produce a noise level of 85 decibel (dB) L_{max} at a distance of 50 feet. Assuming a usage factor of 40 to 50 percent (typical), and assuming standard spherical spreading loss (-6 dB per doubling of distance), the loudest assumed construction equipment produces an hourly average noise level of approximately 75 dB (hourly equivalent continuous noise level) at a distance of 50 feet. Noise at any specific receptor is dominated by the closest and loudest equipment. The types and numbers of construction equipment near any specific receptor location vary over time.

A number of project construction activities, such as cage-top extension installation, existing sleeve removal, and other minor modifications to towers, would require the use of a helicopter in some locations. Noise from helicopters would be audible at various tower sites, helicopter landing zones, and along flight paths. Helicopter noise levels during takeoff, approach, and level flyover would be a maximum (L_{max}) of 85 dB, 88 dB, and 86 dB, respectively, with a lateral offset of 492 feet (approximately 150 meters) and a helicopter altitude of 394 feet above ground level (approximately 120 meters).[12]

The City of Napa limits construction activities to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and no start-up of machines or equipment before 8:00 a.m. is allowed. Project activities would not include starting equipment before 8:00 a.m. and construction activities would be limited to the hours of 7:00 a.m. to 7:00 p.m. in the City of Napa. If nighttime construction was necessary to continue work until a safe stopping point was reached or if planned electrical outages (clearances) were scheduled at night, construction activities would be infrequent and short-term. Therefore, the impact would be less than significant.

Napa County has a construction noise standard of 75 dB L_{max} between the hours of 7 a.m. and 7 p.m., and 60 dB L_{max} between the hours of 7 p.m. and 7 a.m.[13] The loudest construction equipment on the ground generally produces a noise level of 85 dB L_{max} at a distance of 50 feet. Using this reference noise level of 85 dB L_{max} at a distance of 50 feet, and based on standard spherical spreading loss (-6 dB per doubling of distance), project construction noise levels would not be expected to exceed 75 dB L_{max} at a distance of 158 feet, which would meet the County of Napa's threshold for daytime construction noise. Four residences are within approximately 158 feet of the existing transmission line corridor and project work sites, and their occupants would be exposed to construction noise levels that would exceed Napa County's construction

[12] Takeoff and landing noise level data were collected at 492 feet from the side of the approach and departure centerline, assuming a 6-degree approach and departure flight paths and an altitude of 394 feet above ground level. The helicopter represented by this data is the Bell 212.

[13] Per the Napa County Code of Ordinances, construction activities should not exceed these noise levels, if technically and economically feasible; however, Napa County does allow construction activities to exceed the noise threshold in the event of emergency work of public utilities or by variance issued by the appropriate authority.

noise standards of 75 dB L_{max} for daytime noise. While PG&E is not subject to local noise ordinances for project construction, PG&E would implement APM-NO-1 and APM-NO-2 to reduce the impact to a less-than-significant level. The impact would be less than significant with mitigation incorporated.

Maximum helicopter noise levels associated with project construction would be approximately 88 dB (L_{max}) at a distance of about 500 feet. Helicopter operations would need to occur approximately 2,000 feet or further from residences to comply with Napa County's daytime construction noise standards of 75 dB L_{max}. Because several landing zones are within 2,000 feet of residences and helicopters could fly within 2,000 feet of residences, a number of residences could be exposed to helicopter noise levels that would exceed Napa County's daytime construction noise standards (no nighttime helicopter use would occur). PG&E would implement APM-NO-2 and APM-NO-3 to reduce the impact to a less-than-significant level. The impact would be less than significant with mitigation incorporated.

Construction noise standards are not addressed in the general plans of Solano and Sonoma counties, or by the City of Vacaville, and these jurisdictions do not have a noise ordinance. Therefore, the reconductoring project would not violate any local noise requirements within these jurisdictions. No impact would occur.

Question 4.11b – Exposure to Groundborne Vibration – Less-than-Significant Impact

Project construction would include some ground-disturbing activities, and potential grading and movement of heavy construction equipment may generate localized groundborne vibration. Vibration from such equipment (e.g., graders, excavators, and loaders) would be no more than 0.089 inch per second peak particle velocity or 87 velocity decibels (VdB) when measured at a distance of 25 feet. At distances of 100 feet or more, this level would be reduced to below 80 VdB, which generally is considered the compatibility threshold for residential land use affected by infrequent vibration events. Because the closest residences to these construction operations would be more than 100 feet away, any experienced vibration levels associated with project construction would be less than the generally accepted threshold. Therefore, the impact would be less than significant.

Question 4.11c – Substantial Permanent Ambient Noise Increases – No Impact

As noted previously, noise impacts resulting from the reconductoring project would not change from existing conditions. Only project construction would create temporary and short-term noise-related impacts. After construction is completed, project operation would not result in a permanent increase in ambient noise in the project vicinity. Therefore, no impact would occur.

Question 4.11d – Substantial Temporary or Periodic Ambient Noise Level Increases – Less-than-Significant Impact

Table 4.11-2: Residences near the Project Corridor and Helicopter Landing Zones summarizes the approximate number of sensitive receptors (residences) within 100 feet, 500 feet, and 0.25 mile of the project corridor and helicopter landing zones.

Table 4.11-2: Residences near the Project Corridor and Helicopter Landing Zones

Project Component	Number of Residences		
	Within 100 feet	Within 500 feet	Within 0.25 mile
Project Corridor	3	88	283
Helicopter Landing Zones	0	7	66
Source: Data compiled by AECOM in 2013			

Noise at any of these specific sensitive receptors would be dominated by the closest and loudest equipment. The types and numbers of construction equipment near any specific sensitive receptor location would vary during the construction period. The following ground-level construction scenarios were used to assess worst-case construction noise exposure for the reconductoring project:

- one piece of equipment operating 50 feet away from a sensitive receptor;
- two pieces of equipment operating 100 feet away from a sensitive receptor; and
- two pieces of equipment operating 200 feet away from a sensitive receptor.

Each piece of construction equipment would produce a reference noise level of 85 dB L_{max} at a distance of 50 feet from a sensitive receptor and would be used 40 percent of the time. Table 4.11-3: Expected Worst Case Construction Equipment Noise Levels (from Operation of Ground Construction Equipment) summarizes the estimated ground-level construction noise at various distances based on these scenarios.

Table 4.11-3: Expected Worst Case Construction Equipment Noise Levels (from Operation of Ground Construction Equipment)

Distance from Construction Activities (feet)	Noise Level Hourly Equivalent Continuous Noise Level (decibels)
50	83
100	79
200	74
400	69
800	63
1,600	58
3,200	52
6,400	46
Source: Data compiled by AECOM in 2013	

The use of construction equipment would increase noise levels relative to ambient conditions in the project vicinity. However, construction activities would be temporary, short-term, and intermittent. Therefore, the impact would be less than significant. If needed, nighttime construction would be short-term and intermittent. Furthermore, PG&E would implement APM-NO-1 and APM-NO-2 to further reduce the impacts of noise level increases.

Question 4.11e – Air Traffic Noise from Public Airports – No Impact

Three public and two public use airports are within 2 miles of the existing transmission line corridor. Solano and Napa counties and the City of Vacaville have established noise contour maps for each of their airports, and these maps show the projected noise exposure of the area surrounding the airports (Sonoma County 2008, City of Vacaville 2010, Napa County Airport Land Use Commission 1999). The 55-dB contour is the outermost noise boundary, representing the lowest noise area surrounding the airport. The project corridor is located outside of the 55-dB noise contour of the Nut Tree, Petaluma Municipal, Sonoma Skypark, Sonoma Valley, and Napa County airports. Project construction workers would not be exposed to excessive noise levels from nearby airports. Therefore, no impact would occur.

Question 4.11f – Air Traffic Noise from Private Airstrips – No Impact

No private-use airports or airstrips are located within 2 miles of the existing transmission line corridor. Therefore, project construction would not result in excessive noise exposure to people residing or working in the project vicinity. No impact would occur.

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4.12 POPULATION AND HOUSING

Table 4.12-1: CEQA Checklist for Population and Housing

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on population and housing resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.12a – Population Growth – No Impact

The reconductoring project would not include new housing, businesses, or land use changes that would induce population growth in Solano, Napa, and Sonoma counties, including the cities of Vacaville and Napa. The reconductoring project would accommodate existing and planned growth within the region and would not alter the location, distribution, density, or growth rate of the population. Therefore, no impact would occur.

Question 4.12b – Displacement of Existing Housing – No Impact

The project would be constructed within an existing right-of-way, and project work areas would not displace existing housing. In addition, no replacement housing would be constructed. Therefore, no impact would occur.

Question 4.12c – Displacement of People – No Impact

Project construction would require a small number of workers (up to a maximum of approximately 45 workers at any given time). The majority of construction workers would come from the local area or would commute from neighboring counties and cities, or they would be

from regular and existing contractors of PG&E. Thus, none of the construction workforce would be expected to relocate to the project vicinity and cause a displacement of housing or people. Therefore, no impact would occur.

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4.13 PUBLIC SERVICES

Table 4.13-1: CEQA Checklist for Public Services

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?			☒	
Police protection?			☒	
Schools?				☒
Parks?			☒	
Other public facilities?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on public services resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.13a – Adverse Impact to Public Services – Less-than-Significant Impact or No Impact

Because of the temporary nature of construction and the availability of a local workforce, project construction is not expected to result in direct population increases. For this reason, project construction would not increase demands on parks, schools, utilities, or other public services. Furthermore, as a result of construction planning and design, and associated precautions (further described in Chapter 3, Project Description), project construction would not place undue demands on fire protection or law enforcement services. The reconductoring project would increase the reliability of power delivery to these public services. A review of potential impacts on public services is described in the following subsections.

Fire and Police Protection – Less-than-Significant Impact

As described in Section 4.15, Transportation and Traffic, PG&E would coordinate with local jurisdictions, the California Highway Patrol, and the California Department of Transportation to implement any temporary lane closures, road closures, or rolling stops—which would typically be very short in duration (e.g., less than one-quarter of an hour)—that may be required to accommodate construction activities. Furthermore, if emergency vehicles required urgent access through temporary road closure locations, these vehicles would be allowed to pass immediately after it was deemed safe to do so by on-site PG&E personnel. Because closures would be consistent with city and county policies and state regulations, and would be temporary and short-term in nature, emergency response times would not be affected. Therefore, the impact would be less than significant.

Schools, Parks, and Other Public Facilities – Less-than-Significant Impact or No Impact

The reconductoring project would not create additional demand for schools, parks, or other public facilities because its short construction phase would not increase the local population. No schools, parks, or other public facilities would be permanently closed or removed as part of project construction. Therefore, no impact would occur.

As shown in Figure 4.14-1: Recreational Facilities in Section 4.14, Recreation, two parks—Petaluma Adobe State Park and Skyline Wilderness Park—are located within 0.5 mile of the existing transmission line corridor. Construction-related traffic and activities would have no impact on Petaluma Adobe State Park, but they may result in short-term, temporary closure of the segment of the San Francisco Bay Area Ridge Trail on the Tuteur private property in Skyline Wilderness Park. Any closures of the trail that are required for public safety during project construction would be temporary and short-term in nature (typically 10 days or less). As discussed in Section 4.14, Recreation, the effect of this short-term trail closure would be minor. Therefore, the impact would be less than significant.

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4.14 RECREATION

Table 4.14-1: CEQA Checklist for Recreation

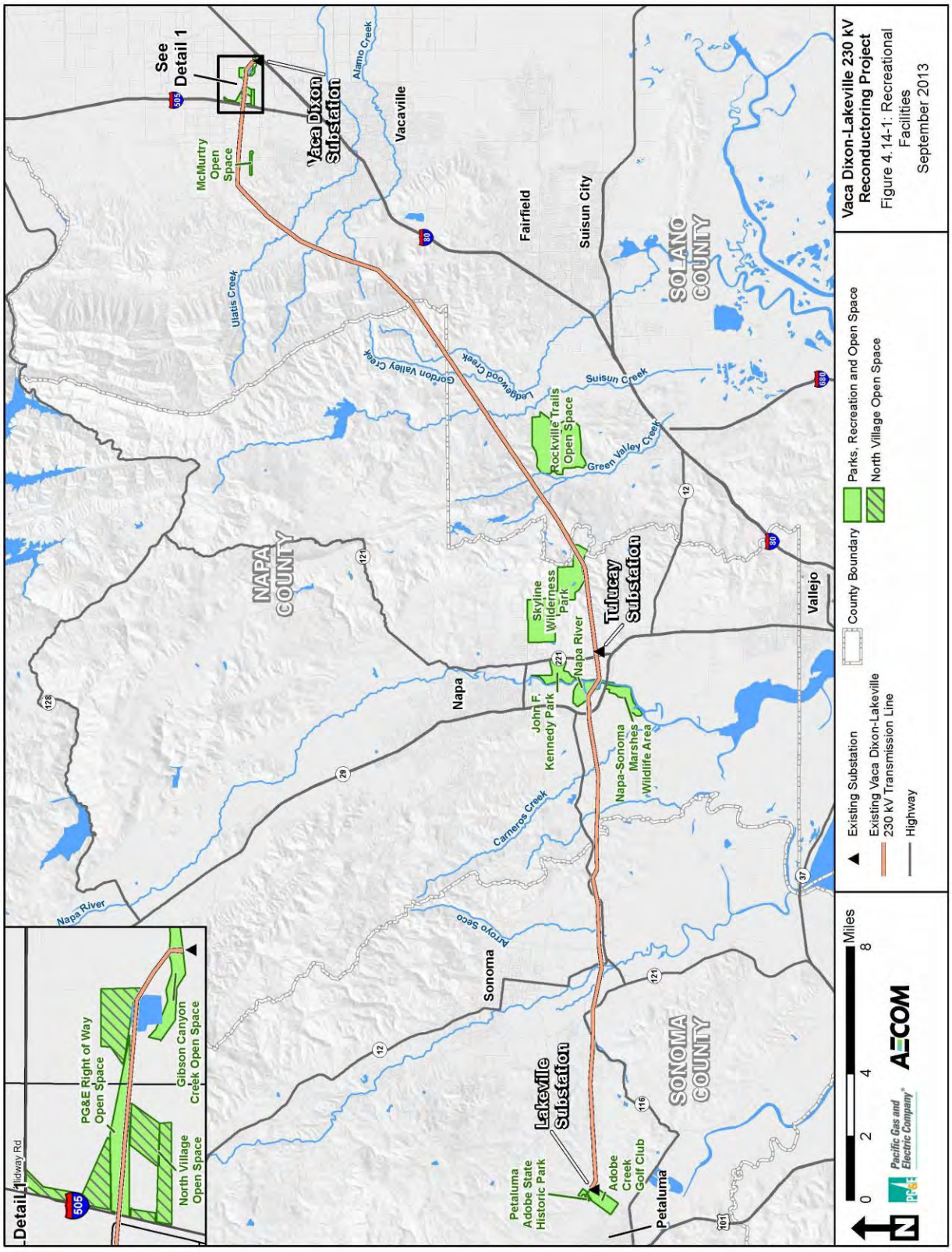
Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			☒	
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on recreational resources resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.14a – Recreational Facilities Use – Less-than-Significant Impact

Increases in overall permanent demand for recreational facilities are typically associated with substantial increases in population, either by the construction of new residences or the creation of a major job generator that will indirectly increase the number of residents in an area. Project implementation would not result in a substantial increased demand for recreational facilities nor would it adversely affect the existing recreational resources in a permanent manner. Although it is possible that some project construction workers may use local parks and recreational facilities during non-working hours, the limited number of workers needed for the reconductoring project would not result in a substantial increase in demand on such facilities to cause their accelerated physical deterioration. Therefore, no impact would occur.

Although the reconductoring project would not result in physical deterioration of any parks, construction activities may result in short-term, temporary closure of the segment of the San Francisco Bay Area Ridge Trail located within Skyline Wilderness Park on the Tuteur private property and affected open space areas in the City of Vacaville. The locations of these facilities are shown in Figure 4.14-1: Recreational Facilities. Temporary impacts on the use of the San Francisco Bay Area Ridge Trail loop trail segment on the Tuteur property in Skyline Wilderness Park may occur during tower raising activities at a nearby tower, approximately 0.5 mile west of the trail, and during reconductoring activities in the vicinity of the project work area.


Vaca Dixon-Lakeville 230 kV Reconductoring Project
Figure 4.14-1: Recreational Facilities
September 2013
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Highway
County Boundary
Parks, Recreation and Open Space
North Village Open Space
Miles
0 2 4 8
Pacific Gas and Electric Company
AECOM
See Detail 1
Vaca Dixon Substation
McMurtry Open Space
Alamo Creek
Vacaville
Fairfield
Suisun City
SOLANO COUNTY
Ulatis Creek
Gordon Valley Creek
Ledgewood Creek
Suisun Creek
Rockville Trails Open Space
Green Valley Creek
NAPA COUNTY
Skyline Wilderness Park
Tulucay Substation
Napa River
John F. Kennedy Park
Napa
Vallejo
Napa-Sonoma Marshes Wildlife Area
Carneros Creek
Petaluma River
Sonoma
Sonoma Creek
Lakeville Substation
SONOMA COUNTY
Petaluma Adobe State Historic Park
Adobe Creek Golf Club
Petaluma
Detail 1
Lakeville Highway Rd
PG&E Right of Way Open Space
Gibson Canyon Creek Open Space
North Village Open Space

A pull site and a helicopter landing zone would be situated just north of the Tuteur parcel, approximately 0.25 mile from the trail loop (San Francisco Bay Trail 2012). Any trail closures that are required for public safety during project construction would be temporary and short-term (typically 10 days or less). Several proposed access roads are located on the slopes immediately south of Skyline Wilderness Park, and tower raising activities are proposed at four towers in that vicinity, two of which are located approximately 0.25 mile from the park boundary. However, the project access roads would be separated by a ridgeline from the trails in the park, which would provide a visual and noise barrier to much of the project construction activity and would help to minimize potential temporary and short-term impacts on trail users. Therefore, the impact would be less than significant. PG&E would implement APM-REC-1 to maintain safe recreational access by directing people to safe areas along the construction zone in the event that trails closures at the aforementioned facilities are necessary. Furthermore, many additional miles of unaffected trails exist within Skyline Wilderness Park, which would serve to minimize potential temporary or short-term impacts from project construction on trail users.

Similar temporary and short-term impacts on the use of the open space areas in north Vacaville may occur during project reconductoring activities and during installation of cage-top extensions at an existing tower (located approximately 0.4 mile north of the McMurtry Open Space) and at a tower located approximately 0.25 mile north of Vaca-Dixon Substation. A helicopter landing zone would be located within a City of Vacaville open space parcel along Leisure Town Road, approximately 0.8 mile northwest of Vaca-Dixon Substation, and a pull site would be located on the parcel immediately north of Vaca-Dixon Substation, designated by the City of Vacaville as Gibson Canyon Creek Open Space. Any closures of the open space areas in the north Vacaville area that are required for public safety during project construction would be temporary and short-term (typically 10 days or less). Therefore, the impact would be less than significant.

The reconductoring project is not expected to affect any of the other four parks or recreation facilities located within 0.5 mile of the existing transmission line corridor or users of those facilities. Although Petaluma Adobe State Historic Park and Adobe Creek Golf Club are located immediately adjacent to Lakeville Substation, the minor project construction activities planned at this location would not affect either of these recreational facilities. The existing transmission line corridor is located far enough from Napa-Sonoma Marshes Wildlife Area (Southern Crossing Unit) and Rockville Trails Open Space so that project construction would not affect these recreation areas. In addition, no recreational development exists at either of these locations—Rockville Trails Open Space is not yet open to the public and only limited access is planned for the facility in the near future. To observe and assist vessels traveling along the river, a construction worker would be present during project reconductoring and marker ball replacement activities that occur in the vicinity of the Napa River. No river closures to boating activities are anticipated to result from project construction. Thus, these parks and recreation facilities would not be affected by the reconductoring project and no impact would occur.

Question 4.14b – Recreational Facilities Changes – No Impact

The reconductoring project would not include construction of new, or the expansion of existing, recreational facilities. Other than the aforementioned temporary impacts, the project would not result in any changes to existing recreational facilities. Therefore, no impact would occur.

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4.15 TRANSPORTATION

Table 4.15-1: CEQA Checklist for Transportation

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			☒	
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			☒	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?		☒		
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			☒	
e) Result in inadequate emergency access?			☒	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on transportation and traffic resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.15a – Traffic Plan or Policy Conflicts – Less-than-Significant Impact

Most project construction activities would occur within PG&E's existing transmission line corridor right-of-way and would not be located within regional or local roadways. Guard

structures would be installed where the existing transmission line corridor crosses major roads, such as state highways and freeways, to allow traffic to safely use the road while PG&E performs reconductoring work. Temporary road closures would occur on major roadways for the installation of netting for guard structures. PG&E would coordinate with the California Highway Patrol and the California Department of Transportation (Caltrans) to implement stops, typically very short in duration (e.g., less than one-quarter of an hour), at these locations. Operation of Class II bike routes and mass transit routes in the existing transmission line corridor may be temporarily affected during reconductoring of segments that cross roads. The impact would be less than significant.

Because construction completion is anticipated to require approximately 12 months and equipment would not travel daily once it is staged at project work areas (including the existing transmission line corridor and substations), construction-related traffic would not conflict with any traffic plans that establish measures of effectiveness for the performance of the circulation system. Although construction activities may generate increases in traffic on interstate highways, state routes, and local roads, the effects would be temporary, short term, and periodic. Therefore, the impact would be less than significant. Furthermore, PG&E would comply with Caltrans guidelines and applicable city and county policies for all locations of potential lane closures or width reductions, and would obtain all necessary transportation and/or encroachment permits from local jurisdictions and Caltrans, as identified in Table 3-3: Required Permits and Approvals. Therefore, the impact would be less than significant.

Question 4.15b – Level of Service Changes – Less-than-Significant Impact

As previously discussed, potential project-related traffic congestion would be temporary, short-term, and periodic. Therefore, the impact would be less than significant.

Question 4.15c – Air Traffic Changes – Less-than-Significant with Mitigation Incorporated

In locations where vehicle access to towers would be problematic because of physical or biological constraints, helicopters would be used to transport and install towers and cage-top extensions, and to transport personnel and materials. Helicopter landing zones would be established at several locations along the existing transmission line corridor. PG&E would follow established protocols regarding air traffic. Therefore, the impact would be less than significant.

The majority of construction activities that would involve the use of a helicopter would be located within PG&E's right-of-way, where no residences are located. Therefore, the flight path of helicopters from landing zones would pose relatively few safety risks outside of the alignment. Helicopters that would be carrying equipment or construction materials would not pass over major highways or habitable structures; however, in the unlikely event that construction plans require otherwise, APM-TRA-1 would reduce this potential impact to a less-than-significant level by requiring PG&E to coordinate with residents to temporarily vacate their homes or businesses. To further reduce impacts related to air traffic changes, implementation of APM-TRA-1would require coordination with local airports before and during construction and compliance with all Federal Aviation Administration regulations regarding air traffic within 2

miles of the existing transmission line corridor. Therefore, the impact would be less than significant with mitigation incorporated.

Question 4.15d – Increase in Hazards – Less-than-Significant Impact

Project construction would not alter any roadways or intersections, including access roads to power lines, towers, and substations, nor would it introduce incompatible uses to the existing transmission line corridor. Some existing unpaved access roads may be reestablished as part of the construction activities, as necessary; however, these unpaved roads have been used previously for maintenance activities. Temporary unpaved access routes also would be designed to allow safe ingress and egress from any public roadways and to accommodate large construction equipment safely. No new permanent roads would be constructed as part of the reconductoring project. Any road closures that would occur on private and county roads would be temporary and short term, and would be coordinated with property owners and relevant counties, respectively. Therefore, the impact would be less than significant.

Question 4.15e – Emergency Access Effects – Less-than-Significant Impact

Construction vehicles would access project work areas using existing paved, dirt, and/or gravel roads and overland travel routes; helicopters also would be also used to access towers. Construction vehicles and equipment needed at the pull sites would be staged or parked within the existing transmission line corridor, approved temporary construction easements, or alongside access roads. Closures would comply with city and county policies and state regulations, and would be temporary and short-term. Therefore, the impact would be less than significant.

Question 4.15f – Alternative Transportation Conflicts – No Impact

Project construction would not conflict with any policies, plans, or programs that support alternative transportation (e.g., bus turnouts or bicycle racks) because the majority of project-related construction activities would occur within PG&E's existing transmission line corridor and substations. Therefore, no impact would occur.

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4.16 UTILITIES

Table 4.16-1: CEQA Checklist for Utilities

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities (the construction of which could cause significant environmental effects)?				☒
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities (the construction of which could cause significant environmental effects)?				☒
d) Have sufficient water supplies available from existing entitlements and resources to serve the project from existing entitlements and resources, or are new and expanded entitlements needed?				☒
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			☒	
g) Comply with federal, state, and local statutes and regulations related to solid waste?				☒

Operation and maintenance activities for the reconductored transmission line and existing substations would not change from current practices. As such, impacts on utilities and service systems resulting from the reconductoring project would not change from existing conditions and no operation-related impacts would occur. Therefore, the impact analysis is limited to temporary and short-term construction impacts associated with reconductoring the existing Vaca Dixon-Lakeville 230 kV Transmission Line, which includes the Vaca Dixon-Lakeville and Vaca Dixon-Tulucay-Lakeville circuits, as detailed in Chapter 3, Project Description.

Question 4.16a – Wastewater Treatment Requirement Exceedances – No Impact

Wastewater disposal during project construction would not be required. The municipal water used for dust-suppression activities would evaporate or would be absorbed into the ground. Furthermore, portable restrooms would be provided and maintained by a licensed sanitation contractor for on-site use by construction workers. The licensed contractor would dispose the

wastewater at a local sewage treatment plant, in compliance with standards established by the State Water Resources Control Board. Therefore, no impact would occur.

Question 4.16b – Water and Wastewater Treatment Facility Expansion – No Impact

As stated previously, the small amount of water used during project construction for dust control would be obtained from existing municipal sources and wastewater from potable restrooms would be treated by existing local facilities. Project construction would not require additional capacity at existing municipal water or wastewater treatment facilities. Therefore, no impact would occur.

Question 4.16c – Stormwater Drainage Facility Expansion – No Impact

Project construction would not result in a substantial increase in stormwater on impervious surfaces or otherwise affect stormwater runoff in a manner that would require changes to existing stormwater drainage facilities or the addition of new stormwater drainage facilities. Temporary, short-term vegetation clearing and earth-disturbing activities would be conducted. As discussed in Section 4.8, Hydrology, Water Quality, and Beneficial Uses of Waters of the State, these activities would comply with the requirements of the General Construction Stormwater Permit and would not result in changes to existing stormwater facilities or require the construction of new facilities. Therefore, no impact would occur.

Question 4.16d – Water Supply Availability – No Impact

The primary need for water would be for dust control on dirt access roads and in temporary project work areas that require grading, soil excavation and stockpiling, or other earth-disturbing activities. PG&E would use water supplied from an existing municipal or private water supply source for dust control to the extent practicable, as discussed in Section 4.3, Air Quality. Potable water would be supplied to construction workers for drinking and would be delivered to project work areas by construction vehicles and equipment. Existing water entitlements and resources would be sufficient to accommodate the minor temporary and short-term water needs for project construction. Therefore, no impact would occur.

Question 4.16e – Wastewater Treatment Capacity – No Impact

Portable restrooms would be provided for construction worker use during project construction. Sanitary waste would be disposed at appropriately licensed local facilities with adequate capacity to accommodate the project needs. Therefore, no impact would occur.

Question 4.16f – Landfill Capacity – No Impact

The cage-top extensions and new conductor would have minimal packaging, most of which would be recycled through PG&E's existing recycling programs. After removal, the existing conductors would be recycled and the old insulators would be disposed at local landfills. The reconductoring project would generate minimal solid waste beyond the insulators and food containers, glass, paper, plastic, and packing materials generated by the approximately 45 construction workers who would be on site during peak construction periods. Existing local

landfills in the project vicinity would have adequate capacity to accommodate this small amount of solid waste. Therefore, impacts would be less than significant.

Question 4.16g – Solid Waste Statutes and Regulations – No Impact

All project construction debris would be collected and hauled off site for recycling or disposal. PG&E would comply with all federal, state, and local statutes and regulations related to solid waste. Therefore, no impact would occur.

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4.17 MANDATORY FINDINGS OF SIGNIFICANCE

Table 4.17-1: CEQA Checklist for Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			☒	
b) Have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?				☒
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)			☒	
d) Does the project have environmental effects that which will cause substantial adverse effects on human beings, either directly or indirectly?			☒	

Question 4.17a – Degrade or Threaten to Eliminate the Environmental Quality for Wildlife or Plant Species – Less-than-Significant Impact

The reconductoring project would involve replacing one existing light-duty steel pole with a tubular steel pole, stabilizing the foundation on one existing lattice steel tower, and above-ground modifications to other existing towers; therefore, the project would not substantially increase the permanent footprint of the existing infrastructure. Approximately 0.04 total acre of riparian and/or seasonal wetland would be permanently affected to facilitate access to project work sites. Drainage crossing improvements would include replacement or installation of culverts and/or placement of rock or rip rap so that access roads would be serviceable during construction, thereby allowing the safe passage of construction vehicles and equipment. The small amount of fill would not result in substantial adverse effects on federally protected wetlands. Construction activities may have minor, short-term impacts on natural habitats and special-status species, as detailed in Section 4.4, Biological Resources. However, the species that have the potential to be affected by the project are wide-ranging and these temporary disturbances would not substantially reduce the habitat of fish or wildlife species, cause a fish or

wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, or reduce the number or restrict the range of a rare or endangered plant or wildlife species. Therefore, impacts would be less than significant. Moreover, the project has been designed to avoid or minimize even temporary impacts to species and habitats by conducting pre-construction surveys, defining clear work areas, and returning disturbed areas to pre-existing conditions following completion of the project. The project includes a variety of applicant-proposed measures (APMs) to address water quality, nesting birds, and protection of special-status species. In addition, PG&E would implement storm water best management practices (BMPs) and coordinate with and obtain any necessary authorizations from the U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), State Water Resources Control Board (State Water Board), and U.S. Fish and Wildlife Service (USFWS).

As discussed in Section 4.5, Cultural Resources, cultural resources surveys and records searches identified 29 archaeological resources in the existing transmission line corridor and related work sites. However, construction work areas and access roads have been adjusted to avoid impacts known cultural sites. Therefore, the reconductoring project would not eliminate important examples of major periods of California history or prehistory, and the impact would be less than significant. Moreover, construction workers would be trained to respect the clearly flagged work area limits and report any unanticipated cultural resource discoveries.

Existing operation and maintenance activities would not change after construction of the reconductoring project. Therefore, no impact would occur.

Question 4.17b– Potential to Achieve Short-term Environmental Goals to the Disadvantage of Long-term Environmental Goals – No Impact

The reconductoring project would not achieve short-term environmental goals to the disadvantage of long-term environmental goals; it would result in no impact or less-than-significant impacts in both the short term and the long term. The project would be compatible with local environmental goals and would not conflict with federal or state environmental policies and regulations. Therefore, no impact would occur.

Question 4.17c – Impacts that are Individually Limited but Cumulatively Considerable – Less-than-Significant Impact

Project impacts would include short-term disturbances caused by construction activities and minor changes to the existing landscape setting from height increases associated with the installation of cage-top extensions on existing towers. During construction, habitat and vegetation would be temporarily disturbed and minor visual changes to the landscape would occur. Modifying existing towers and replacing conductors would result in relatively minor, incremental changes to the existing landscape setting. The incremental impact of the project, when added to other closely related past, present, and reasonably foreseeable, probable future projects, would not constitute a cumulatively considerable contribution to cumulative impacts on project-related resources.

PG&E anticipates that construction of the reconductoring project would begin in 2015 and the reconductored circuits would be energized in spring of 2017. Work may be delayed or stopped

due to weather or other unforeseeable circumstances, which may extend the end of construction date. Most construction activities are anticipated to occur during a 16-month period, beginning in summer of 2015.

Table 4.17-2: Existing, Planned, and Proposed Projects within 5 Miles presents a list of existing, planned, and proposed projects in the project vicinity. As shown in the table, most other projects identified as potentially occurring within the same timeframe are located 0.5 mile or farther from the project corridor. However, the following seven PG&E projects potentially could occur in approximately the same timeframe as the Vaca Dixon-Lakeville 230 kV Reconductoring Project:

- Vaca Dixon-Davis 115 kV Conversion
- Vacaville Bank 1
- Tulucay 230/60 kV Transformer No. 1 Capacity Increase
- Napa-Tulucay No. 1 60 kV Line Upgrade
- Lakeville-Petaluma 60 kV Replacement
- Lakeville 230/60 kV Replacement

The Suscol Mountain Vineyards and Napa Pipe projects in Napa County are the only other projects located within 0.5 mile of the Vaca Dixon-Lakeville 230 kV Reconductoring Project that would have potentially overlapping construction schedules. The Suscol Mountain Vineyards, Napa Pipe, and PG&E projects listed previously would be expected to implement minimization measures similar to those incorporated into the reconductoring project, as provided in Section 3.9, Applicant-Proposed Measures. Those minimization measures would include meeting air quality requirements, coordinating work activities with the responsible agencies, and implementing applicable best management practices. Such practices would further reduce the less-than-significant contributions to cumulative impacts from the project.

One helicopter landing zone (LZ-112) and staging area for the reconductoring project is located on the southwest corner of the Napa Pipe site. PG&E's temporary construction site overlies several elements of the Napa Pipe Project—a hotel site and light industrial area, both slated for development as part of Phase 1, and a future park and open space area and a light industrial area, both slated for installation as part of Phase 2 (Napa County 2012a). Although the Napa Pipe Project has been delayed and revised multiple times since project plans were first submitted to the county in 2007, this project received its first land use approval in June 2013. In negotiating the terms of temporary use of the site, PG&E would work with the landowner to coordinate construction of the two projects, and thus would minimize the potential for cumulative impacts. PG&E has also incorporated other landing zones and staging areas along the transmission line that could be used in lieu of the Napa Pipe Site in the event that the development project conflicts with the PG&E proposed use of a staging area on the property.

Significant and unavoidable cumulative impacts on air quality in the Bay Area Air Quality Management District and Yolo-Solano Air Quality Management District, respectively, have been identified for the Napa Pipe and Brighton Landing projects.

Table 4.17-2: Existing, Planned, and Proposed Projects within 5 Miles

#	Project Name	Location	Proximity to Vaca Dixon-Lakeville Project	Project Type	Approximate Size	Status	Anticipated Construction Schedule	
							Begin	End
1	Vaca Dixon-Davis 115 kV Conversion	Solano County	0 miles (Vaca Dixon Substation)	Electrical line conversion	Approximately 40 Circuit Miles	Approved	Unknown	12/31/2017
2	Vacaville Bank 1	Solano County	0 miles (Vaca Dixon Substation)	Electrical	0	Approved	Unknown	12/31/2015
3	Highway 12- Jameson Canyon Road Widening Project	State Route 12, Solano County	3.1 miles	Caltrans road improvements	5.8 miles	Approved	Unknown	August 2015
4	Brighton Landing Specific Plan	Vacaville	3.8 miles	Residential mixed-use development	217 acres	Proposed	Unknown	Unknown
5	Tulucay 230/60 kV Transformer No. 1 Capacity Increase	Napa County	0 miles (Tulucay Substation)	Electrical	0	Approved	Unknown	05/31/2015
6	Napa-Tulucay No. 1 60 kV Line Upgrade	Napa County	0 miles (starts at Tulucay Substation)	Electrical line upgrade	Approximately 4 circuit miles	Approved	Unknown	05/31/2015
7	Napa Pipe	City of Napa	Same parcel as LZ-112 helicopter landing zone	Mixed-use residential development	154 acres	Partially approved	Unknown	Unknown
8	Suscol Mountain Vineyards	Napa County	Spanned	Vineyard expansion	438 acres	Approved	April 2014	October 2015
9	Syar Napa Quarry Expansion	Napa County	0.65 mile	Quarry expansion	291 acres	Proposed	Unknown	Unknown
10	Health and Human Services Agency Campus Project	Napa County	2.4 miles	Rebuilding of campus	184,000 square feet	Phase 1 approved	2014	2015

Table 4.17-2: Existing, Planned, and Proposed Projects within 5 Miles

#	Project Name	Location	Proximity to Vaca Dixon-Lakeville Project	Project Type	Approximate Size	Status	Anticipated Construction Schedule	
							Begin	End
11	Alexander Crossings Apartments Project	City of Napa	2.9 miles	Multi-family residential	6.4 acres	Proposed	Unknown	Unknown
12	Lakeville-Petaluma 60 kV Replacement	Sonoma County	0 miles (starts at Lakeville Substation)	Electrical	0	Approved	Unknown	12/31/2014*
13	Lakeville 230/60 kV Replacement	Sonoma County	0 miles (starts at Lakeville Substation)	Electrical	0	Approved	Unknown	12/31/2014*
14	Deer Creek Village	Petaluma	2.67 miles	Mixed-use retail, office, and recreational	36.5 acres	Approved	2012	February 2014*
15	East Washington Place	Petaluma	2.4 miles	Commercial/ office space	33.7 acres	Approved, under construction	Unknown	July 2013*
16	Riverfront	Petaluma	2.2 miles	Mixed-use development	35.7 acres	In review	Unknown	Unknown
17	Dutra Haystack Landing Asphalt and Recycling Facility	Sonoma County	0.75 mile	Asphalt and recycling facility expansion	38 acres	Unknown	Unknown	Unknown
18	Davidon Homes	Petaluma	3.9 miles	Residential subdivision	60 acres	DEIR review period	Unknown	Unknown
19	North River Landing	Petaluma	3.2 miles	Mixed-use development	4.1 acres	Approved	Unknown	Unknown

Note:

* Project will likely be completed before Vaca Dixon-Lakeville Project, but is included in case the schedule is delayed such that the projects overlap.

Although the construction timing for these projects it still uncertain, some construction activities are reasonably foreseeable for either or both projects to coincide with the construction activities of PG&E's reconductoring project. If the construction schedules were to overlap, the reconductoring project would temporarily contribute further air pollutant emissions. However, with implementation of APMs, net emissions would pose a negligible increase over existing conditions and would not contribute substantially to an existing or projected air quality violation or non-attainment for a monitored criteria pollutant.

Implementing the reconductoring project would cause temporary construction-related greenhouse gas (GHG) emissions; however, the intent, purpose, and function of the project align with the goals of the Assembly Bill 32 Scoping Plan to reduce GHG emissions and protect against the detrimental effects of climate change. The reconductoring project would provide the necessary infrastructure to achieve large-scale reductions in GHG emissions by electrifying existing industrial processes.

The reconductoring project has been designed to avoid impacts on most special-status species. Potential impacts on California red-legged frog would be addressed in consultation with the U.S. Fish and Wildlife Service as part of the U.S. Army Corps of Engineers consultation responsibilities under the Endangered Species Act. Any potential for incidental take of this species associated with the project's temporary construction impacts would be addressed and mitigated as required during this consultation.

PG&E would obtain coverage under the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Construction Activities and would implement a Storm Water Pollution Prevention Plan, as required by law, to minimize temporary impacts on water quality from soil disturbance, hazardous materials, and hazardous wastes. In addition, a California Department of Fish and Wildlife Lake or Streambed Alteration Agreement, State Water Resources Control Board Section 401 Water Quality Certification, and U.S. Army Corps of Engineers Section 404 nationwide permit would be obtained. PG&E would follow the measures specified in each permit to minimize potential impacts on water quality.

Habitat would be disturbed temporarily during construction. Potential cumulative impacts on biological resources would be short term and less than significant. Permanent impacts of project construction would be limited to the installation of culverts or rocked fords. Because of the small amount of fill occurring over multiple locations, project construction would not result in substantial adverse effects on federally protected wetlands, as defined by Section 404 of the Clean Water Act. Therefore, the project would not constitute a considerable contribution to cumulative impacts.

Construction of the reconductoring project would not result in significant transportation or traffic impacts. Construction activities may generate temporary and periodic increases in traffic on interstate highways, state routes, and local roads. With implementation of standard construction practices, the overall construction impact would be less than significant. Traffic impacts for the Napa Pipe Project and Health and Human Services Campus Project have been identified as significant. However, because of the location of the reconductoring project relative to other pending projects in Solano and Napa counties, the transportation network would be sufficient to distribute construction traffic to avoid significant impacts on any one specific area.

Future operation and maintenance activities for the reconductoring project would not differ from ongoing activities for operation of the existing Vaca Dixon-Lakeville transmission line corridor. No cumulative impacts would occur from operation of the project.

Therefore, the reconductoring project would not have environmental impacts that would be individually limited but cumulatively considerable. Under these criteria, the impact of the reconductoring project would be less than significant.

Question 4.17d – Direct or Indirect Environmental Effects on Human Beings – Less-than-Significant Impact

The reconductoring project would not adversely affect human beings, either directly or indirectly. Potential construction impacts associated with human health would include the presence of hazards, use of hazardous materials, potential for wildland fires, and temporary air quality impacts. As discussed previously, construction impacts on air quality and those related to hazards and hazardous materials would be less than significant. PG&E would implement APMs to further reduce the potential for adverse effects. The Vaca Dixon-Lakeville 230 kV Reconductoring Project would have a beneficial effect on human beings in the project area by increasing electrical service reliability and ultimately reducing GHG emissions by encouraging increased electrification of existing industrial processes.

4.17.1 REFERENCES

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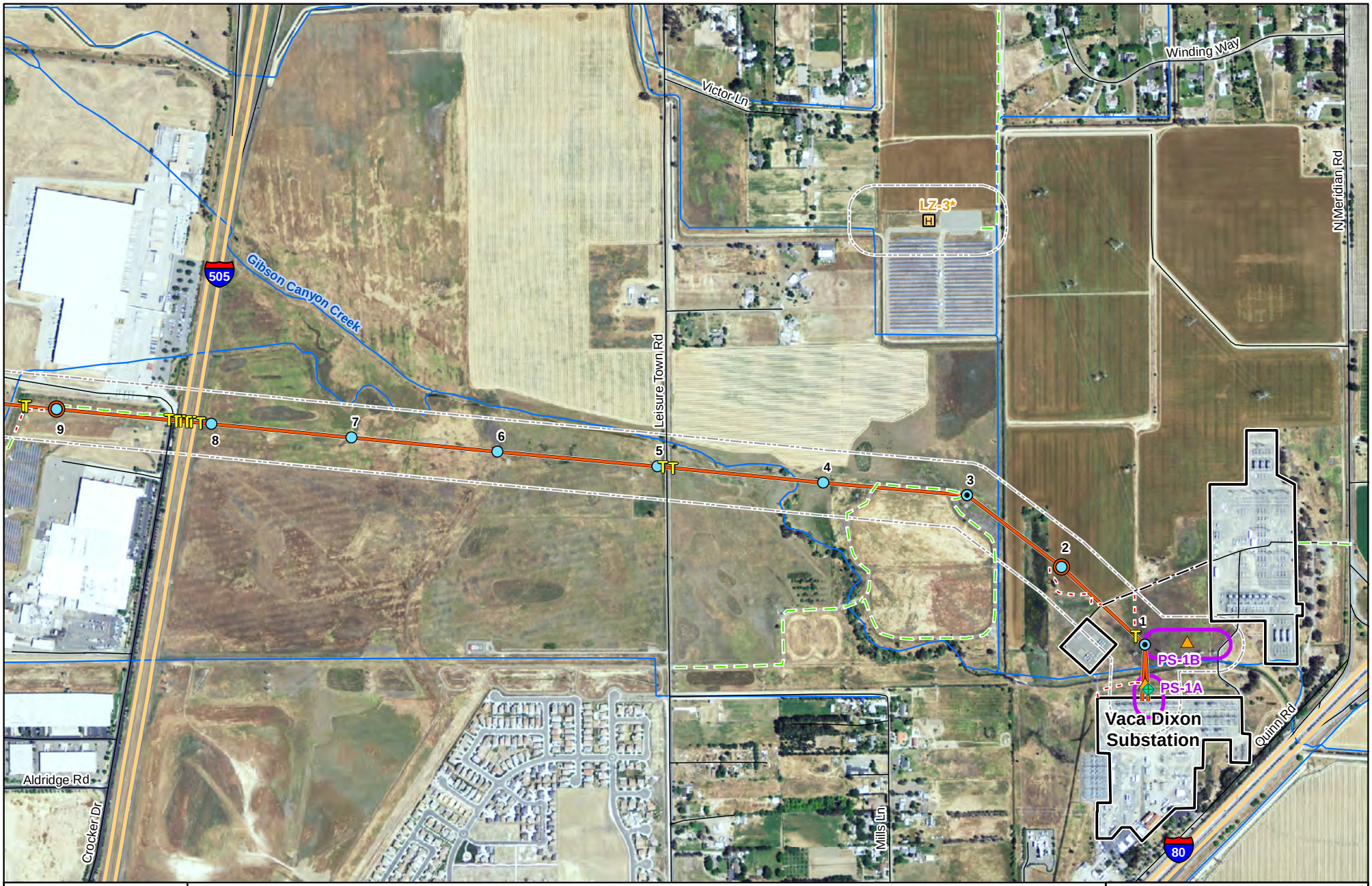
ATTACHMENT A:
PROJECT ROUTE MAPS



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1 inch = 1,000 feet
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N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

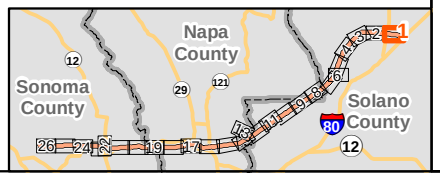
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Other
- Study Area

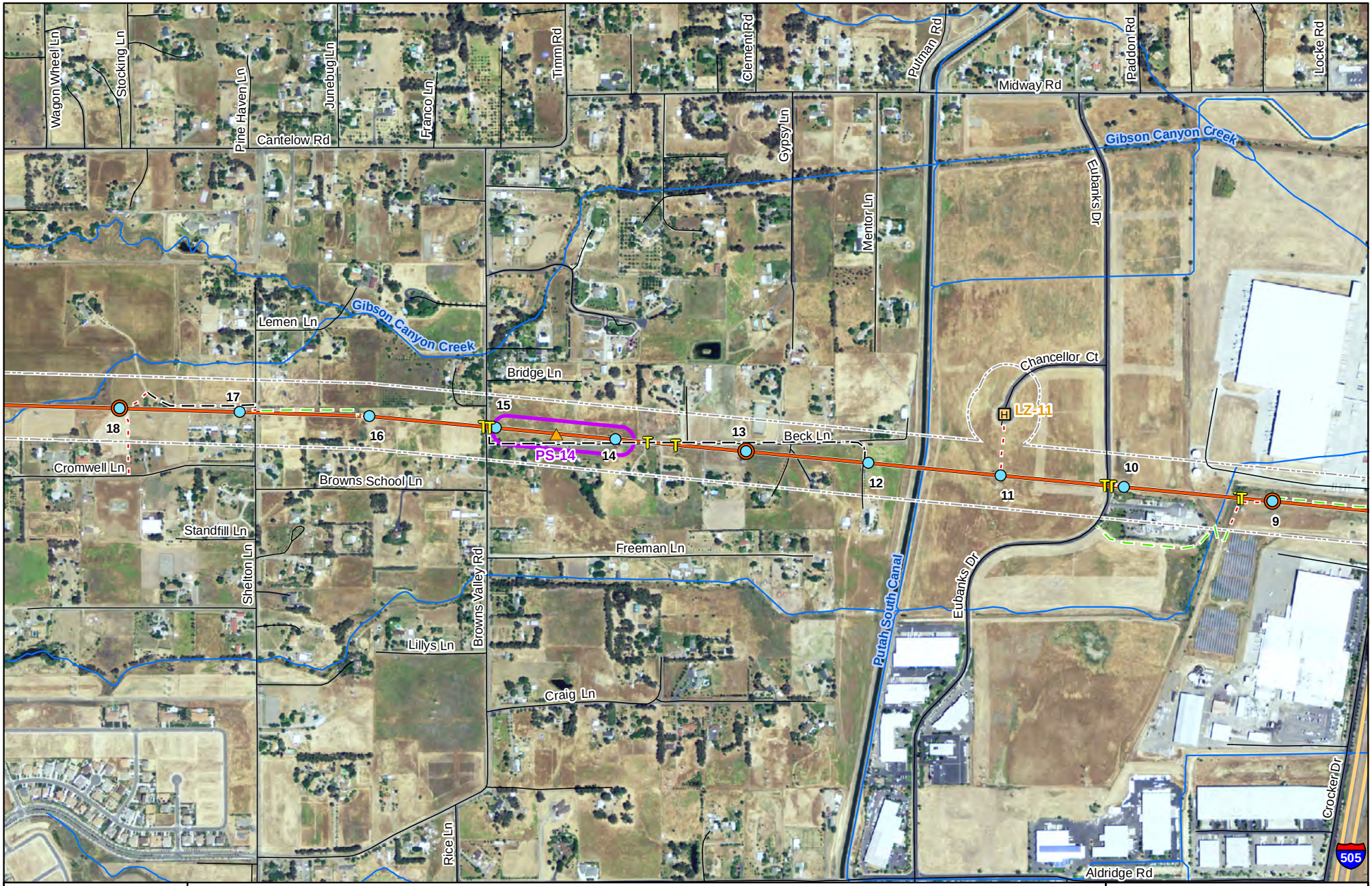
Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (1 of 26)



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1 inch = 1,000 feet

1:12,000

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Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

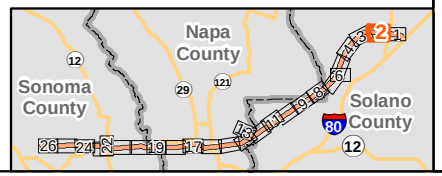
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Other
- Study Area

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (2 of 26)

Feet
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1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

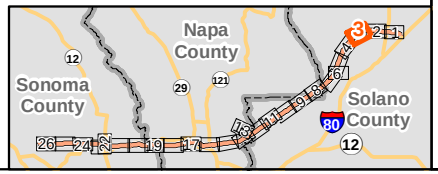
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (3 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

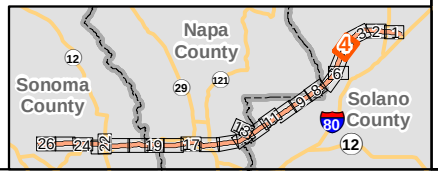
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (4 of 26)

Feet
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1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
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- Substation

Proposed Features
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- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
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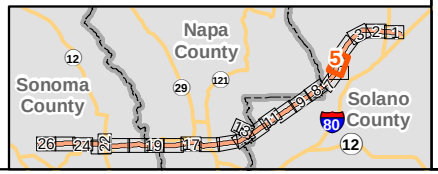
- Existing Unpaved Road
- Overland Route

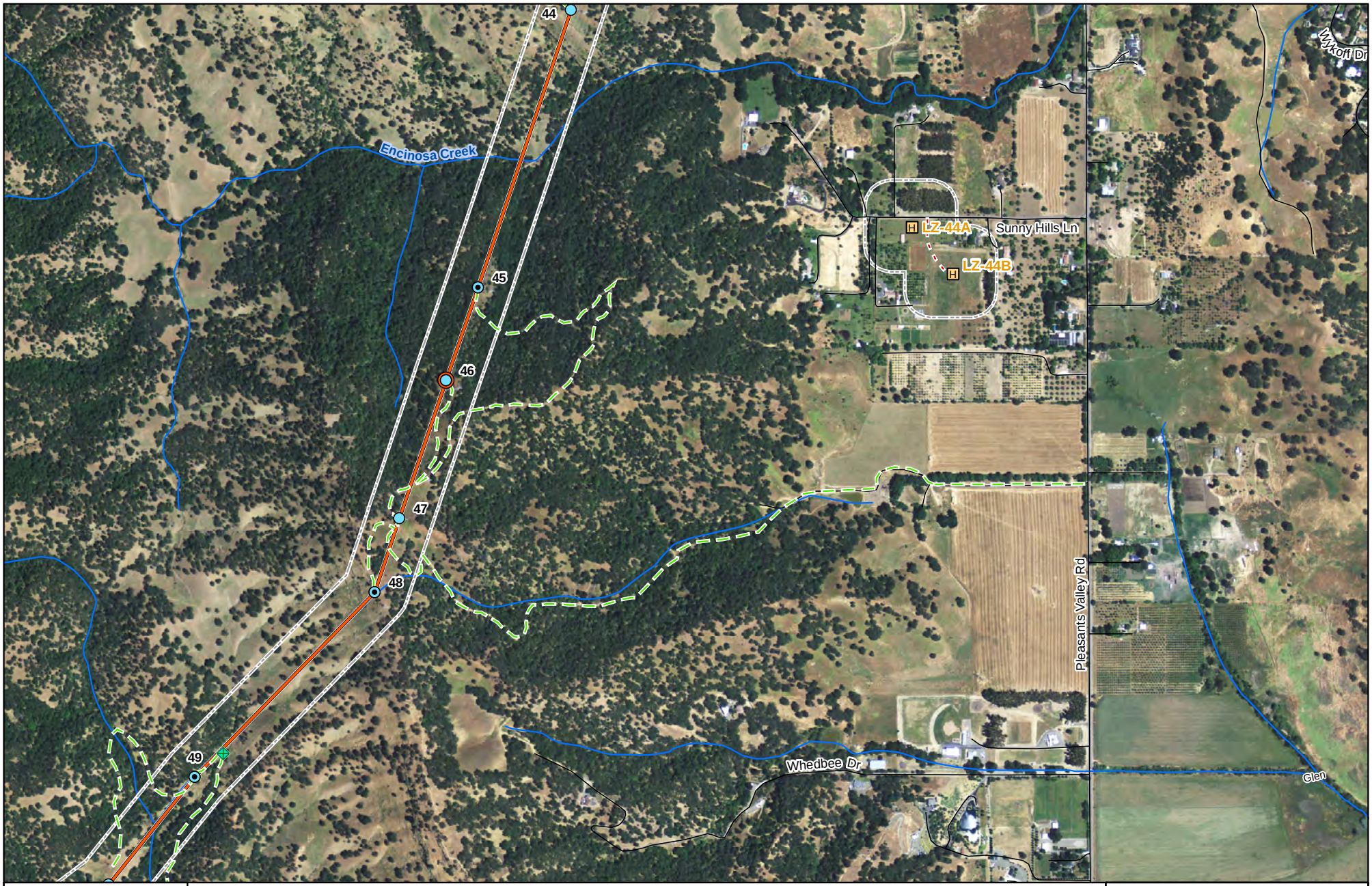
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (5 of 26)



0 250 500 1,000 Feet

1 inch = 1,000 feet

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Pacific Gas and Electric Company

AECOM

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- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

Proposed Features
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- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
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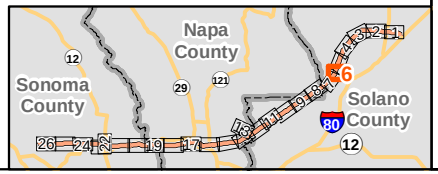
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Other
- Study Area

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (6 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

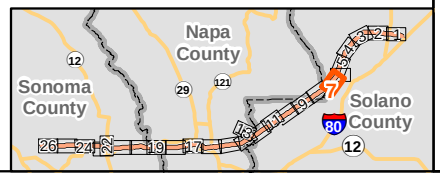
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Other
- Study Area

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (7 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

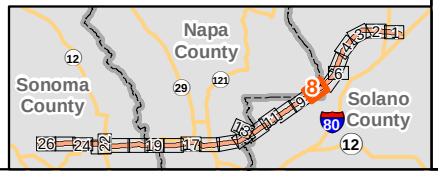
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

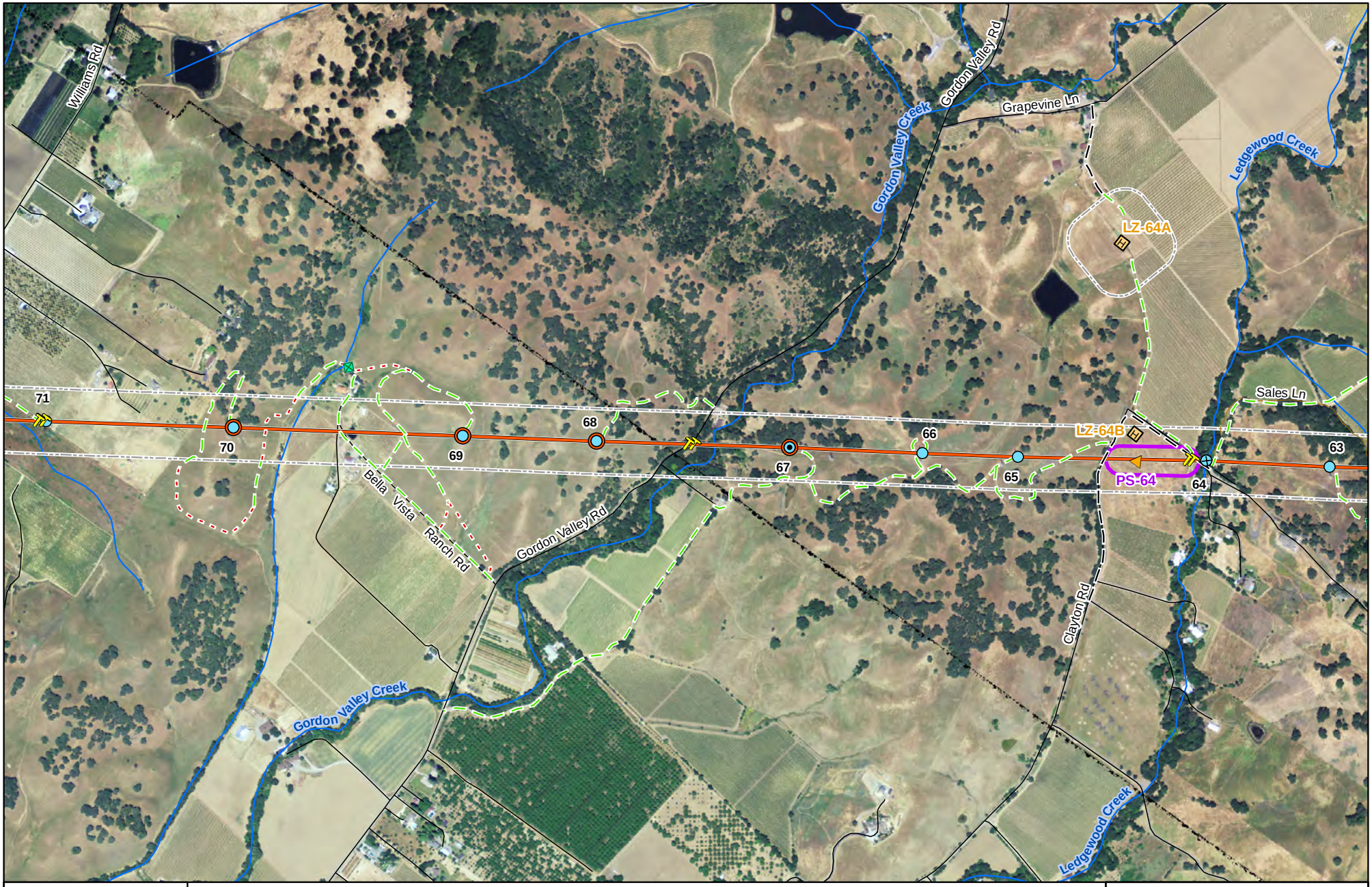
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (8 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

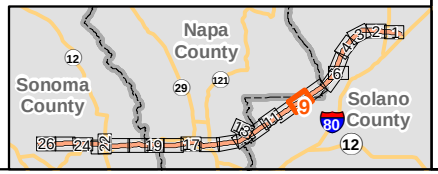
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

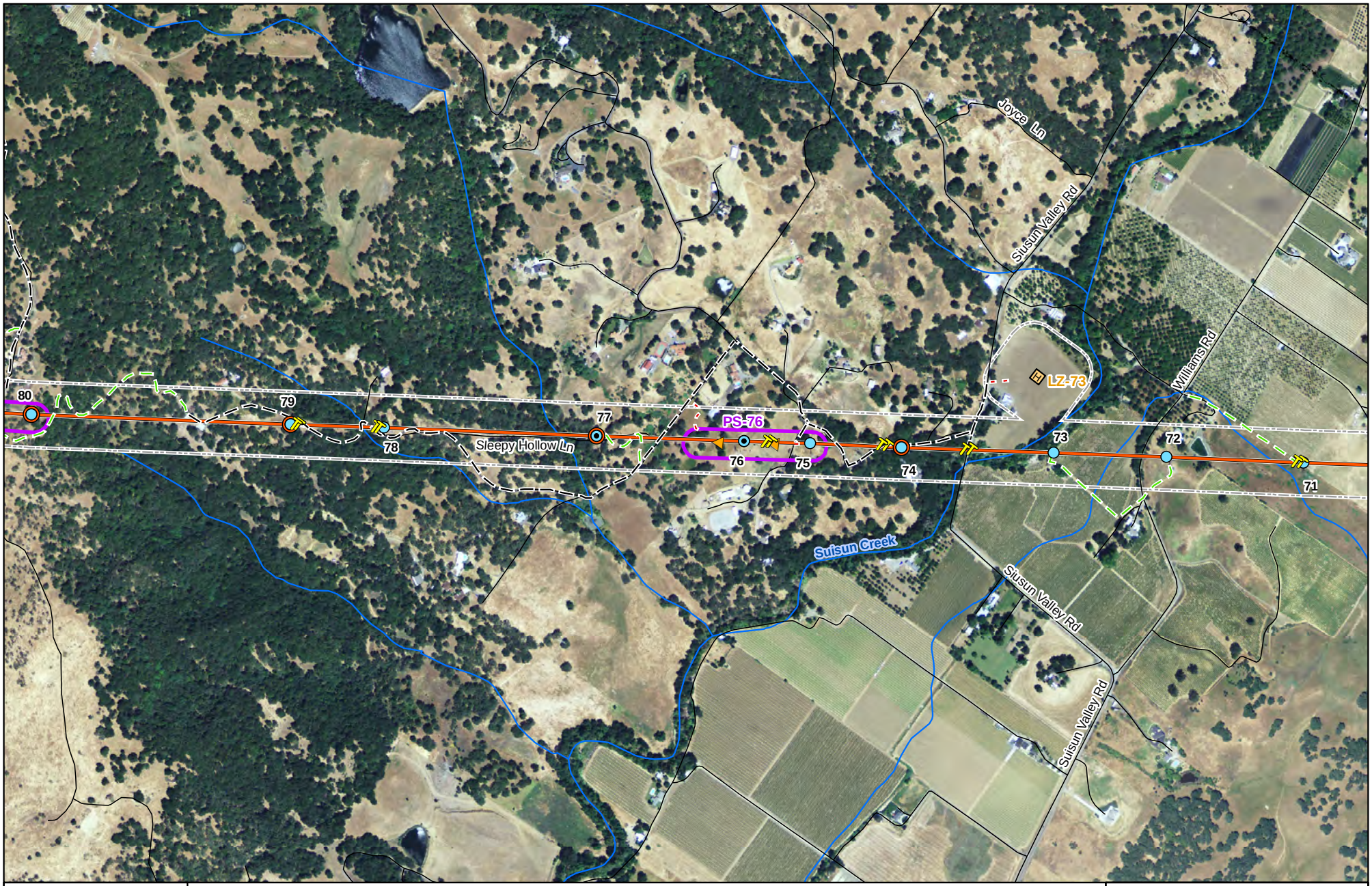
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (9 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

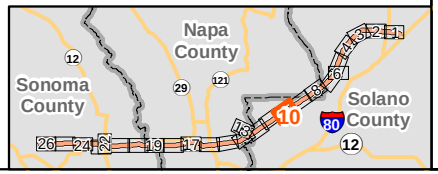
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

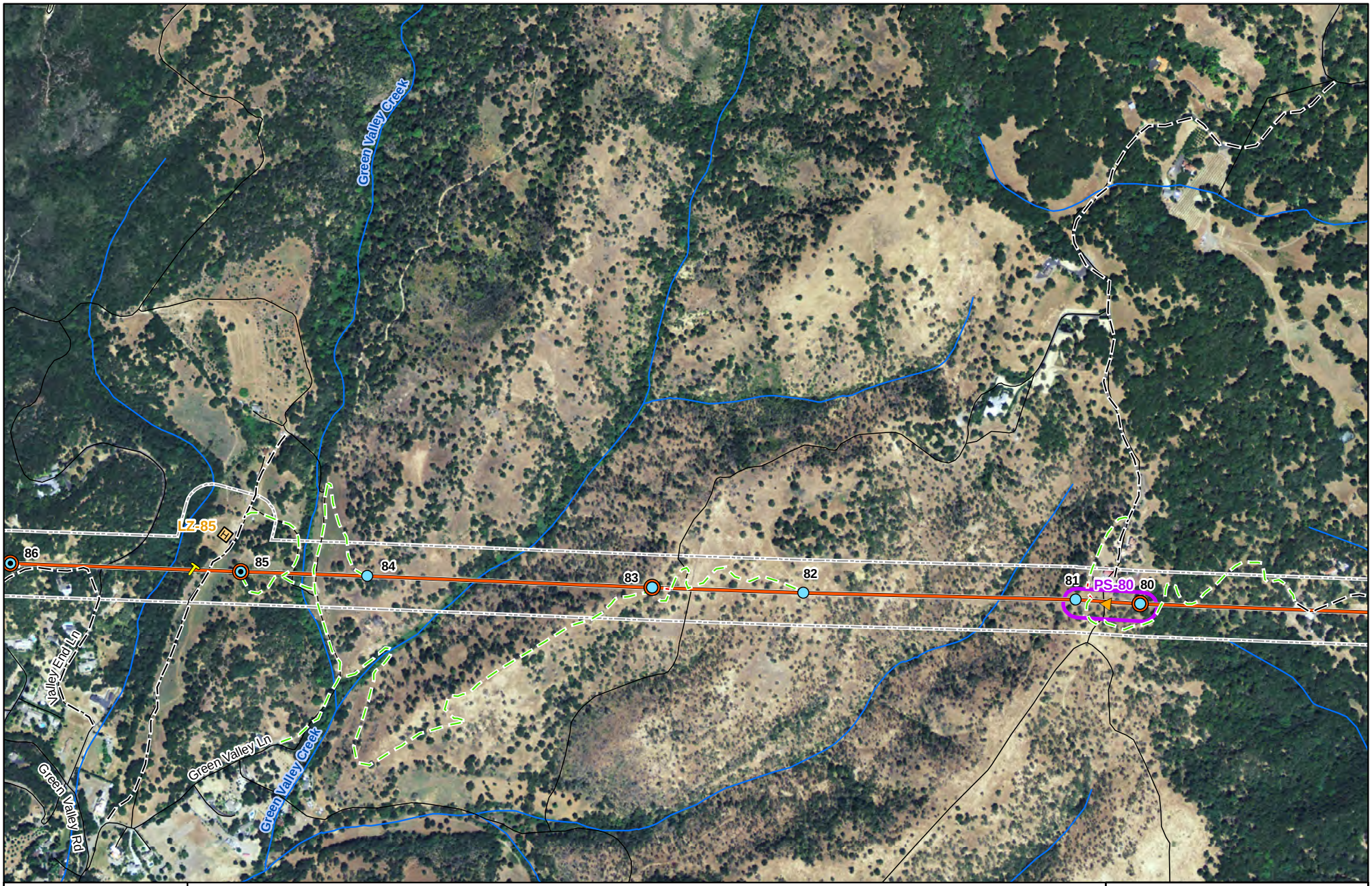
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (10 of 26)



0 250 500 1,000 Feet

1 inch = 1,000 feet

1:12,000

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

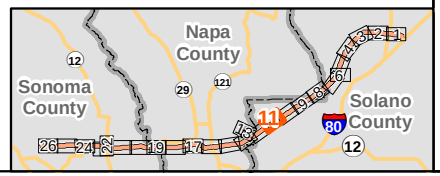
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (11 of 26)

0 250 500 1,000 Feet

1 inch = 1,000 feet

1:12,000

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

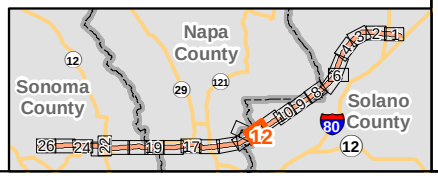
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (12 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

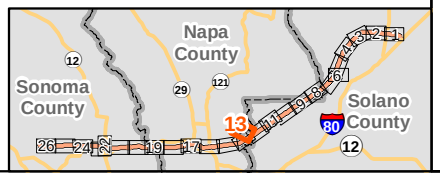
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (13 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

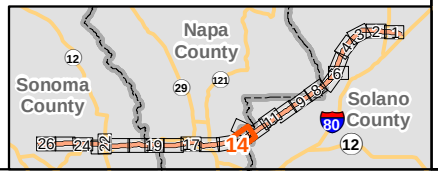
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

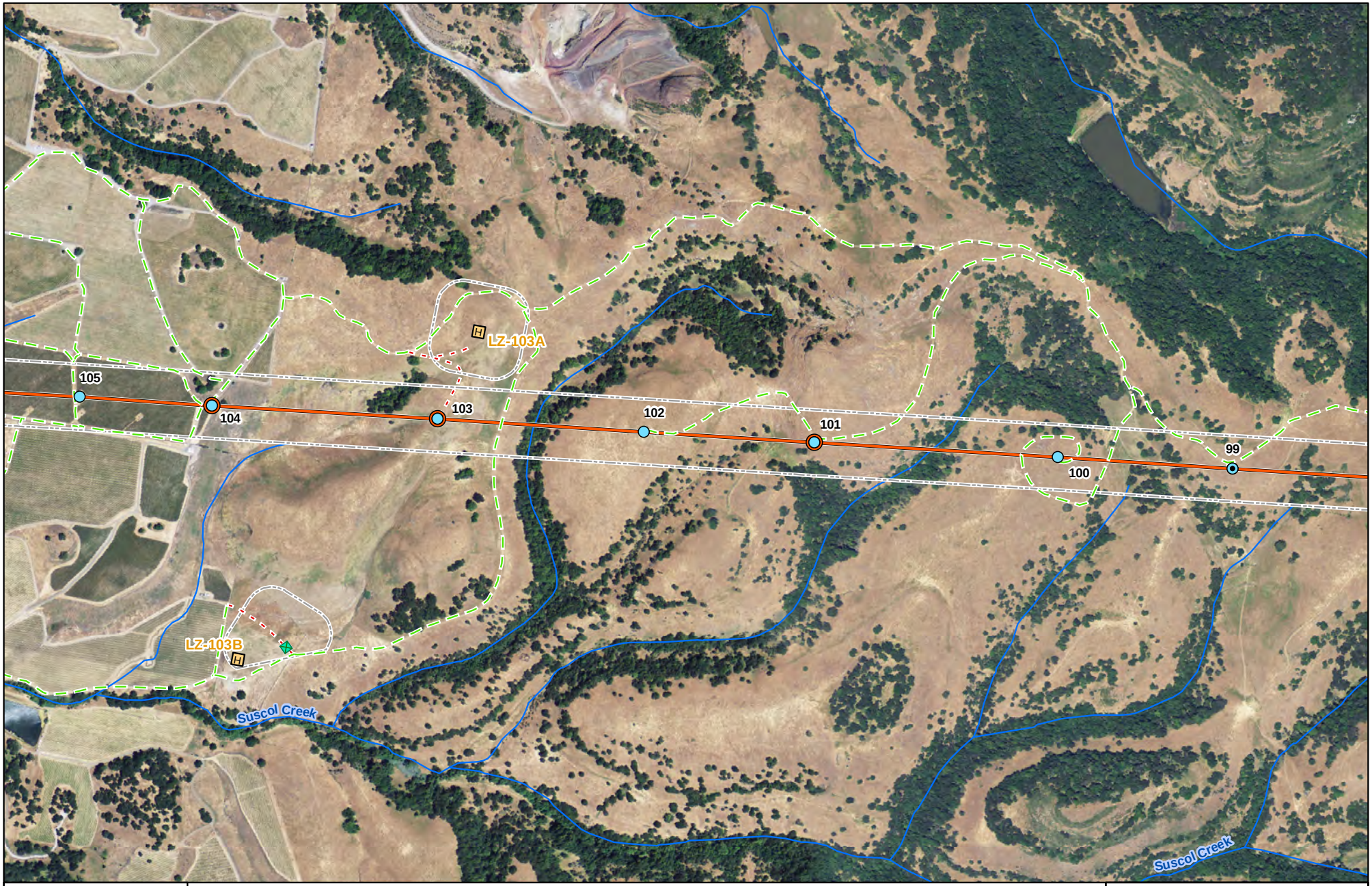
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (14 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company
AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

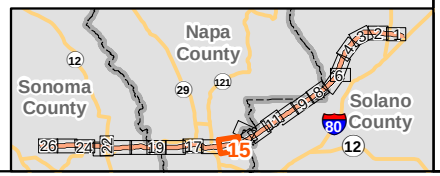
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

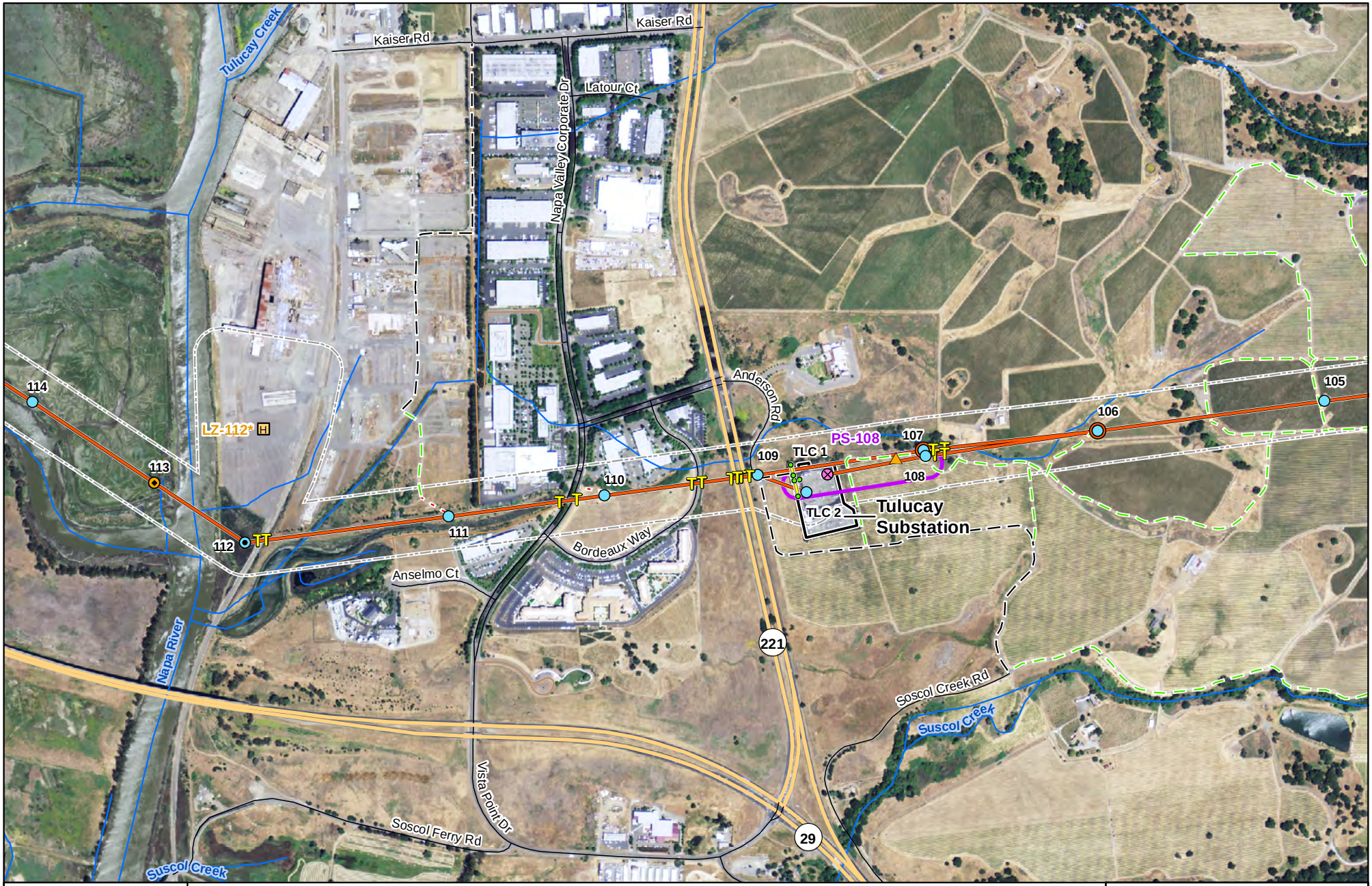
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (15 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

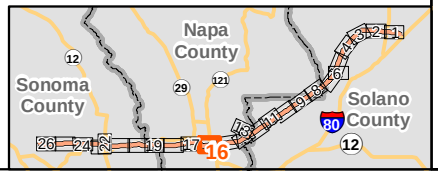
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Other
- Study Area

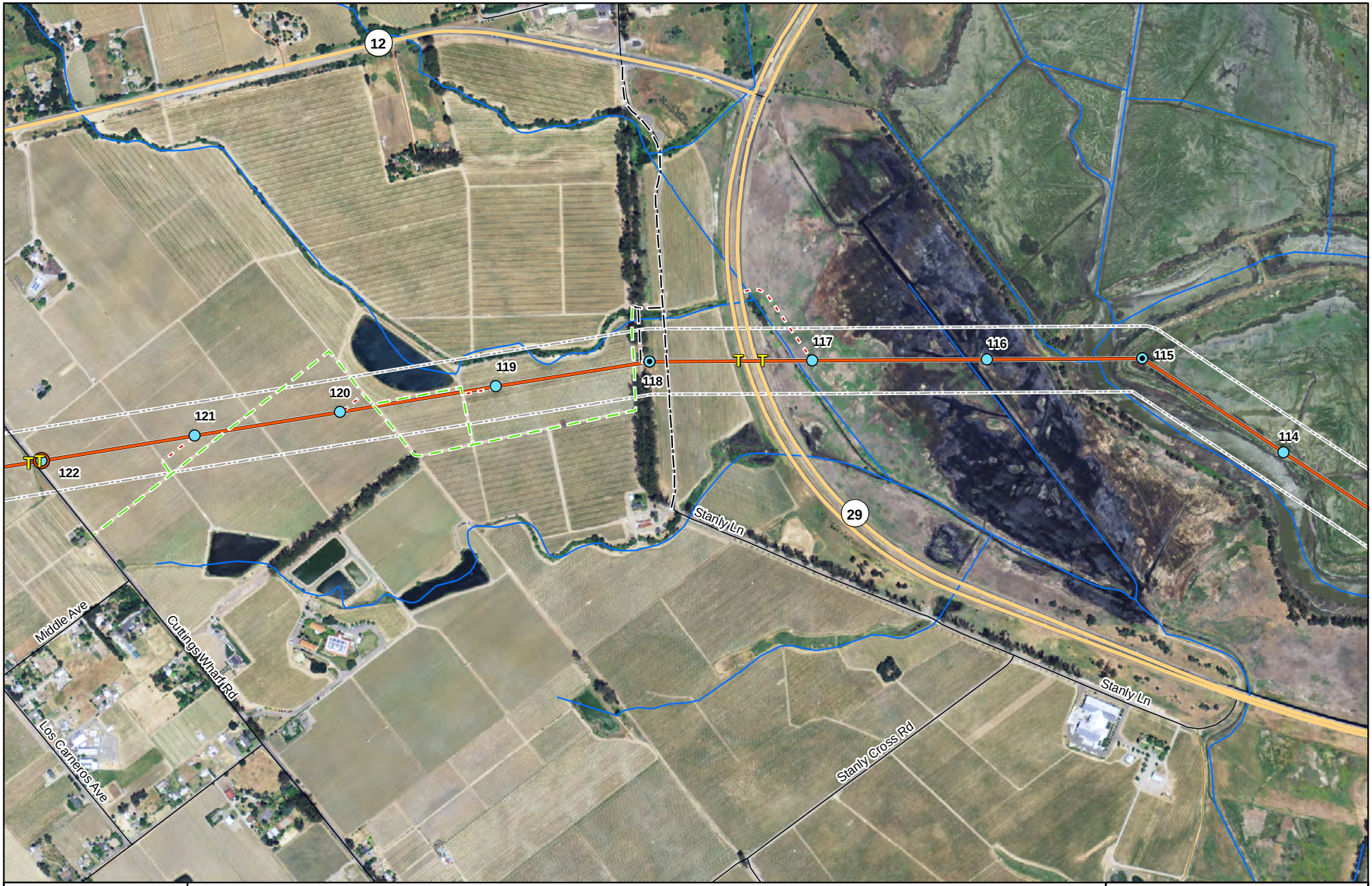
Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (16 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

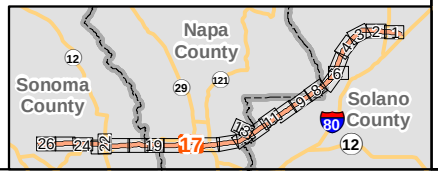
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

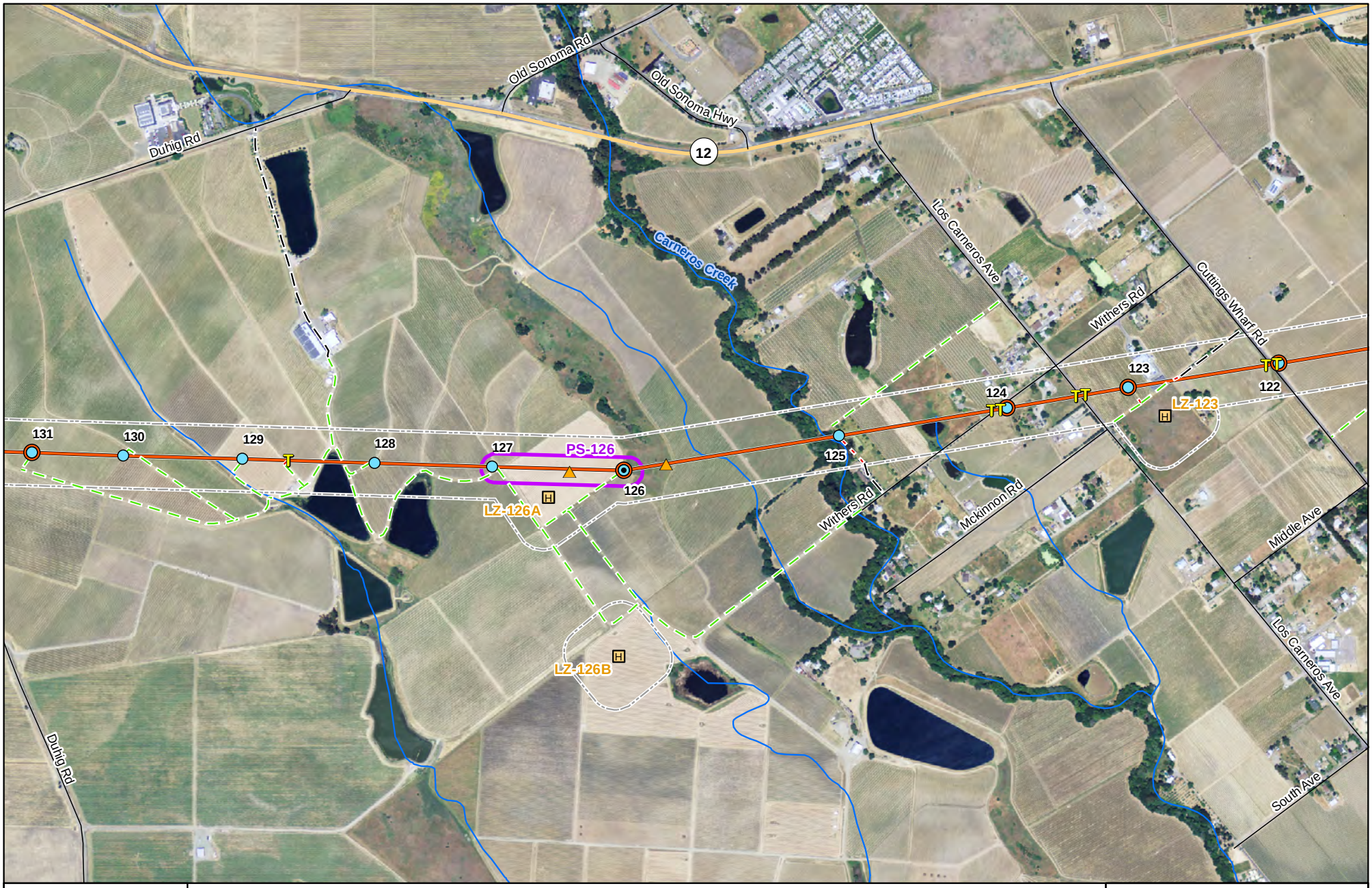
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (17 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

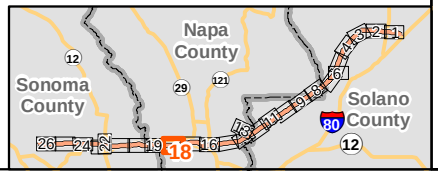
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (18 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

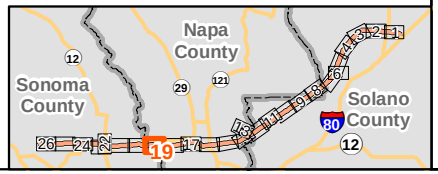
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (19 of 26)

0 250 500 1,000 Feet

1 inch = 1,000 feet

1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

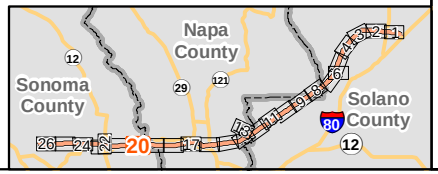
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Other
- Study Area

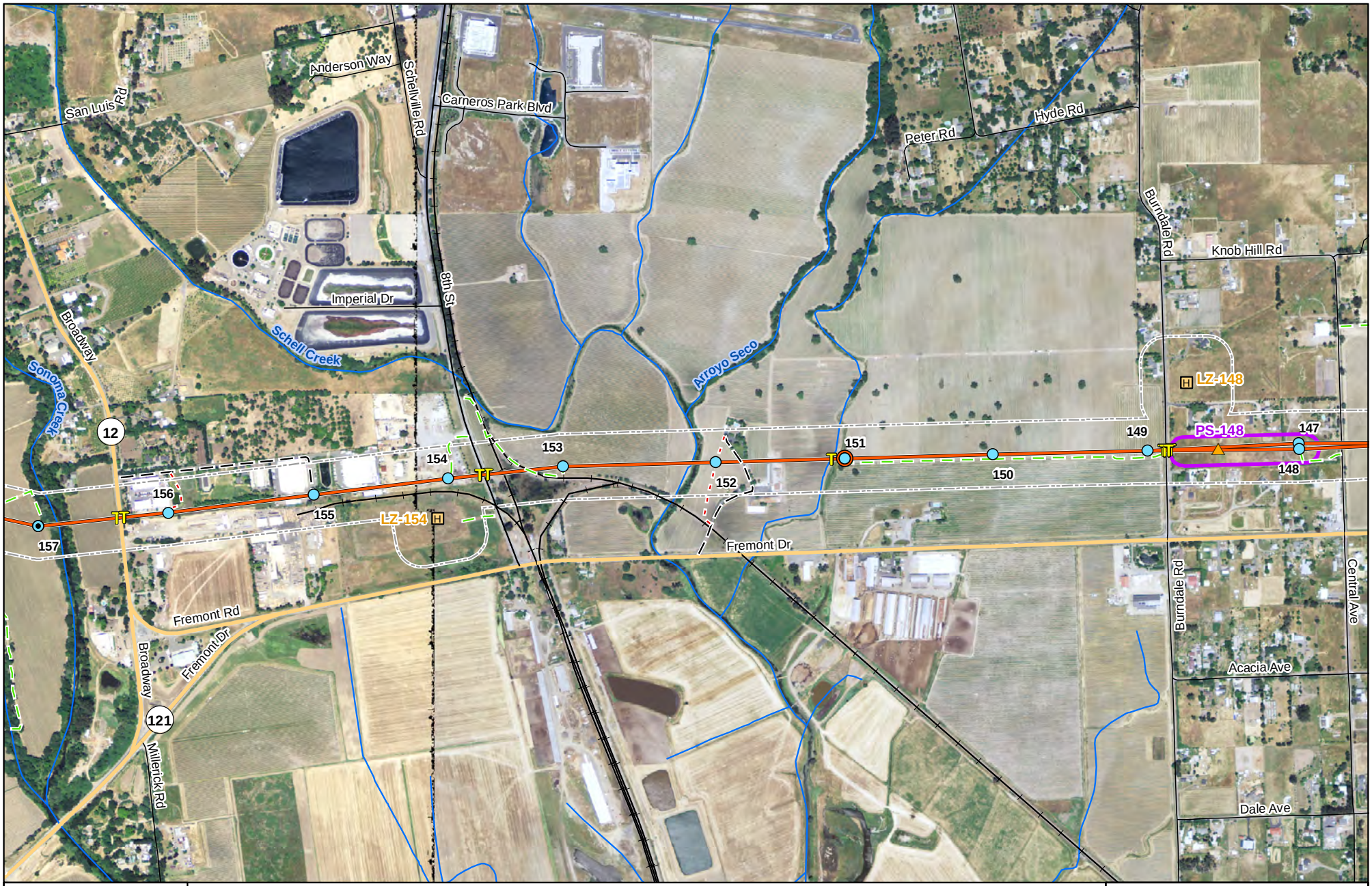
Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (20 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

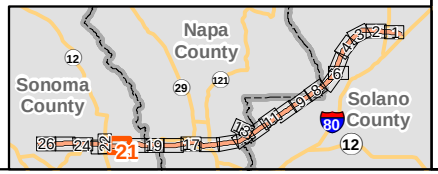
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (21 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

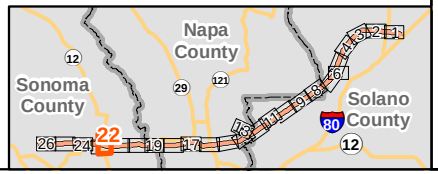
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (22 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

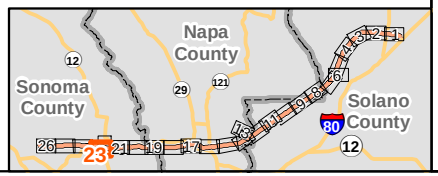
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (23 of 26)

Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

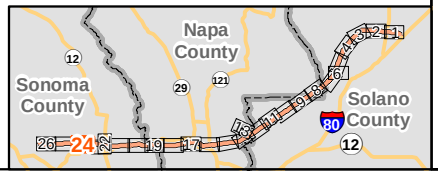
Proposed Features
- Existing Tower to be Converted to Floating Dead End Tower
- New Tubular Steel Pole
- Cage-Top Extension

Temporary Features**
- Guard Structure
- Landing Zone
- Snub Pole
- Potential Pull Site Siting Area
- Shoo Fly Pole
- Shoo Fly Line

Culvert Crossing
- Potentially Jurisdictional

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

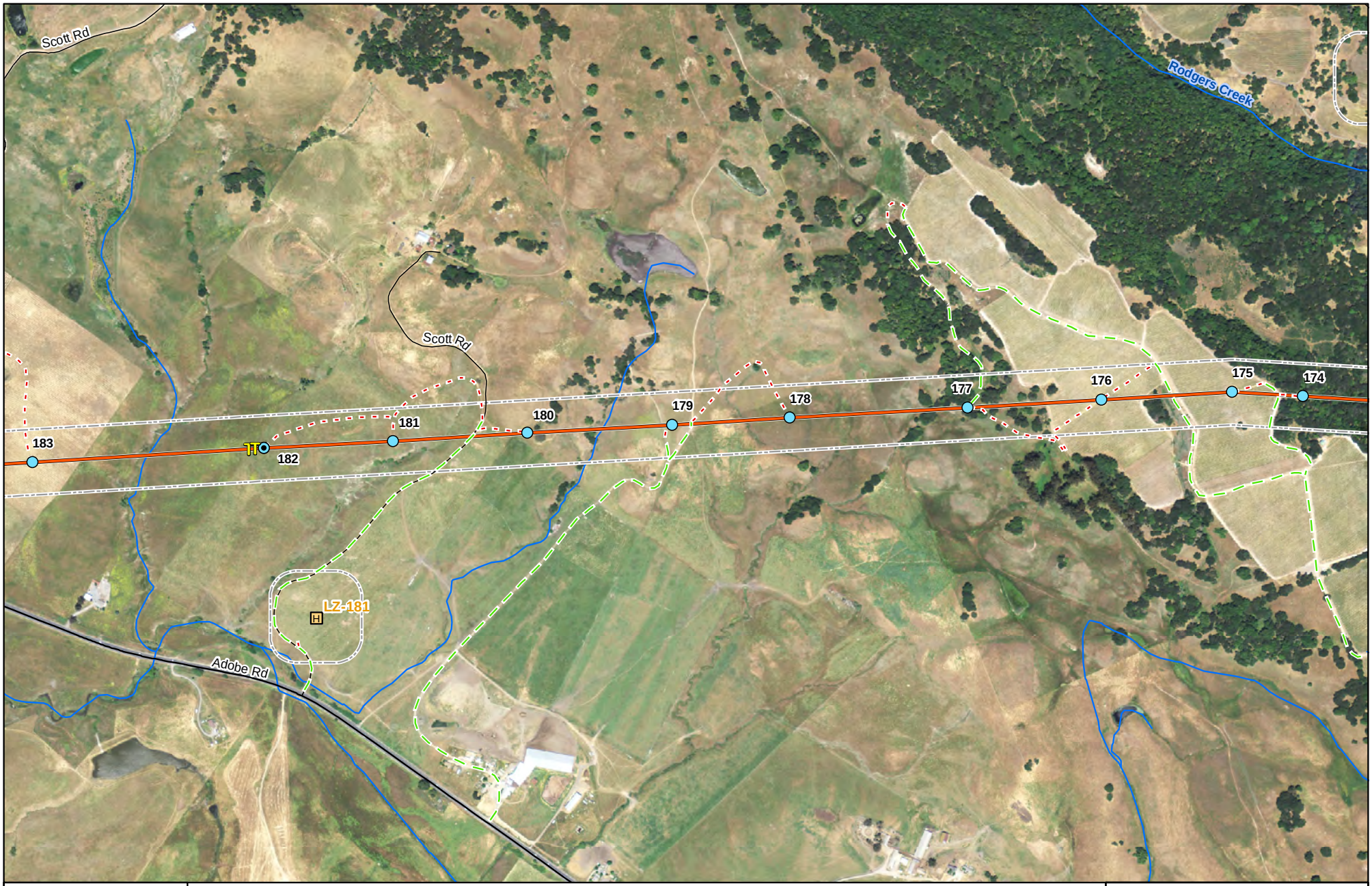
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (24 of 26)



Feet
0 250 500 1,000
1 inch = 1,000 feet
1:12,000

N

Pacific Gas and Electric Company

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Project Access
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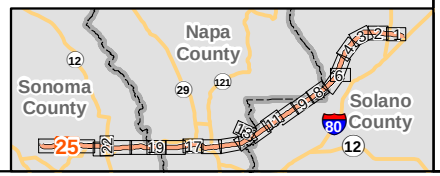
Other
- Study Area



* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (25 of 26)

0 250 500 1,000 Feet

1 inch = 1,000 feet

1:12,000

N

Pacific Gas and Electric Company

AECOM

Existing Features
- Tubular Steel Pole
- Dead End Tower
- Steel Lattice Tower
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Substation

Proposed Features
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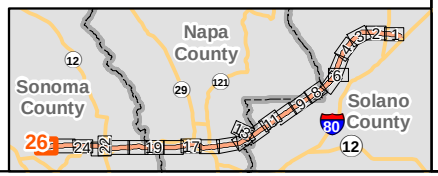

* = Landing Zone will also be utilized as a Staging Area.
** = Locations are approximate and may be modified based on final design.

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment A: Project Route Map (26 of 26)

ATTACHMENT B:
ANTICIPATED CONSTRUCTION EQUIPMENT

Equipment	Use
1/2-ton pickup trucks	Transport construction workers
3/4-ton pickup trucks	Transport construction workers
Crew-cab trucks (3/4-ton to 1-ton trucks)	Transport construction workers
Jeep vehicles	Transport construction and environmental inspectors
Road grader, 6-wheel	Site grading
Dozer with sheepsfoot	Grading/shaping and soil compaction/tensioning support
Powered road roller	Subgrade compaction
ASV mower	Vegetation clearing
Water trucks	Dust and fire control
Cranes	Tower installation and reconductoring (one at each end)
2-ton flatbed trucks	Hauling materials
Flat-bed boom truck	Hauling and unloading materials
Dump trucks (5-ton to 10-ton trucks)	Hauling spoil and import materials
Construction trucks and trailers (2-ton to 60-ton trucks and trailers)	Hauling materials
Tiltbed and lowboy trailers	Hauling equipment
Rigging truck	Hauling tools and equipment
Mechanic truck	Servicing and repairing equipment
Shop vans	Storing tools
Crawler-mounted auger	Excavating foundations
D6 and D8 bulldozer	Site grading and excavating
Puller (semi-truck and trailer)	Pulling conductor wire
Tensioner (semi-truck and trailer)	Pulling conductor wire
Helicopters (Bell 500 Long Ranger, Bell 205 Huey)	Tower transport/installation, cage-top extensions transport/installation, personnel and material delivery
Semi with wire reel trailer	Hauling wire
Air compressor	Operating air tools
Air tampers	Compacting soil around foundations
Portable generators	Supplying electricity to power tools for tower assembly
Fuel trucks	Refueling equipment (helicopters)

Equipment	Use
Aerial lift trucks	Stringing conductor wire
Fork lifts	Managing and assembling material at the laydown area
Large bucket trucks	Pulling sites, insulator replacement, reconductoring
Water trucks	Dust control and compaction at grading locations
Standard line bucket trucks	Reconductoring activities
Fire suppression equipment	Protecting laydown areas and landing zones

ATTACHMENT C:
VISUAL RESOURCES TECHNICAL STUDY

Visual Resources Technical Study

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Solano, Napa and Sonoma Counties, California

September 2013

Prepared for
AECOM
and
Pacific Gas and Electric Company
by
Environmental Vision

Contents

Figures

1.0 INTRODUCTION

Environmental Vision prepared this visual resources technical study to address the Pacific Gas & Electric Company's Vaca Dixon-Lakeville 230 kV Reconductoring Project (hereinafter referred to as the project). The visual evaluation is based upon field observations and site photography conducted in October and November 2012 and review of technical data including project maps, aerial and ground level photographs, topographic maps and pertinent public planning documents. A set of figures including representative photographs and computer-generated visual simulations are presented following the text portion of this document.

For purposes of this study, visual or aesthetic resources are generally defined as both the natural and built features of the landscape that are seen and that contribute to the public's appreciation of the environment. Visual resource or aesthetic impacts are generally defined in terms of a project's physical characteristics and potential visibility and the extent to which its presence will alter the perceived visual character and quality of the environment. This evaluation focuses on the project's potential impacts on public views.

The Project proposes reconductoring of approximately 40 miles of existing transmission line that connects Vaca Dixon Substation in Fairfield in Solano County to the Lakeville Substation at the edge of Petaluma in Sonoma County. Approximately 190 existing transmission towers are located within the project route; the project includes installing an extension to the top of 39, or slightly more than 20 percent, of the existing towers. These cage-top extensions will be either 15'-0" or 16'-5" tall, raising the height of the cross arms accordingly. Figure 1a depicts a typical elevation drawing that shows the lattice tower structures with proposed modifications. Existing structures will be replaced at two substations; at Tulucay Substation a light duty steel pole will be replaced with a tubular steel pole (TSP), and at Lakeville Substation one existing H-frame lattice structure will be replaced with a tubular steel H-frame structure. Figures 1b and 1c show typical elevation drawings of these structures. Replacement of conductors and insulators is also proposed; however their appearance will not be noticeably different than the existing components.

This study describes existing visual conditions and potential project-related impacts on visual resources. The changes in the appearance of the project area that will result from the proposed minor modifications of the existing line will not substantially alter the existing visual character or quality of the project route and surrounding area. Implementation of Applicant Proposed Measures described in this study will further reduce any minor, aesthetic effects.

2.0 ENVIRONMENTAL SETTING

The existing project alignment lies in northern California, north of Suisun and San Pablo bays, the tidal estuaries that form the northern extension of San Francisco Bay. The eastern terminus of the alignment is located in the city of Vacaville, which is located at the western edge of the Sacramento Valley and is part of the larger Central Valley. From there, the alignment extends approximately 40 miles west through Solano, Napa, and Sonoma counties (Figure 2: Regional Landscape Context, Landscape Units, and Key Observation Points). The alignment follows the southern end of the Sonoma and Vaca mountains, which are part of the Central Coast Ranges, then crosses the Napa and Sonoma valleys and terminates at the edge of Petaluma Valley. In general, the existing alignment traverses a landscape that is diverse in character, ranging from areas with high levels of

human modification, including agricultural land and suburban residential development, to rural, rugged hilly terrain.

At its eastern end, where the project alignment lies in the Sacramento Valley, a grid of roadways and canals provides a physical and visual framework for the area's overall land use development pattern. The central portion of the alignment is dominated by the largely undeveloped, sparsely populated, and wooded Vaca Mountains. Picturesque, rolling agricultural terrain at the northern edge of San Pablo Bay that supports vineyards, pastures, and field crops characterizes the western portion of the project area. Elevations along the project range from approximately 2 feet (near the Napa River) to 1,360 feet (in the Vaca Mountains).

The existing project alignment crosses or lies near several local and regional roadway corridors. Interstate 80 provides a major east-west connection in the area between the inner San Francisco Bay area and Sacramento and points farther east. Interstate 505 (I-505) provides a north-south transportation link between Vacaville and northern portions of the Central Valley. To the west, U.S. Highway 101 provides a north-south connection between San Francisco and Petaluma and Santa Rosa to the north. State highways and rural roads further connect local communities. The project area is visible from places along nearby public roadways.

Throughout the project area, electric utility structures (including substations and overhead power lines) are established landscape features.

2.1 Project Viewshed

The project viewshed is defined as the general area from which a project is visible.

For purposes of describing a project's visual setting and assessing potential visual impacts, the viewshed can be broken down into three distance zones: foreground, middleground, and background. The foreground is defined as the zone within 0.25 to 0.5 mile of the viewer. Landscape detail is most noticeable and objects generally appear most prominent when seen in the foreground. The middleground is a zone that extends from the foreground up to 3–5 miles from the viewer, and the background extends from approximately 3 to 5 miles away to infinity (Smardon et al. 1986).

For the purpose of this analysis, the potential effects on foreground viewshed conditions are emphasized, particularly those areas within 0.25 mile of the project alignment. Because of intervening vegetation and terrain, views of the existing alignment are partially or fully screened from many locations in the area. Where the alignment can be seen by the public, viewing conditions range from foreground unobstructed views to relatively rugged, forested terrain with partially screened views. The alignment is not visible in its entirety from any single viewing location given its overall length, the height of structures, and the presence of intervening vegetation.

2.2 Landscape Units and Representative Views

The project's foreground viewshed has been divided into three distinct sub-areas or landscape units for purposes of documentation and description (Table 1 Summary of Landscape Units). Figure 2: Regional Landscape Context, Landscape Units, and Key Observation Points delineates the project alignment and landscape units, and Figure 3: Photograph Viewpoint Locations shows the locations of photograph viewpoints. Figures 4a through 4m: Representative Photographs of Project Route

and Vicinity presents a set of 26 photographs that portray representative visual conditions and public views in the project area.

Table 1: Summary of Landscape Units

Landscape Unit	Length (approximate)	Primary Affected Viewers	Representative Photographs	Visual Simulations
Eastern—Northern edge of Vacaville	7.5 miles	Motorists Residents at rural/suburban edge of Vacaville	1 through 7 Figure 4a through 4d	Figures 5 and 6
Central—Rugged hillsides between Vacaville and Napa	15 miles	Few Motorists Residents in Green Valley and rural Solano County	8 through 13 Figure 4d through 4g	Figure 7
Western—Napa River to Petaluma	18 miles	Motorists Residents in rural Napa and Sonoma Valleys and at the edges of Napa, Sonoma, and Petaluma Recreationalists	14 through 26 Figures 4g through 4m	Figures 8 through 12
Source: Data compiled by Environmental Vision in 2012				

Eastern Unit- Northern edge of Vacaville (Photographs 1 to 7)

This Landscape Unit begins at Vaca Dixon Substation in northern Vacaville at the western edge of the Sacramento Valley and continues for approximately 7.5 miles west to the base of the Vaca Mountains, a range that separates Napa and Solano Counties. This area is characterized by the Sacramento Valley's relatively level terrain and a mixture of scattered rural residences and suburban residential development, and open, agricultural fields. This unit also includes the English Hills, which parallel the higher Vaca Mountains and extend into the valley. The existing alignment crosses several watercourses including the Putah South Canal near I-505, Ulatis Creek in Vaca Valley, and Alamo Creek at the eastern edge of the Vaca Mountains.

Located at approximately 85 feet in elevation, Vaca Dixon Substation lies along I-80 near North Meridian Road. Five transmission lines supported by lattice steel towers run west from the substation. One of these lines lies adjacent and parallel to the project alignment for approximately 15.5 miles. As the alignment extends from the substation, it crosses I-505, passing an area with warehouses, new suburban development, and rural areas at the edge of Vacaville. Photographs 1 and 2 are largely unobstructed views from I-505 looking toward the alignment. Photograph 3 shows the alignment where it crosses a rural residential area at the northern edge of Vacaville. Just west of Gibson Canyon Road, the alignment turns southwest and passes through the English Hills, a hilly grass-covered area with scattered oaks that lies at an elevation of approximately 750 feet

(Photographs 4 through 6). Photographs 5 and 6 (views within the English Hills taken from Steiger Hill Road and Serenity Hills Road, respectively) show that undulating terrain partially screens some of the existing towers; however, open views toward the alignment and an adjacent transmission line are available from places along local roads in this area. The alignment continues through Vaca Valley, the valley that separates the English Hills from the Vaca Mountains, passing near the edge of the City of Fairfield. Photograph 7, from Pleasants Valley Road, a Solano County scenic route, near Vaca Valley Road, shows a relatively unobstructed view toward the existing project towers and an adjacent transmission line. After crossing Pleasants Valley Road, the alignment ascends into the Vaca Mountains.

The primary viewers in this landscape unit are motorists using regional roads including I-80 and I-505. In addition, a concentration of suburban and rural residences located on the northern and western edges of Vacaville and Fairfield lie in proximity to the existing alignment.

Central Unit- Rugged terrain between Vacaville and Napa (Photographs 8 to 13)

From the northwestern edge of Vacaville, this Landscape Unit extends southwest almost 15 miles to the edge of the City of Napa, crossing mountains and ridges and crossing several times the Solano/Napa county line. Elevations along this portion of the project alignment range between approximately 145 feet and 1,360 feet. Nearby peaks include Okell Hill at 1,129 feet and the two Twin Sisters peaks at 2,259 and 2,177 feet in elevation.

Vegetation in this landscape unit is a mixture of chaparral and oak woodland. Mature trees and rolling topography provide considerable screening. At lower elevations, the existing project alignment traverses valleys with vineyards and pastures. It also crosses several creeks that flow south from a higher elevation, including Suisun Creek, Ledgewood Creek, and Green Valley Creek. The alignment also passes near Suisun Reservoir. For the most part, this unit is sparsely populated and undeveloped; however, the alignment lies near rural residences located in level valleys where it also passes close to several small wineries. Within approximately the eastern half of this landscape unit, from Pleasants Valley Road to just west of Suisun Valley Road, the alignment runs parallel to another transmission line that is supported by lattice steel towers.

Taken from Gordon Valley Road, Photograph 8 shows rolling hillsides and towers visible beyond the vineyards seen in the foreground. Photographs 9 through 11 are views within rural Suisun Valley from Suisun Valley Road, a Solano County scenic route. From some roadway locations the existing towers are distinctly visible on the hills above this valley where they appear against a combination of landscape and sky backgrounds. Photographs 9 and 10 show the gently rolling terrain of the northern part of this valley and include transmission towers and overhead lines seen against a landscape background. Photograph 11 from further south on Suisun Valley Road, shows towers that are barely perceptible because of the greater viewing distance and the wooded hillside backdrop. Photographs 12 and 13 are views from the hillside community of Green Valley. Taken from the northern edge of Green Valley, Photograph 12 shows that the existing towers are visible from some locations in this wooded hillside area. By contrast, Photograph 13, a view from Green Valley Road at Rockville Road near the Green Valley Golf Course, indicates that topography and/or dense, mature vegetation screen views from many other locations within this community. Before reaching Tulucay Substation, the project alignment passes through Skyline Wilderness Park, an 850-acre park. Although the alignment lies more than 1.5 miles from the developed west end of the

park, it crosses a loop segment of the San Francisco Bay Area Ridge Trail that lies on contiguous private land with access provided via public parkland.

Primary viewers in this landscape unit are local motorists using lightly-traveled rural roads. A limited number of scattered hillside residences lie near the existing alignment with the greatest concentration in the northern part of the hillside community of Green Valley. Viewers also include visitors to the area's wineries and hikers using a loop segment of the Ridge Trail.

Western Unit- Napa River to Petaluma (Photographs 14 to 26)

The longest of the three units, the Western Landscape Unit extends approximately 17.5-miles and includes southern portions of the cities of Napa, Sonoma, and Petaluma in addition to rolling agricultural/vineyard landscapes at the edges of these cities. This portion of the existing project alignment traverses the Napa, Carneros, and Sonoma valleys, as well as the southern toe of the Sonoma Mountains. Elevations range from near sea level at the Napa River to 480 feet near the base of the Sonoma Mountains. Within this landscape unit, the alignment crosses several rivers and creeks, including the Napa River, Carneros Creek, Huichica Creek, Fowler Creek, and Schell Creek, all of which flow south into San Pablo Bay, located approximately 10 miles from the alignment.

Rolling pastures, cropland, and vineyards contribute to a rural agricultural landscape that includes isolated rural residences and residential communities. From some locations, unobstructed views toward nearby hills and the project alignment as well as other transmission lines are available.

Photograph 14, taken from State Route (SR)-221, shows a view toward Tulucay Substation with vineyards in the foreground and mountains in the backdrop. From Tulucay Substation, the project alignment runs west across a commercial/industrial area in the City of Napa near the edge of the Napa River. This area includes a resort hotel, offices, and industrial facilities. Situated nearly at sea-level, this low-lying, alluvial plain landscape includes marshlands and sloughs along the Napa River. Relatively unobstructed close-range and middleground views of the alignment are available from roadways and other public viewing locations in this area. Photograph 15 shows a view of the Napa River Valley from the Grape Crusher sculpture scenic vista point near SR-12/SR-29. This view includes distant mountains, sloughs, and wetlands as well as the towers (on the left) and part of the light colored resort hotel in the foreground (on the right). John F. Kennedy Memorial Park, a 350-acre park in the city of Napa, about 0.7 mile north of the project area, includes the Napa Municipal Golf Course, ball fields, picnic areas, a dirt-bike course, and walking trails. Photograph 16, taken from a trail located within this park, shows a view across the river toward the alignment. The existing steel lattice towers and the SR-12/SR-29 bridge over the Napa River are visible against the sky, and cranes at an industrial facility also are visible on the left. In this vicinity, the alignment also crosses the Southern Pacific Railroad.

After spanning the Napa River, the project alignment crosses SR-12/SR-29, a Napa County scenic route and one of the main north-south highways in the area. It then traverses rolling agricultural terrain comprised of vineyards that are bordered periodically by mature tree hedgerows and riparian vegetation. In this area, the alignment runs roughly parallel to SR-12, a two-lane Sonoma and Napa County scenic route; existing towers are visible intermittently from places along this roadway. Photograph 17, a view from SR-12 near Los Carneros Avenue and the Carneros Inn Resort, shows relatively level agricultural landscape in the foreground with two towers seen against the sky in the background. The alignment continues west, passing scattered rural residences and crossing various local roadways. Photograph 18, taken from Los Carneros Avenue, shows where the alignment

crosses this rural residential road in Los Carneros Valley. In Photograph 19 from Duhig Road, existing towers are partly visible within the rolling vineyard landscape, near Huichica Creek. From many locations in this area, public views are partially screened by mature vegetation and topography.

The existing project alignment follows the southern base of the ridge that separates Sonoma and Napa Valleys. Photograph 20 is a view seen briefly by motorists traveling along SR-12 near Haire Lane, a residential cul-de-sac. South of the City of Sonoma, the alignment crosses SR-12 twice near the town of Schellville; the alignment runs parallel to and within 0.5 mile of this roadway through Sonoma County. In this area, the alignment passes residential and industrial development including lumberyards, the Northwestern Railroad, and a dairy facility. Photograph 21, a view from SR-12 near a smaller rural residential roadway called Burndale Road, shows vineyards in the foreground with existing towers visible against a backdrop of mountains and sky beyond.

As the project alignment continues, it crosses SR-116 twice; Photographs 22 through 24 show the alignment from this two-lane Sonoma County scenic route. Photograph 24, a view from SR-116 near Arnold Drive and the currently closed Arroyo Golf Course, includes mature trees and the Sonoma Mountains in the backdrop. In the area between Sonoma and Petaluma river valleys, the alignment traverses the southern end of the Sonoma Mountains where it reaches an elevation of approximately 600 feet. It continues through sparsely populated agricultural land to the edge of the City of Petaluma where it terminates at Lakeville Substation along two-lane Old Adobe Road, a Sonoma County scenic route. The substation lies adjacent to Adobe Creek Golf and Country Club, and approximately 600 feet from Petaluma Adobe State Historic Park and historic site. A suburban residential area of Petaluma is about 0.35 mile northeast of the substation. Photograph 25, from Old Adobe Road near Frates Road shows the last towers of the line as well as a portion of the substation. Photograph 26, from Old Adobe Road at the entrance to the state park, shows lattice towers at the end of the alignment as well as towers supporting other transmission lines. Part of the substation also appears on the right. Dense, mature trees partially screen views toward the alignment and substation from further north along the roadway and from much of the park. Views of the existing alignment from the adjacent Adobe Creek Golf and Country Club are also partially or fully screened by mature trees.

Primary viewers in this unit are motorists traveling on regional roads including SR-12 and SR-116 or on various rural roadways. In this area, roadways are generally moderately to well-traveled, and motorists include local travelers and tourists visiting the wine country. In addition to passing several wineries and resorts, this portion of the existing project alignment passes residences located at the edges of Sonoma, Napa, and Petaluma as well as in rural areas between these cities.

2.3 Potentially Affected Viewers

Within the project viewshed there are three primary types of potentially affected viewers—roadway motorists, residents, and recreationalists.

Motorists, the largest viewer group, include people traveling on regional roads including I-505, I-80, SR-12, SR-121, and SR-116 as well as various local roads. Motorists include a variety of roadway travelers—both local and regional travelers who are familiar with the visual setting, and travelers using the roadway on a less regular basis including tourists visiting the nearby Sonoma and Napa wine growing region. Affected views are generally brief in duration, typically lasting less than a few minutes. Viewer sensitivity is considered low to moderate.

The second viewer group includes nearby residents in the vicinity. Residences at the edges of Vacaville, Fairfield, Napa, Sonoma, and Petaluma as well as scattered rural residences lie in proximity to the existing project alignment; the largest concentration is in Vacaville where the alignment passes near new suburban development at the northern edge of the city. As discussed in Section 2.2, Landscape Units and Representative Views, open views toward the existing alignment and other power lines are available from residences at many locations; however, in other locations, such as in the Vaca Mountains, mature trees and topography limit or completely screen most residential views. Residential views tend to be long in duration, and the sensitivity of this viewer group is considered moderate to high.

Recreationalists, the third group, include people using parks and trails such as John F. Kennedy Memorial Park, Petaluma Adobe State Historic Park, and Skyline Wilderness Park as well as golf courses, private resorts, and nearby wineries. Recreational views tend to be brief or moderate in duration, and the sensitivity of this viewer group is moderate to high.

2.4 Overview – Public Policy and Regulatory Framework

CPUC Decision 95-08-038 states that local governments have no discretionary authority over utility power transmission line or substation projects (CPUC 1995, p. 13). A summary of public policies pertinent to visual quality is provided in Appendix A for informational purposes.

No federal laws, ordinances, or regulations pertain to visual resources in the project area. The project route travels through unincorporated areas of Solano, Napa, and Sonoma County as well as the cities of Vacaville and Napa. Applicable plans, policies, and regulations, which pertain to visual quality for these areas are presented Appendix A. The project involves minor modifications to an existing transmission line and does not conflict with any of these adopted environmental plans, policies, or regulations pertaining to aesthetics.

3.0 EVALUATION

3.1 Applicant Proposed Measures (APMs)

As part of this project, PG&E will implement the following APMs to further minimize less-than-significant impacts on aesthetics and visual resources:

APM-AE-1: Temporary Nighttime Construction Lighting

Temporary lighting required for nighttime construction will be focused on work areas and directed on site to minimize potential effects with respect to nearby sensitive receptors.

3.2 Visual Simulations

A set of eight "before" and "after" visual simulations depict the reconductoring project's appearance as seen from key public viewpoints along the existing project alignment within the three landscape units. The simulations were produced using digital photography and computer-modeling and rendering techniques. The images are based on Project data provided by PG&E Project engineers.

The location of each simulation view is shown in Figure 2: Regional Landscape Context, Landscape Units and Key Observation Points, and Figure 3: Photograph Viewpoint Locations. Table 2: Summary of Simulation Views presents an overview of the visual simulations in terms of the location of each viewpoint, visual changes depicted, and approximate viewing distance to the nearest visible modified project structure. As summarized in Table 2 and described in the following subsections and demonstrated by the set of visual simulations of the project alignment from key viewpoints, the overall project changes will not substantially degrade the existing visual character or quality of the landscape setting. In addition, the reconductoring project will not conflict with local policies pertaining to visual quality, described in Appendix A: Public Policy and Regulatory Framework. Therefore, the visual impact will be less than significant.

The following discussion is presented by landscape unit and contains an evaluation of the reconductoring project's potential visual effects on key public views, as represented by the visual simulations.

Eastern Landscape Unit

The reconductoring project will include tower raises on nine of the existing 36 towers located within the Eastern Landscape Unit. Two key observation points show project-related visual changes within this approximately 7.5-mile-long unit.

The most densely populated of the three landscape units, the Eastern Unit, is a portion of the Sacramento Valley, which has relatively level topography. The nine towers requiring cage-top extensions will be visible from locations along scenic roadways or residential areas that are primarily concentrated at the eastern end of this unit, at the northern edge of Vacaville. Also, located near the unit's eastern end, I-505 is the most heavily travelled county scenic roadway within the project viewshed. As described below, the minor incremental visual effects associated with project changes, including tower raises, will not have a noticeable effect on public views and will not substantially affect visual character or quality in the area.

Figures 5a and 5b show a relatively close range view from southbound I-505, a designated Solano County scenic roadway. The photograph represents the brief duration for a motorist's view of the project. Project lattice towers are visible at relatively close range location and lattice towers supporting another overhead line parallel the existing project alignment on the left; a wood pole that supports another utility line is to the right. Grass-covered hillsides and the more distant Vaca Mountains are clearly visibly in the backdrop. Typical roadside vegetation, including tall shrubs and trees, partially screen views toward the alignment.

The Figure 5b simulation shows the new cage-top extension on the lattice tower on the right, located approximately 950 feet away. A more subtle change is created by the smaller diameter, light gray replacement insulators. Although the modified tower appears to be slightly taller, its overall appearance essentially is unchanged. A comparison of the existing view and simulation illustrates that the project-related changes do not noticeably alter the composition or character of the landscape that is seen from this well-traveled county scenic roadway or from nearby areas.

Table 2: Summary of Simulation Views

Viewpoint Location and VP Number (Figure Number)	Visible Proposed Project Change	Approximate Distance to Nearest Visible Project Element
Eastern Landscape Unit		
I-505 southbound – VP 2 (Figure 5)	Installation of a 16.5-foot cage-top extension on one lattice tower. Replacement of insulators.	950 feet
Pleasants Valley Road near Vaca Valley Road – VP 5 (Figure 6)	Installation of 16.5-foot cage-top extensions on two lattice towers. Addition of shield wire peak to one tower. Replacement of insulators. Installation of outriggers on two arms of one tower.	1,300 feet
Central Landscape Unit		
Suisun Valley Road – VP 9 (Figure 7)	Installation of a 15-foot cage-top extension on one lattice tower. Replacement of insulators.	1,200 feet
Western Landscape Unit		
SR-221 near Tulucay Substation – VP 14 (Figure 8)	Installation of 16.5-foot cage-top extensions on two lattice towers. Replacement of insulators. Replacement of one 70-foot-tall light-duty steel pole tower with a 70-foot-tall tubular steel pole on substation site. (Not visible in simulation.)	1,500 feet
Vista Point near SR-12/SR-29 – VP 15 (Figure 9)	No height increase on towers. Conversion of one tower to dead end (second set of insulators added.) Removal of lower set of outrigger arm extensions on one tower. Replacement of insulators and marker balls.	2,700 feet
SR-12 near Haire Lane – VP 20 (Figure 10)	Installation of a 16.5-foot cage-top extension on one lattice tower. Replacement of insulators.	1,100 feet
SR-116 near East Bonness Road – VP 22 (Figure 11)	Installation of a 15-foot cage-top extension on one lattice tower. Replacement of insulators. Removal of lower set of outriggers on tower.	1,300 feet
Old Adobe Road at Petaluma Adobe State Historical Park – VP26 (Figure 12)	Installation of a 16.5-foot cage-top extension on one lattice tower. Removal of lower set of outrigger arm extensions on one tower. Replacement of lattice H-frame with tubular steel H-frame in substation.	1,000 feet

Note: Refer to Figure 3 for simulation viewpoint locations.

Source: Data compiled by AECOM in 2013

Figures 6a and 6b present a photograph taken from Pleasants Valley Road, a Solano County scenic roadway that represents a motorist's view and approximates the view of rural residents at the northern edge of Vacaville. Views toward the existing project alignment from this location are relatively unobstructed, although roadside vegetation provides some screening. Pairs of lattice towers and overhead line along the alignment and an adjacent line on the right are visible where they traverse open fields and vineyards in the foreground and across the rolling, savanna-covered English Hills in the background. One existing structure on the hillside is silhouetted against the sky, and the upper portion of the nearest tower also appears against the sky.

The Figure 6b simulation shows three modified towers, including the two closest structures with cage-top extensions. These structures are located 1,300 and 2,100 feet away, respectively. More subtle changes involve the additional outrigger arm extensions, to the nearest tower, and the addition of a shield-wire peak to the third nearest tower, which is converted to dead-end structure (i.e., a second set of insulators has been added). In addition, smaller diameter, lighter colored replacement insulators are less noticeable on the towers. The visual simulation illustrates that the changes will be minor and not particularly noticeable and the reconductoring project will not substantially alter views in this area.

Based on information outlined above, the reconductoring project will not substantially affect views of the landscape setting within the Eastern Landscape unit and any aesthetic impact will be less than significant.

Central Landscape Unit

One viewpoint was chosen to illustrate project-related visual changes within this sparsely populated landscape unit. As described in Section 2.2 Landscape Units and Representative Views, much of this approximately 15-mile-long landscape unit is rugged mountain terrain and has a limited number of viewers. Within this landscape unit, the reconductoring project will raise 20 of the existing 72 existing towers along the existing project alignment. Three of the 20 project towers with cage-top extensions in this unit will not be visible from residences or county scenic roadways, while two others will be visible only from one or two residences. In addition, although the existing alignment crosses a loop segment of the San Francisco Bay Area Ridge Trail, the closest existing tower with a new cage top extension lies approximately 0.5 mile away, and the changes will not affect views from along the trail.

The few residences in this unit are concentrated in the hillside community of Green Valley, with scattered rural residences in Suisun Valley. As documented in Section 2.2, Landscape Units and Representative Views, mature vegetation and topography provide considerable screening with respect to views toward the existing project alignment. When visible to the public, the project will usually be seen against a wooded hillside backdrop, where lattice towers will tend to blend in with the landscape. As described below, in cases where the reconductoring project will be seen along the skyline, the minor incremental visual changes generally will not be noticeable.

Figures 7a and 7b show a view from Suisun Valley Road, which is a Solano County scenic roadway that conveys a sense of the typical landscape character in this unit as seen by motorists and by residents in the rural Suisun Valley area. Vineyards line both sides of the road and distant mountains, including the Twin Sisters Peaks that are visible in the backdrop. Foreground landscape elements include wood utility poles, overhead transmission lines, and road signs. Upper portions of the existing project alignment and an adjacent line can be seen beyond dense tree cover, where

lattice towers and overhead conductors are visible against a combination of wooded hillside and sky. Beyond the vineyards, hillside trees partially screen lower portions of towers. The existing project towers are on the right in each pair of towers.

The Figure 7b simulation shows a 16.5-foot-tall cage-top extension on the tower, seen at the right side of the view. The visual change is subtle, and the taller modified tower on the right is slightly more noticeable where it appears against the sky. Replacement insulators are lighter in color, although at this distance, the difference is nearly imperceptible. A comparison of the simulation with the existing view shows that the reconductoring project will not affect the landscape setting along this rural county scenic roadway or within the Suisun Valley area. As noted previously, to the extent the existing project alignment is visible to the public in this landscape unit; it generally blends into the wooded landscape backdrop.

Given the above information, the reconductoring project will not substantially affect views of the landscape setting within the Central Landscape unit and any aesthetic impact will be less than significant.

Western Landscape Unit

The approximately 17.5-mile-long Western Landscape Unit is the longest of the three units, and it mainly has the rolling hills that are typical of the Sonoma and Napa Valley wine-growing region. The existing project alignment crosses and parallels a network of county scenic roadways and passes near rural residences at the edges of Sonoma, Napa, and Petaluma. In the Western Landscape Unit, the reconductoring project will include tower raises on 10 of the existing 82 towers. Visual simulations show project-related visual changes from five key observation points located within this unit.

The 10 project towers with new cage-top extensions are visible from county scenic roadways or residences, and one of the modified towers is located within 100 feet of a residence. However, two of the modified towers are not visible from any of the county scenic roadways and are visible only from one or two residences. As described below, because of the minor and not particularly noticeable visual changes, the reconductoring project will not substantially affect the character of views within this landscape unit.

Figures 8a and 8b show a typical motorist's view on SR-221 looking toward Tulucay Substation on the left and the project alignment. As seen from this State Eligible Scenic Highway and City of Napa scenic corridor, a pair of project lattice transposition towers is located near the center of this view, and the top portion of a project lattice tower can be seen on the far right, beyond the vineyard. Overhead conductors and structures of another utility line also are seen adjacent to the substation. Mature trees at the western edge of the substation and vineyards in the foreground partially screen views of structures. In the background, vineyard-covered hillsides and the more distant forested mountains are visible.

The simulation depicted in Figure 8b shows a 16.5-foot-tall cage-top extension on the lattice transmission tower, on the left near the center of the view, and another 16.5-foot-tall cage-top extension that is barely noticeable on the far right against the vineyard backdrop. The overall form of the two modified towers is similar to that of the existing and remaining towers. In addition, on the left side behind the trees, a TSP replaces an existing light-duty steel pole at the substation; however, the change will not be noticeable because the new pole will be screened almost completely

by trees and will be the same height and in the same location as the structure it replaces. Visible changes will be minor and will not substantially affect the character of views from this scenic roadway.

Figures 9a and 9b show a view from the Grape Crusher Vista Point located along SR-12/SR-29, which is a Napa County scenic roadway that provides access to the Napa Valley wine region. This photograph presents a vista point view across the Napa River Valley and surrounding mountain ranges, as well as approximates an SR 12/SR-29 motorist's view.

The Figure 9b simulation shows minor project changes, including conversion of the second tower from the left to a dead-end structure, which will involve the addition of a second set of insulators. The outrigger extension on the lower arm of the far left tower also is removed. The replacement marker balls installed on overhead conductors spanning the Napa River are the same size, but they are slightly brighter in color, and the replacement insulators have a smaller diameter and are a lighter color. None of the existing towers seen from this location will be raised. The visual simulation shows that, taken together, project changes will be minor and nearly imperceptible. Therefore, the reconductoring project will not affect the existing landscape character seen from this scenic vista and the nearby scenic roadway.

Figures 10a and 10b show a typical view from SR-12 at Haire Lane, a residential cul-de-sac located in rural Sonoma County at the southern toe of the Sonoma Mountains, with rolling, grass-covered hillsides and vineyards. SR-12 is a scenic roadway in Napa and Sonoma counties, used by tourists as well as by local residents. The existing project alignment lies approximately 1,100 feet from the roadway and, from this view, an existing project lattice tower is prominent. Views toward the alignment from this portion of SR-12 are intermittent and screened by the undulating topography and trees.

Figure 10b shows a 16.5-foot-tall cage-top extension and, although taller, the tower's form and appearance are basically unchanged. Smaller diameter, light gray replacement insulators and new conductor replace the existing elements. When compared with the existing view, the visual simulation indicates that these minor incremental changes will not affect views of the landscape from this scenic roadway or locations in the vicinity. Additionally, potential visual effects in the general area will be minimal because the nearest towers with cage top extensions will be 1 mile to the west and 3 miles to the east.

Figures 11a and 11b show a view from SR-116, a Sonoma County scenic roadway near East Bonness Road in the southern part of Sonoma Valley, near the unincorporated community of Temelec. Taken where the open landscape affords views toward the existing project alignment, this photograph represents a motorist's view as well as that of nearby residents. On the right side of the road, a single project lattice tower is visible near the center of the view, with conductors crossing overhead. Wood poles and overhead lines can be seen along both sides of the roadway, and vineyards are in the foreground along the left side of the road. The distant, forested Sonoma Mountains rise in the backdrop.

The Figure 12b simulation shows a 15-foot-tall cage-top extension; however, the appearance of the tower overall remains unchanged. The replacement insulators are smaller diameter, lighter color and slightly less visible against the sky. The simulation also shows the removal of the lower set of outriggers on the right side of the tower. A comparison of the existing view and visual simulation

demonstrates that the reconductoring project will not noticeably affect views from this Sonoma County scenic roadway or from residences in the vicinity.

Figures 12a and 12b are a view from Old Adobe Road, a Napa County scenic roadway, at the entry to Petaluma Adobe State Historical Park and west of the intersection with Frates Road. This is a view seen by motorists and park visitors. This viewpoint is near Adobe Creek Golf Course and Country Club. A portion of Lakeville Substation is visible on the right side, and at the center, an existing project lattice tower and TSP also can be seen on the right side of the road, near the intersection of Frates Road. Farther away and directly in line with the roadway, another existing project tower also is visible, approximately 0.5 mile away. On the right, lattice transmission towers that support two other lines appear, with overhead conductors crossing the roadway. Wood utility poles also are shown on either side of the road, with conductors alongside and crossing the road. Grass-covered hills and the southern Sonoma Mountains are seen in the backdrop. Roadside vegetation partially screens the utility structures that are prominent elements within the landscape.

The Figure 12b simulation shows project changes, including a 16.5-foot-tall cage-top extension on the lattice tower, in the center. On the far right, the simulation also shows a new tubular steel H-frame replacement structure within Lakeville Substation that is similar in size and height to the existing structure; however, its form is somewhat simpler. The take-off structure is partially screened by existing vegetation and transmission structures, and this change is not particularly noticeable. Replacement insulators are smaller diameter and a lighter color. Taken together, these minor incremental visual effects will not be particularly noticeable because of the presence of numerous existing utility structures. A comparison of Figures 12a and 12b demonstrates that the reconductoring project will not substantially affect views from this scenic roadway or from nearby areas.

Based on information outlined above, the reconductoring project will not substantially affect views of the landscape setting within the Western Landscape unit and any aesthetic impact will not be minor and not particularly noticeable.

3.3 Potential Visual and Aesthetic Impacts

The project proposes minor changes to an existing transmission route. The height of the 39 towers that require cage-top extensions will increase by up to 16.5 feet; however, the general appearance of these structures will be unchanged. Electric utility structures, including existing substations, lattice towers, steel and wood poles, and overhead lines, currently are visible along the project alignment. The reconductoring project will not obstruct views of the surrounding hillsides, ridgelines, or mountains. Overall, the visual changes will be minor and not particularly noticeable to the public.

As seen from the Grape Crusher Sculpture, the only recognized scenic vista in the area, project-related change will not be evident to the casual observer (refer to Figure 9). The project route crosses several Eligible State Scenic Highways and various Solano, Napa, and Sonoma county scenic routes; however, as demonstrated in the set of before and after simulation figures, the proposed changes will not have a noticeable effect on views from these roadways (Figures 5a through 12 b). The project alignment is not visible from a Designated State Scenic Highway.

The reconductoring project will not degrade existing visual character in the area. Project construction will not require substantial tree removal or grading; however, removal or trimming of approximately five mature eucalyptus trees located at the western edge of Tulucay Substation is

likely to be required for project construction. These trees partially screen some of the substation structures from limited areas along three nearby public roads, including SR-221 (a Napa County scenic route), Anderson Road (a narrow paved rural road), and Bordeaux Way (a rural road located west of SR-221 that provides access to two wine region resort hotels). Tree removal may result in the substation becoming more visible from a limited area; however, transmission structures are characteristic landscape features seen within a visual setting. Specifically, roadway views in the project area typically include infrastructure-related foreground elements, such as wood utility poles, lattice towers, overhead lines, and road signs. As a result, the changes will have an incremental visual effect that will not substantially affect the landscape setting. Additionally, trees will be pruned in a manner that minimizes loss of visual screening of the substation. Should existing trees require removal, trees will be replaced with trees that are a lower-growing, drought tolerant species and native to California. Similar plantings may also be installed to supplement and fill in the gaps within the existing hedgerow located on the western side of the substation to provide additional screening. Therefore the visual changes will be minor.

The project does not involve installation of new lighting. Potential day or nighttime glare effects will be less than significant because the new cage-top extensions are composed of dull, non-reflective steel that does not create glare and because potential glare from overhead conductors will be similar to what currently exists within the proposed area under baseline conditions.

3.4 Conclusions

The project involves minor incremental changes within an existing transmission route located in a landscape setting that includes various existing transmission lines and vertical structures. As described previously and demonstrated by the set of visual simulations, the changes will not be particularly noticeable to the public. The minor incremental visual effects will be further reduced through implementation of APMs. Therefore visual impacts will be less than significant.

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APPENDIX A: PUBLIC POLICY AND REGULATORY FRAMEWORK

This appendix includes applicable plans, policies, and regulations, which pertain to visual quality for the project area. Because the project involves minor modifications to an existing transmission line that will not be noticeable to the public, it is consistent with the policies described below.

Federal

No federal regulations related to aesthetic resources pertain to the project.

State

California Scenic Highway Program

California's Scenic Highways Program, described in the Streets and Highways Code, was established by the Legislature in 1963 to preserve and enhance California's natural beauty. The State Scenic Highway System includes highways that either are eligible for designation as scenic highways or have been designated as such. The status of a state scenic highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives the designation from Caltrans (Caltrans 2009). A city or county may propose adding routes with outstanding scenic elements to the list of eligible highways. However, state legislation is required before a highway can be officially designated.

There no Designated Scenic Highways within the project viewshed. SR 29, SR 37, SR 121, and SR 221, are Eligible Scenic Highways in the project area.

Local

Because the California Public Utilities Commission has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local discretionary land use regulations. However, local plans and policies have been considered as part of its environmental review process.

The project alignment is located in unincorporated areas of Solano, Napa, and Sonoma counties and passes through the cities of Vacaville and Napa. This section reviews visual resource-related policies and regulations for these counties and cities. The following table is a summary of the roadways designated by these jurisdictions as scenic. As noted previously, the project will not have a noticeable effect on views from these roadways.

Summary of Designated Scenic Routes in the Project Area

Scenic Route (Location Relative to Project Alignment)	Designation	Photographs[1]
I-505	Solano County Scenic Roadway	1 and 2
Pleasants Valley Road	Solano County Scenic Roadway	7
Jameson Canyon Road (1.75 miles away)	Solano County Scenic Roadway	NA
Suisun Valley Road	Solano County Scenic Roadway	9–11
SR 37 (6.5 miles away)	State Eligible Scenic Highway Solano County Scenic Roadway	Project not visible
SR 221	State Eligible Scenic Highway City Of Napa Scenic Corridor	14
SR 12	Napa County Scenic Roadway	15, 17, and 20
SR 29	State Eligible Scenic Highway Napa County Scenic Roadway City of Napa Scenic Corridor	15
SR 121	State Eligible Scenic Highway Sonoma County Scenic Corridor Napa County Scenic Roadway City of Napa Scenic Corridor	17 and 20
SR 12/Broadway Street	Sonoma County Scenic Corridor	21
SR 116	Sonoma County Scenic Corridor	22, 23, and 24
Old Adobe Road near Petaluma	Sonoma County Scenic Corridor	25 and 26

Notes:

1 Photographs are shown in Figure 4.

I-505 = Interstate 505; NA = not applicable; SR = State Route

Source: Data compiled by Environmental Vision in 2012

Solano County General Plan

The Solano County General Plan (Solano County 2008) includes goals, policies, and implementation measures to guide development and protect visual quality in the county on a long-term basis. Scenic resources are addressed in the Land Use, Resources, and Public Facilities chapters. The Land Use Chapter contains general provisions regarding the preservation of sensitive resources, namely agricultural lands, creeks, native trees, open spaces, and views; however, it does not contain specific provisions that apply to the project.

The Scenic Resources section of the general plan's Resources chapter contains provisions for preserving scenic geographic features of Solano County, including hills and ridgelines; reducing light pollution and glare; and protecting the visual character of designated county scenic roadways. Among those provisions is a requirement that fixtures in new developments direct light toward target areas, shield it from escaping, and reduce glare and light pollution. The Scenic Resources section also directs that the visual character of scenic roadways be protected. The project alignment crosses three Solano County scenic roadways—Interstate 505 near Vacaville, Suisun Valley Road, and Pleasants Valley Road.

The Public Facilities Chapter of the Solano County General Plan sets forth policies regarding the placement of utility cables through agricultural lands. The following Public Facilities policies are relevant to the project:

> **Policy PF.P-49.** Use parallel or existing ROWs [rights-of-way] for gas, electric, and telephone utility alignments in a manner that avoids heavily developed areas.
>
> **Policy PF.P-50.** Locate, design, and construct transmission lines in a manner that minimizes disruption of natural vegetation, agricultural activities, scenic areas, and avoids unnecessary scarring of hill areas.

Napa County General Plan

The existing project alignment passes through unincorporated portions of southern Napa County. The Community Character Element of the Napa County General Plan (Napa County 2008) addresses scenic roadways and light and glare in the county. Figure CC-3 of the Community Character Element shows the location of county scenic roadways.

The existing project alignment crosses or passes near two Napa County scenic roadways—State Route (SR) 29/SR 12 south of Napa, which crosses the alignment, and SR 12/SR 121/Old Sonoma Road, which passes within 800 feet of the alignment.

Sonoma County General Plan 2020

The Land Use Element and Open Space and Resource Conservation Element of the Sonoma County General Plan 2020 (Sonoma County 2008) contain various references to visual resources and the scenic qualities of the county. In particular, the plan calls for the preservation of the visual and scenic qualities of scenic corridors.

Goal LU-10. The uses and intensities of any land development shall be consistent with preservation of important biotic resource areas and scenic features.

Figure OSCR-1, Scenic Resource Areas, in the Open Space and Resource Conservation Element (Sonoma County 2008) indicates that the existing project alignment crosses the following Sonoma County scenic corridors:

- SR 121 (crosses and parallels for approximately 6 miles)
- Broadway, Sonoma (crosses)
- SR 116, Sonoma (crosses)
- Old Adobe Road, Petaluma (crosses; Lakeville Substation is located adjacent)

Figure OSCR-1 also indicates that the existing project alignment passes through Scenic Landscape Units around Sonoma and Petaluma.

The following goals, objectives, and policies in the Open Space and Resource Conservation Element of the Sonoma County General Plan apply to the visual resources in the project area.

Goal OSRC-2. Retain the largely open, scenic character of important Scenic Landscape Units.

Objective OSRC-2.1. Retain a rural, scenic character in Scenic Landscape Units with very low intensities of development. Avoid their inclusion within spheres of influence for public service providers.

Objective OSRC-2.2. Protect the ridges and crests of prominent hills in Scenic Landscape Units from the silhouetting of structures against the skyline.

Objective OSRC-2.3. Protect hills and ridges in Scenic Landscape Units from cuts and fills.

Policy OSRC-3h. Design public works projects to minimize tree damage and removal along Scenic Corridors. Where trees must be removed, design replanting programs so as to accommodate ultimate planned highway improvements. Require revegetation following grading and road cuts.

City of Napa General Plan

The existing project alignment passes through the southern edge of the city of Napa near the intersection of SR 12 and SR 221. The Land Use Element of the City of Napa General Plan (City of Napa 2011) contains the following policies regarding aesthetics and scenic corridors:

Policy LU-1.6. The City shall designate SR 29, SR 121, and SR 221 as scenic corridors. The City shall endeavor to improve the scenic character of these roads through undergrounding of utilities, increased landscaping, street tree planting, and other improvements.

Policy LU-1.7. The City shall enhance the Napa River as a natural corridor and recreational spine connecting neighborhoods, employment areas, and other destinations. *(See Chapter 5, Parks and Recreation).*

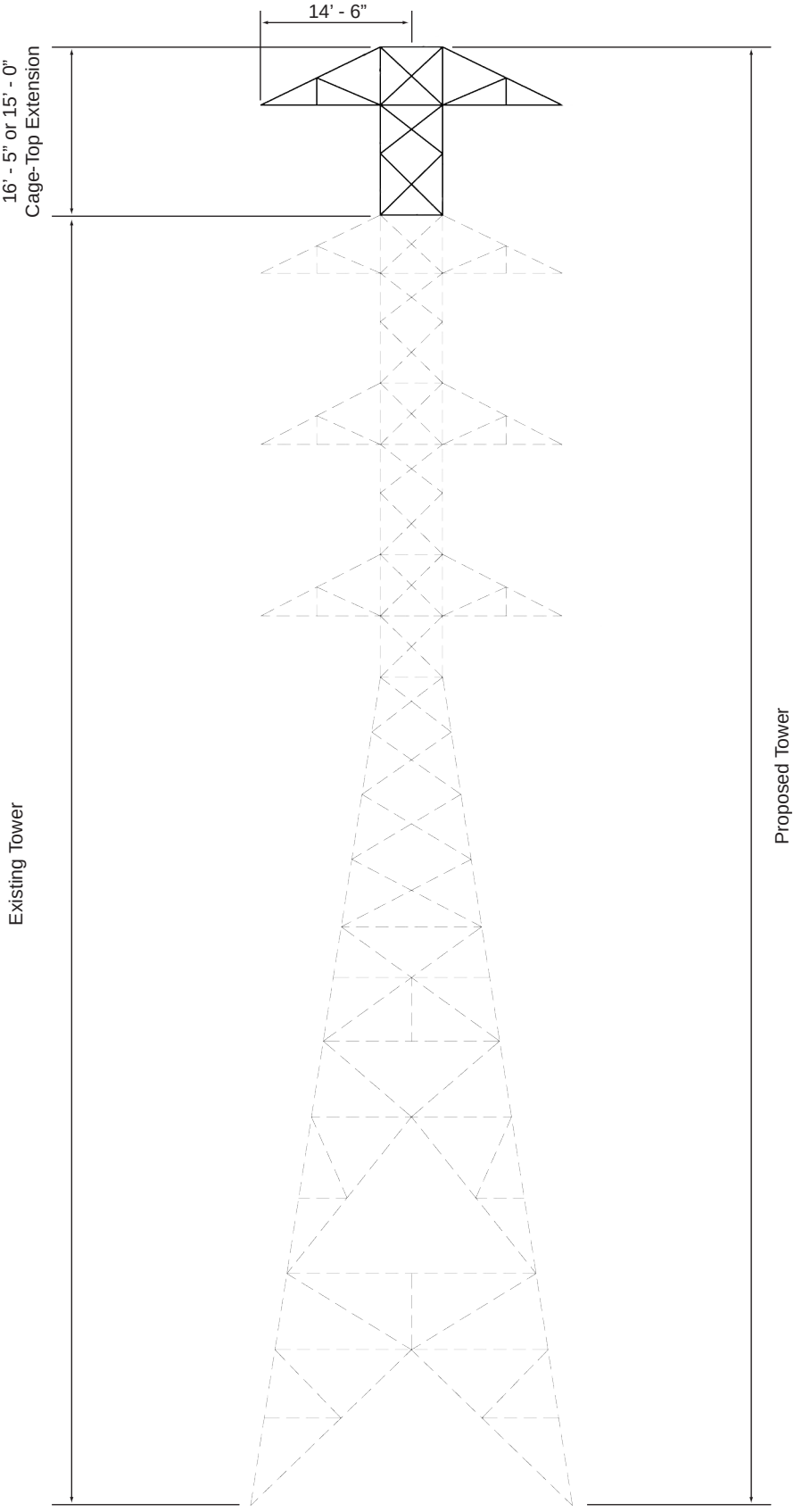
City of Vacaville

A portion of the existing project alignment lies within Vacaville, and portions including Vaca-Dixon Substation lie within the City of Vacaville's sphere of influence. No scenic roadways are designated in the city. Chapter 2, the Land Use Element, of the City of Vacaville General Plan contains the following policies regarding utility lines in Vacaville:

> **Policy 2.1-G 3.** Establish open space linkages by preserving habitat areas, including natural creek corridors. Use utility easements where possible as open space linkages.
>
> **Policy 2.1-G 9.** Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.
>
> **Policy 2.1-I 3.** Adopt and implement a plan to establish standards and design guidelines for the city's streets, entry ways and open spaces.

Chapter 5, the Public Facilities, Institutions, and Utilities Element, contains the following policy regarding utility lines in the Vacaville:

> **Policy 5.1-I 9.** Work with PG&E to develop transmission line corridors for attractive, community-serving, compatible uses.



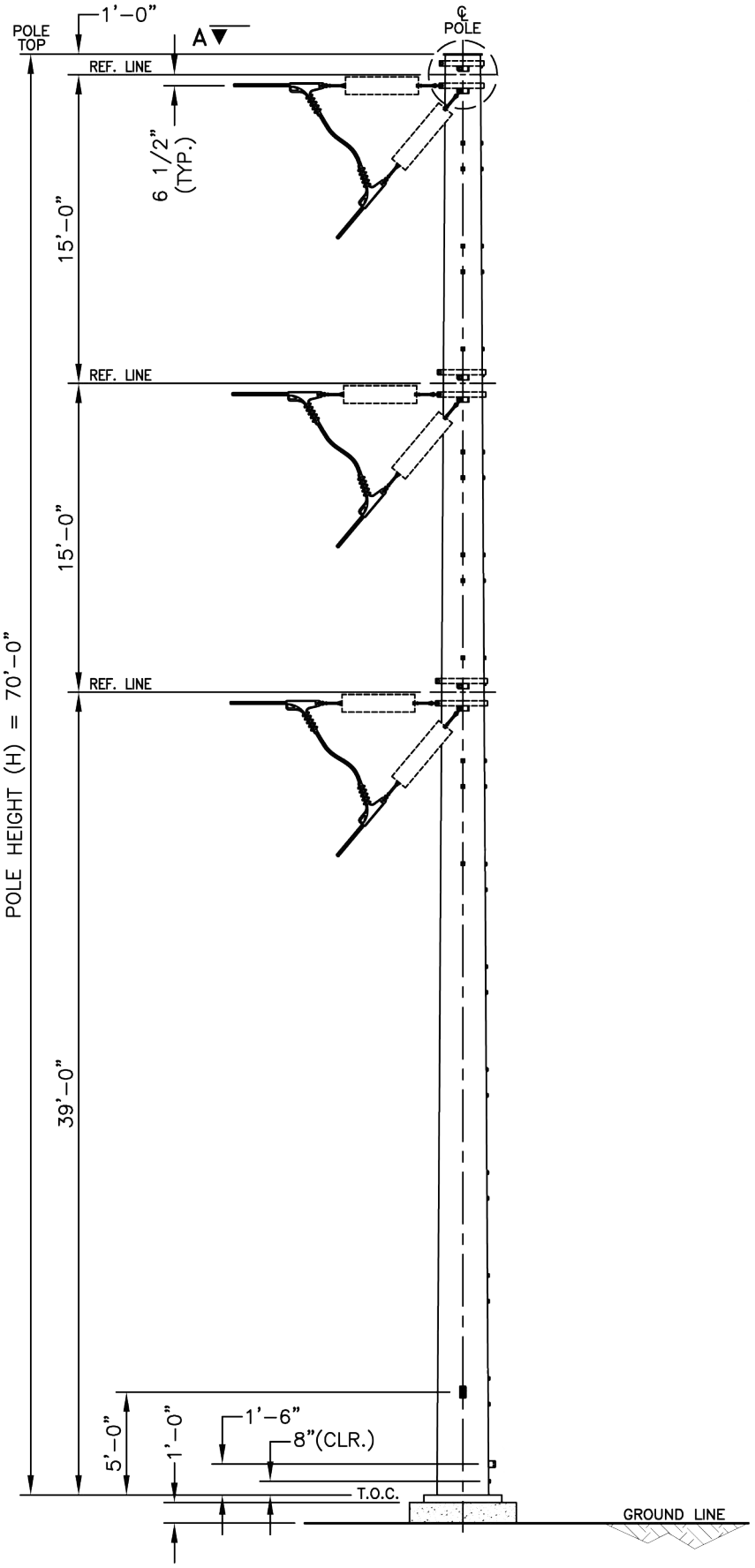
Preliminary and subject to change based on
California Public Utilities Commission requirements,
final engineering, and other factors.

Not to Scale

Source: PG&E 2008

ENVIRONMENTAL VISION
060413

Figure 1a
Elevation Drawing - Typical Steel Lattice Tower Modifications
Vaca Dixon-Lakeville 230 kV Reconductoring Project



Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

Not to Scale

Source: PG&E 2008

ENVIRONMENTAL VISION
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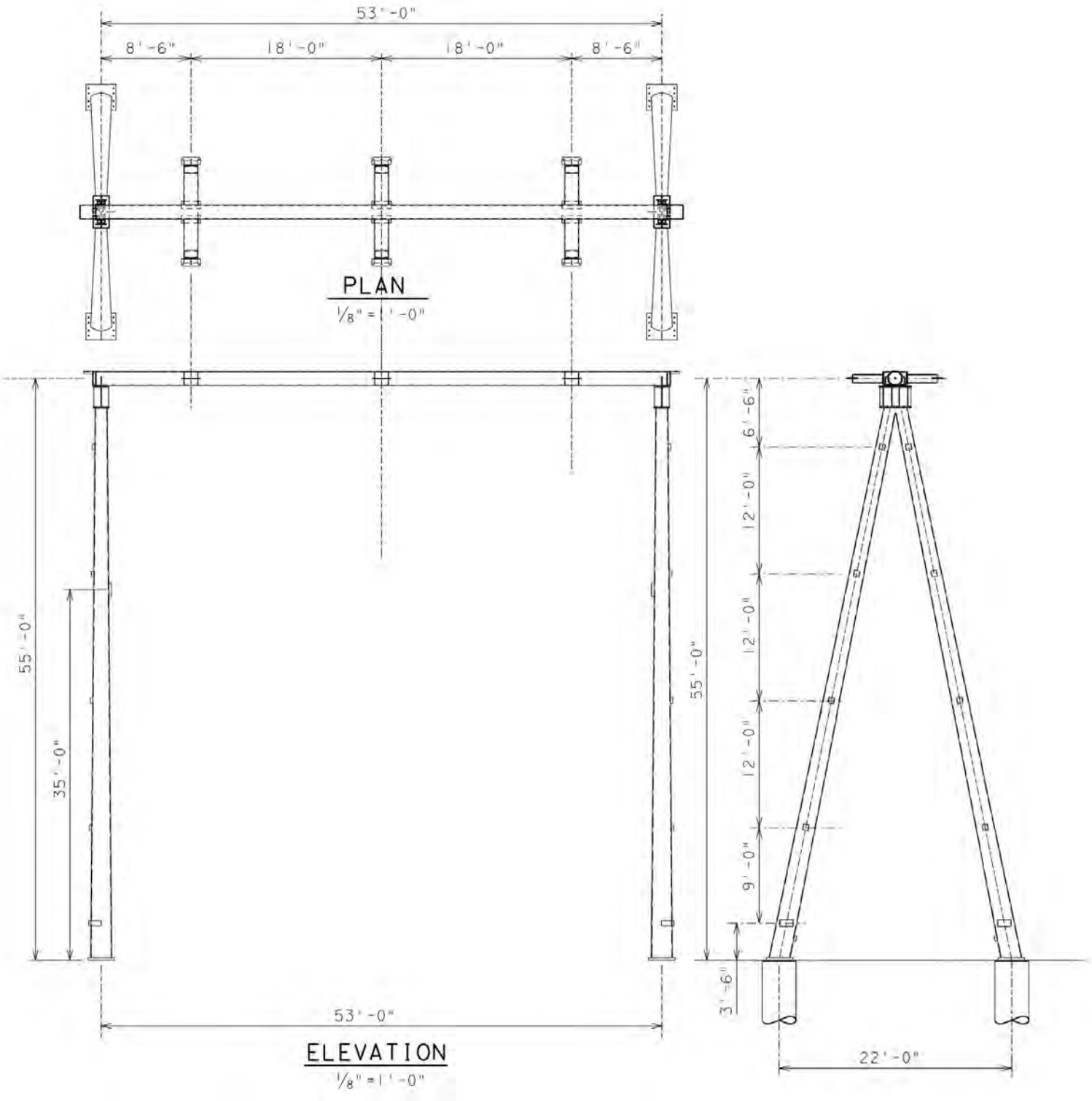
Figure 1b
Elevation Drawing - Typical Tubular Steel Pole
Vaca Dixon-Lakeville 230 kV Reconductoring Project



Preliminary and subject to change based on
California Public Utilities Commission requirements,
final engineering, and other factors.

Not to Scale

Source: PG&E 2008

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Figure 1c
Elevation and Plan Drawings - Typical Tubular Steel H-Frame Structure
Vaca Dixon-Lakeville 230 kV Reconductoring Project

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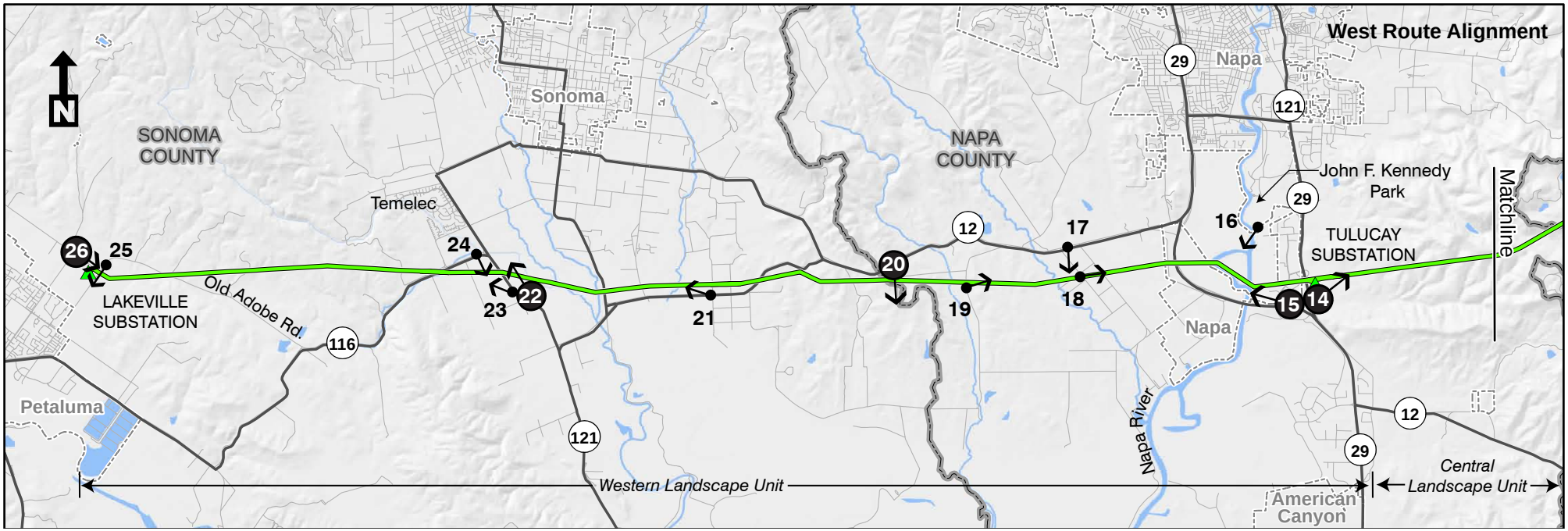
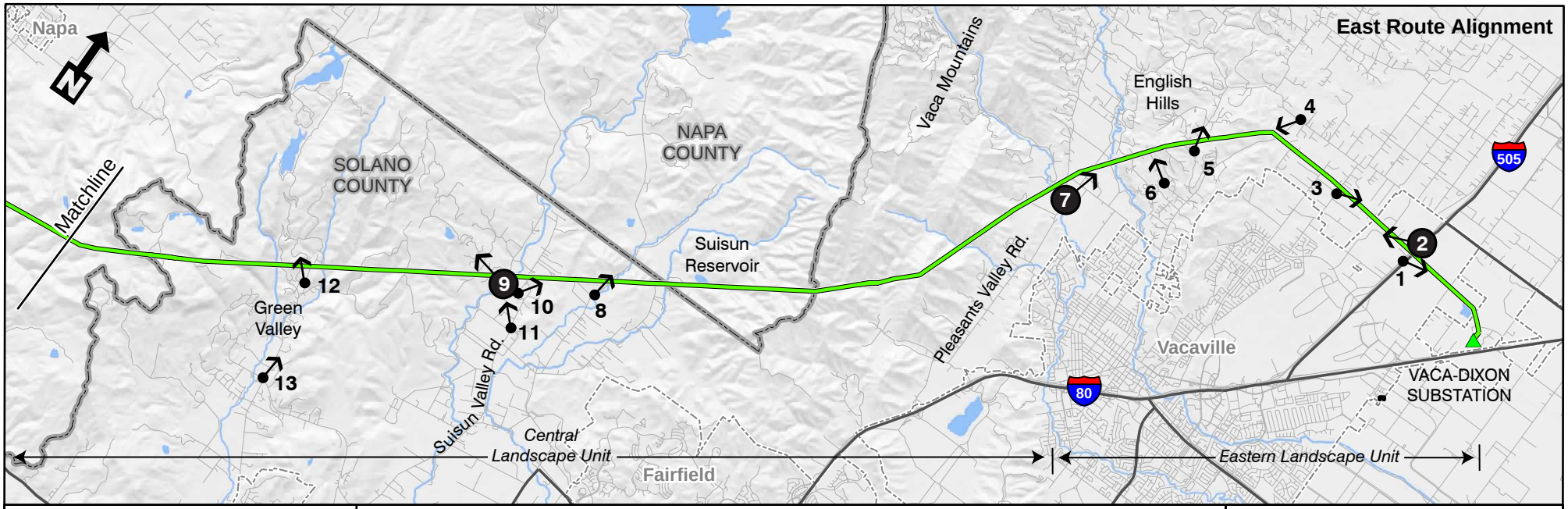
Figure 2
Regional Landscape Context, Landscape Units and Key Observation Points
Vaca Dixon-Lakeville 230 kV Reconductoring Project





Miles
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Pacific Gas and Electric Company

AECOM

DRAFT - Not For Public Review

Matchline
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Highway
Road
Water Feature
County Boundary
City Limit

1 → Photograph Viewpoint Location and Direction

2 → KOP Photograph Viewpoint Location and Direction

Source: Environmental Vision

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Figure 3: Photograph Viewpoint Locations

032813

1. I-505 northbound looking east (Eastern Landscape Unit)

2. I-505 southbound looking south (Eastern Landscape Unit) *

* Simulation Viewpoint 2; see Figure 5 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

Figure 4a
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

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3. Browns Valley Road near Beck Lane looking southeast (Eastern Landscape Unit)

4. Cantelow Road at Gibson Canyon Road looking southwest (Eastern Landscape Unit)

Refer to Figure 3 for viewpoint locations.

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Figure 4b
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

5. Steiger Hill Road looking north (Eastern Landscape Unit)

6. Serenity Hills Road near Forbes Drive looking north (Eastern Landscape Unit)

Refer to Figure 3 for viewpoint locations.

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Figure 4c
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

7. Pleasants Valley Road near Vaca Valley Road looking north (Eastern Landscape Unit) *

8. Gordon Valley Road looking north (Central Landscape Unit)

* Simulation Viewpoint 7; see Figure 6 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

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Figure 4d
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

9. Suisun Valley Road looking west (Central Landscape Unit) *

10. Suisun Valley Road looking northeast (Central Landscape Unit)

* Simulation Viewpoint 9; see Figure 7 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

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060413

Figure 4e
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

11. Suisun Valley Road near Julian Lane looking northwest (Central Landscape Unit)

12. Green Valley Lane looking northwest (Central Landscape Unit)

Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4f
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

13. Green Valley Road at Rockville Road looking northeast (Central Landscape Unit)

14. SR-221 looking northeast toward Tulucay Substation (Western Landscape Unit) *

* Simulation Viewpoint 14; see Figure 8 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4g
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

15. Vista point near SR-12/SR-29 at Napa River looking west (Western Landscape Unit) *

16. John F. Kennedy Memorial Park trail along Napa River looking southwest (Western Landscape Unit)

* Simulation Viewpoint 15; see Figure 9 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4h
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

17. SR-12 near Los Carneros Avenue looking south (Western Landscape Unit)

18. Los Carneros Avenue near Withers Road looking west (Western Landscape Unit)

Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4i
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

19. Duhig Road looking northeast (Western Landscape Unit)

20. SR-12 near Haire Lane looking south (Western Landscape Unit) *

* Simulation Viewpoint 20; see Figure 10 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4j
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

21. SR-12 (Fremont Drive) near Burndale Road looking northwest (Western Landscape Unit)

22. SR-116 looking northwest (Western Landscape Unit) *

* Simulation Viewpoint 22; see Figure 11 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4k
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

23. SR-116 near Mediera Road looking northwest (Western Landscape Unit)

24. SR-116 near Arnold Road looking southeast (Western Landscape Unit)

Refer to Figure 3 for viewpoint locations.

ENVIRONMENTAL VISION
060413

Figure 4l
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

25. Old Adobe Road near Frates Road looking towards Lakeville Substation (Western Landscape Unit)

26. Old Adobe Road at Petaluma Adobe State Historical Park looking towards Lakeville Substation (Western Landscape Unit) *

* Simulation Viewpoint 26; see Figure 12 for visual simulation of the project.
Refer to Figure 3 for viewpoint locations.

Figure 4m
Representative Photographs of Project Route and Vicinity
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
060413

Existing View from Interstate 505 southbound looking southeast (VP 2)

Refer to Figure 3 for viewpoint location.

Figure 5a
Existing View from Interstate 505
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
052213

Visual Simulation of Proposed Project (VP 2)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
052213

Figure 5b
Visual Simulation of Proposed Project from Interstate 505
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from Pleasants Valley Road near Vaca Valley Road looking north (VP 7)

Refer to Figure 3 for viewpoint location.

Figure 6a
Existing View from Pleasants Valley Road
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
052213

Visual Simulation of Proposed Project (VP 7)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
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Figure 6b
Visual Simulation of Proposed Project from Pleasants Valley Road
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from Suisun Valley Road looking west (VP 9)

Refer to Figure 3 for viewpoint location.

Figure 7a
Existing View from Suisun Valley Road
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
052213

Visual Simulation of Proposed Project (VP 9)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
052213

Figure 7b
Visual Simulation of Proposed Project from Suisun Valley Road
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from State Route 221 looking northeast toward Tulucay Substation (VP 14)

Refer to Figure 3 for viewpoint location.

Figure 8a
Existing View from State Route 221
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
052213

Visual Simulation of Proposed Project (VP 14)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
052213

Figure 8b
Visual Simulation of Proposed Project from State Route 221
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from Vista Point near State Route 12/29 at Napa River looking west (VP 15)

Refer to Figure 3 for viewpoint location.

Figure 9a
Existing View from Vista Point
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
052213

Visual Simulation of Proposed Project (VP 15)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
052213

Figure 9b
Visual Simulation of Proposed Project from Vista Point
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from State Route 12 near Haire Lane looking south (VP 20)

Refer to Figure 3 for viewpoint location.

Figure 10a
Existing View from State Route 12
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
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Visual Simulation of Proposed Project (VP 20)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
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Figure 10b
Visual Simulation of Proposed Project from State Route 12
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from State Route 116 looking northwest (VP 22)

Refer to Figure 3 for viewpoint location.

Figure 11a
Existing View from State Route 116
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ENVIRONMENTAL VISION
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Visual Simulation of Proposed Project (VP 22)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
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Figure 11b
Visual Simulation of Proposed Project from State Route 116
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Existing View from Old Adobe Road at Petaluma Adobe State Historical Park looking towards Lakeville Substation (VP 26)

Refer to Figure 3 for viewpoint location.

Figure 12a
Existing View from Old Adobe Road
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Visual Simulation of Proposed Project (VP 26)

Refer to Figure 3 for viewpoint location.
Preliminary and subject to change based on California Public Utilities Commission requirements, final engineering, and other factors.

ENVIRONMENTAL VISION
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Figure 12b
Visual Simulation of Proposed Project from Old Adobe Road
Vaca Dixon-Lakeville 230 kV Reconductoring Project

ATTACHMENT D:
AIR QUALITY AND GREENHOUSE GAS MODELING METHODOLOGY AND WORKSHEETS

Air Quality and Greenhouse Gas Modeling Methodology

Emissions associated with the reconductoring project were estimated using previously modeled emissions from a similar and recent PG&E reconductoring project, the Carrizo-Midway Reconductoring Project (CM), which was constructed in 2012–2013. CM included the same type of construction activities that will be required for the Vaca Dixon-Lakeville 230 kV Reconductoring Project (i.e., cage-top extensions, tower structure modifications, and reconductoring), and thus it provides a relevant and an authentic proxy for estimating construction emissions attributable to the project.

The CM construction emissions were modeled based on activities observed during CM construction. Therefore, the CM construction emissions used in this analysis are an accurate representation of actual construction activities and emissions associated with cage-top extensions, tower structure modifications, and reconductoring. The monitored construction activities were quantified using currently accepted models for air quality analysis. On-road mobile source emissions were quantified using the California Air Resource Board's on-road emissions inventory model, EMFAC2011.[1] For off-road construction equipment, a combination of the Sacramento Metropolitan Air Quality Management District's Construction Emissions Mitigation Calculator Version 6.1 and CalEEMod were used, based on the information that was available for each piece of construction equipment.[2,3] The helicopter emissions associated with cage-top extensions and tower structure modifications were quantified using the Federal Office of Civil Aviation's Guidance on the Determination of Helicopter Emissions.[4]

The CM construction activities and emissions were monitored and quantified for each month of construction. Each month of construction data included all on-road, off-road, and helicopter emissions generated during that month, along with the construction activities completed during the same period. For the Vaca Dixon-Lakeville 230 kV Reconductoring Project, the months from CM construction that would contain the most cage-top extensions, tower structure modifications, and reconductoring work were used to represent construction emissions for the Vaca Dixon-Lakeville 230 kV Reconductoring Project. The monthly emissions were used to develop emission factors in units of pounds of criteria air pollutants per unit completed (e.g., pounds of pollutant per cage-top extension, pounds of pollutant per tower structure modification, or pounds of pollutant per mile of reconductoring completed).

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[1] California Air Resources Board. 2012. *Mobile Source Emission Inventory—Current Methods and Data*. Available: http://www.arb.ca.gov/msei/modeling.htm. Accessed January 22, 2013.

[2] Sacramento Metropolitan Air Quality Management District. 2012. Mitigation (Construction Mitigation Calculator). Available: http://airquality.org/ceqa/mitigation.shtml. Accessed January 22, 2013.

[3] South Coast Air Quality Management District. 2011. California Emissions Estimator Model. Available: http://www.caleemod.com/. Accessed January 22, 2013.

[4] Federal Office of Civil Aviation. 2013. Guidance on Determination of Helicopter Emissions. Available: < http://www.bazl.admin.ch/experten/regulation/03312/03419/03532/index.html?lang=en>. Accessed October 2012.

CM construction emissions were not separated by each individual construction activity; therefore, when calculating the per construction activity emission factors (described previously), emission factors included emissions for other construction activities. For example, the CM construction activities also included optical ground wire work, which would not be required for the Vaca Dixon-Lakeville 230kV Reconductoring Project. Thus, the emission factors extracted from the CM construction modeling have additional construction activities embedded within the factors and are anticipated to provide a conservative estimate of construction emissions associated with the project. All construction activities for the Vaca Dixon-Lakeville 230kV Reconductoring Project were anticipated to occur in the same year, to provide a conservative estimate of annual construction emissions. Furthermore, to calculate average daily construction emissions for the Vaca Dixon-Lakeville 230kV Reconductoring Project, the minimum number of days of construction was used to provide conservative estimates of whether average daily emissions may exceed any significance thresholds.

The Vaca Dixon-Lakeville 230kV Reconductoring Project's construction activities will occur within the Bay Area Air Quality Management District's and the Yolo-Solano Air Quality Management District's jurisdictions. Therefore, construction activities (e.g., cage-top extensions, tower structure modifications, and reconductoring) that will occur within each air district were quantified separately and then were compared to the applicable thresholds of significance.

Carrizo-Midway to Vaca Dixon-Lakeville Construction Transfer
Emissions and Activities

January

Mod:Ext Ratio	5.00
Ext:Mod Ratio	0.20
CT Extension	1
Modification	5
OPGW	10

lbs

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO_2
Commute	1.22	15.99	0.11	0.11	7,332.23
Helicopter	75.37	145.42	4.16	4.12	28,264.62
Offroad	11.86	103.14	5.10	5.10	5,705.10
Onroad	1.33	15.88	0.52	0.48	908.38
Total	89.77	280.43	9.89	9.81	42,210.33
Average Daily	4.49	14.02	0.49	0.49	2,110.52
Avg Per Ext	89.77	280.43	9.89	9.81	42210.33
Avg Per Mod	17.95	56.09	1.98	1.96	8442.07

kg

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO_2
Commute	1.34	17.68	0.13	0.12	8,104.04
Helicopter	235.65	454.67	13.01	12.89	88,374.05
Offroad	10.75	91.59	4.85	4.85	5,119.03
Onroad	0.56	10.10	0.36	0.33	661.60
Total	248.29	574.03	18.34	18.18	102,258.72
Average Daily	12.41	28.70	0.92	0.91	5,112.94
Avg Per Ext	13.07	30.21	0.97	0.96	5382.04
Avg Per Mod	11.82	27.33	0.87	0.87	4869.46

Feburary

Mod:Ext Ratio	1.11
Ext:Mod Ratio	0.90
CT Extension	19
Modification	21
OPGW	12

June

Mod:Ext Ratio	1.38
Ext:Mod Ratio	0.73
CT Extension	8
Modification	11
OPGW	16
Reconductor	2.5

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO_2
Commute	1.47	19.36	0.14	0.13	8,875.86
Helicopter	304.23	587.00	16.79	16.64	114,094.85
Offroad	108.22	1026.67	49.12	47.63	76,151.52
Onroad	108.02	2132.65	74.96	68.97	117,282.79
Total	521.95	3765.68	141.01	133.36	316,405.02
Average Daily	26.10	188.28	7.05	6.67	15,820.25
Avg Per Ext	65.24	470.71	17.63	16.67	39550.63
Avg Per Mod	47.45	342.33	12.82	12.12	28764.09

Average

Mod:Ext Ratio	2.49
Ext:Mod Ratio	0.61
CT Extension	
Modification	

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO_2
Commute	4.03	53.03	0.38	0.35	24312.13
Helicopter	615.24	1187.09	33.96	33.65	230733.52
Offroad	130.83	1221.40	59.06	57.57	86975.65
Onroad	109.91	2158.62	75.84	69.78	118852.77
Total	860.01	4620.14	169.24	161.35	460,874.07
Average Daily	14.33	77.00	2.82	2.69	7681.23
Avg Per Ext	56.03	260.45	9.50	9.14	29047.66
Avg Per Mod	25.74	141.92	5.22	4.98	14025.21

Reconductoring (April-May)

Reconductor	7
Days	30

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO_2
Total	231.65	328.51	9.88	9.77	68,802.93
Average Daily	7.72	10.95	0.33	0.33	2,293.43
Average Daily Per Mile	1.103	1.564	0.047	0.047	327.633
Total Per Mile	33.09	46.93	1.41	1.40	9828.99

Vaca Dixon-Lakeville
Construction Parameters

Schedule

Work Days	260

Total Construction Activities

Cagetop Extensions	39	units
Tower Structure Modifications	77	units
Reconductoring	41.5	miles

	Mod:Ext	Ext:Mod
YSAQMD Jurisdiction	1.57	0.64

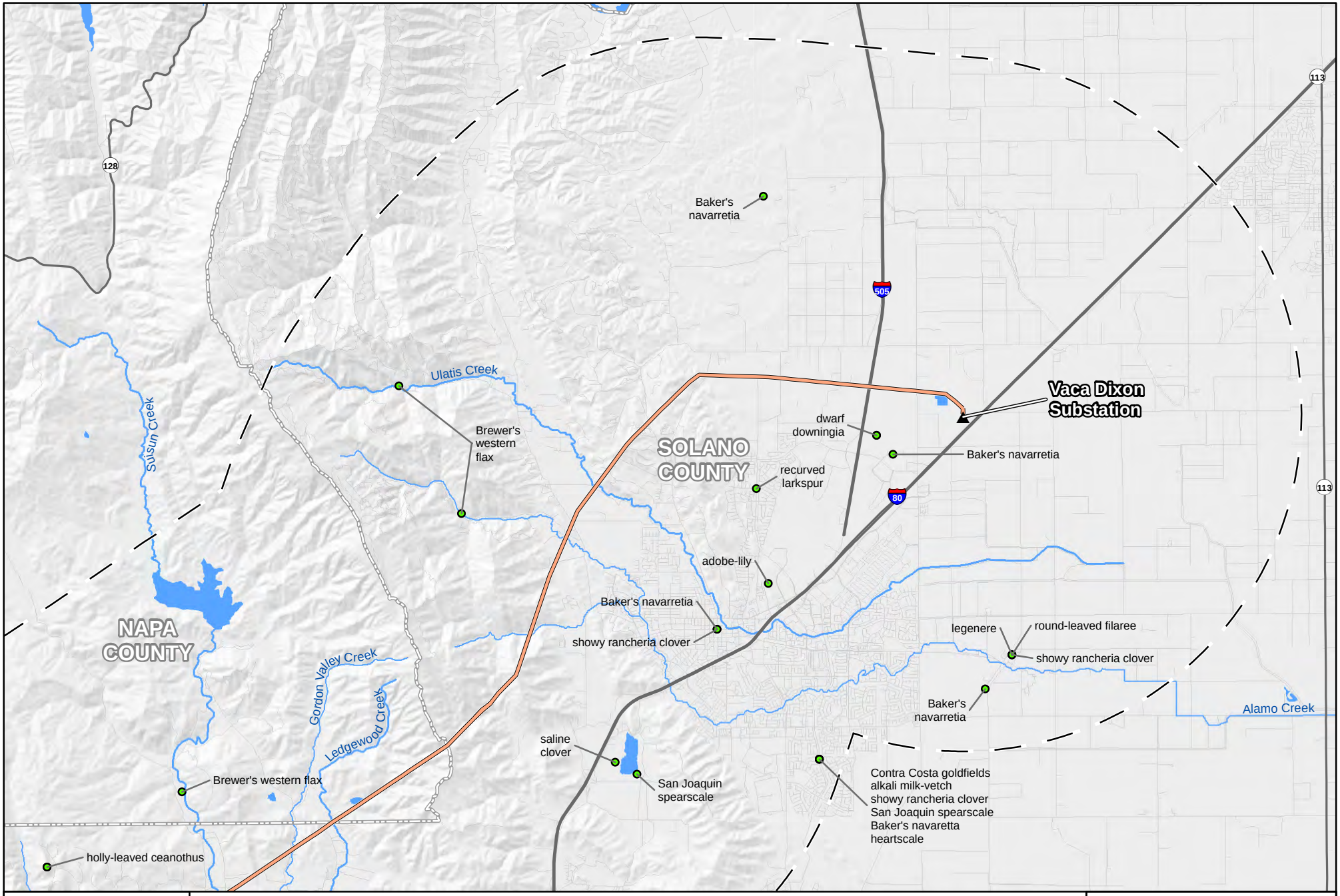
Cagetop Extensions	23	units
Tower Structure Modifications	36	units
Reconductoring	18.7	miles
Total Days	40	days

	Mod:Ext	Ext:Mod
BAAQMD Jurisdiction	2.56	0.39

Cagetop Extensions	16	units
Tower Structure Modifications	41	units
Reconductoring	22.8	miles
Total Days	120	days

Air District	**ROG**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
BAAQMD					
Total Emissions (tons/yr)	0.528	2.909	0.107	0.102	261
Average Daily (lbs/day)	8.80	48.49	1.78	1.70	
YSAQMD					
Total Emissions (tons/yr)	0.64	3.00	0.11	0.11	303

ATTACHMENT E:
CNDDB SPECIAL-STATUS PLANT SPECIES OCCURRENCES (CONFIDENTIAL)

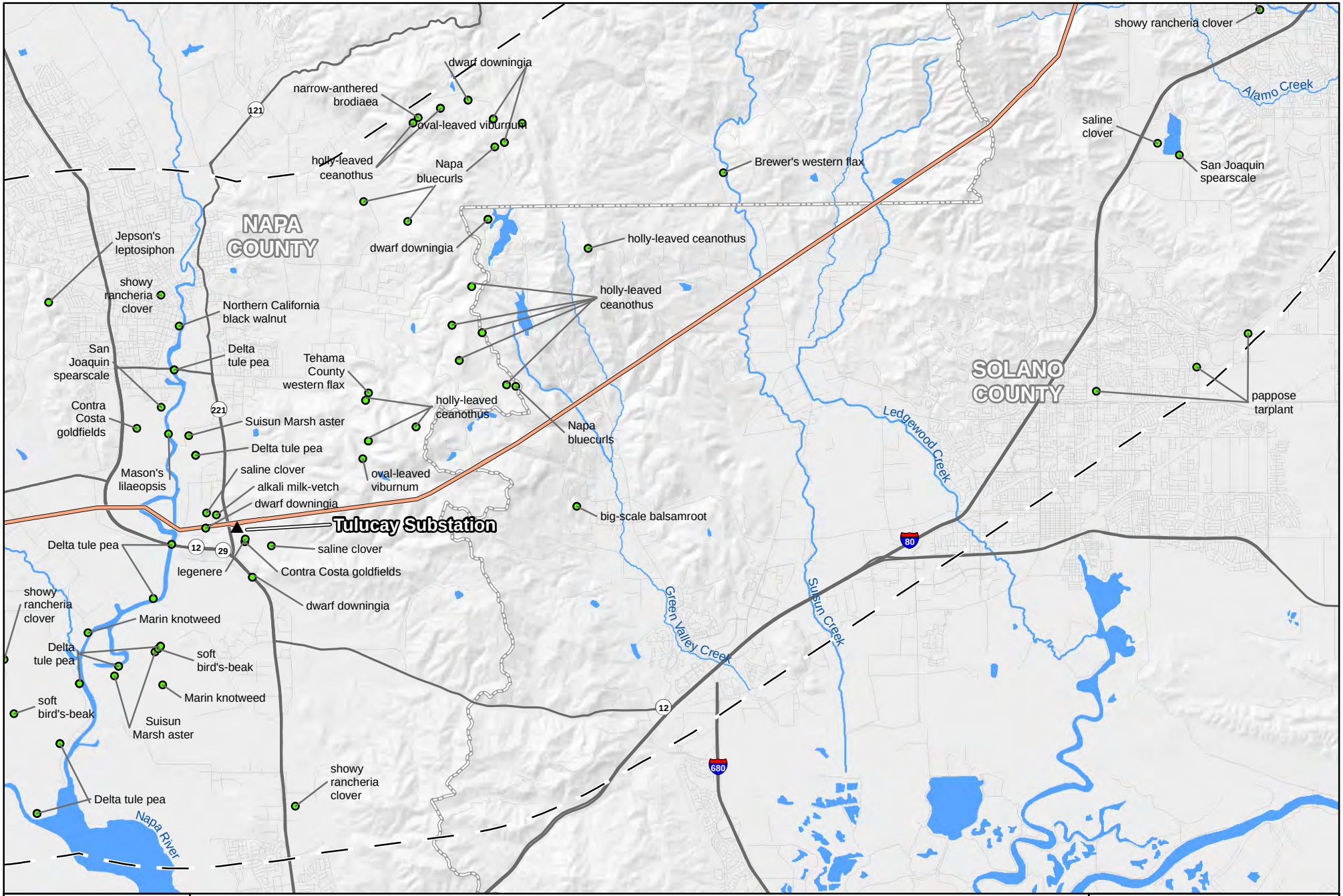


Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment E: Special-Status Plant Species Occurrences

Map (1 of 3)

September 2013



Miles
0 0.5 1

AECOM

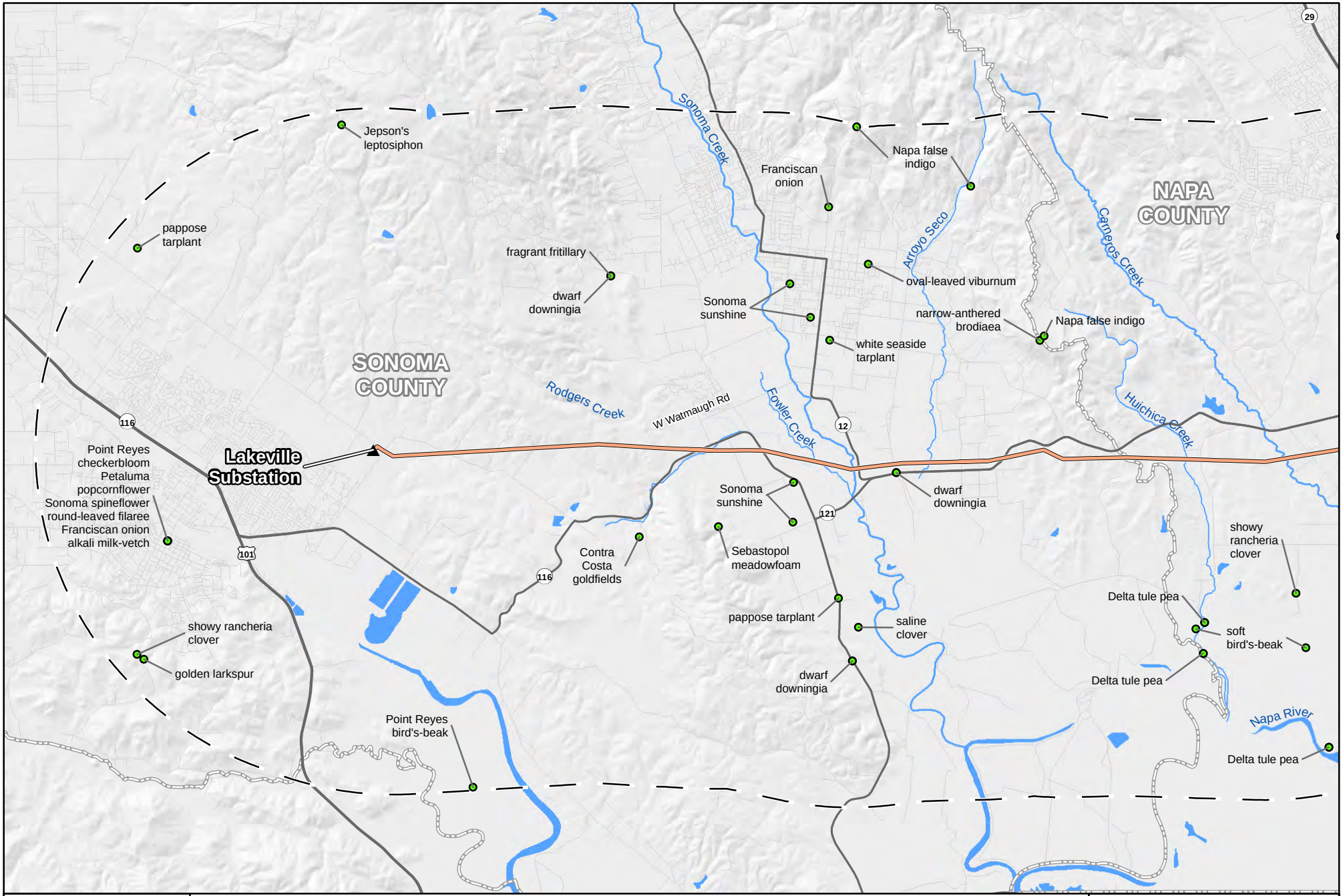
Pacific Gas and Electric Company

- Existing Substation
- Existing Vaca Dixon-Lakeville 230 kV Transmission Line
- Highway
- County Boundary
- Water Feature
- Plant Species
- 5-Mile Buffer

Source: PG&E 2013, CNDDB 2012

Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment E: Special-Status Plant Species Occurrences
Map (2 of 3)
September 2013



N

Miles
0 0.5 1

AECOM

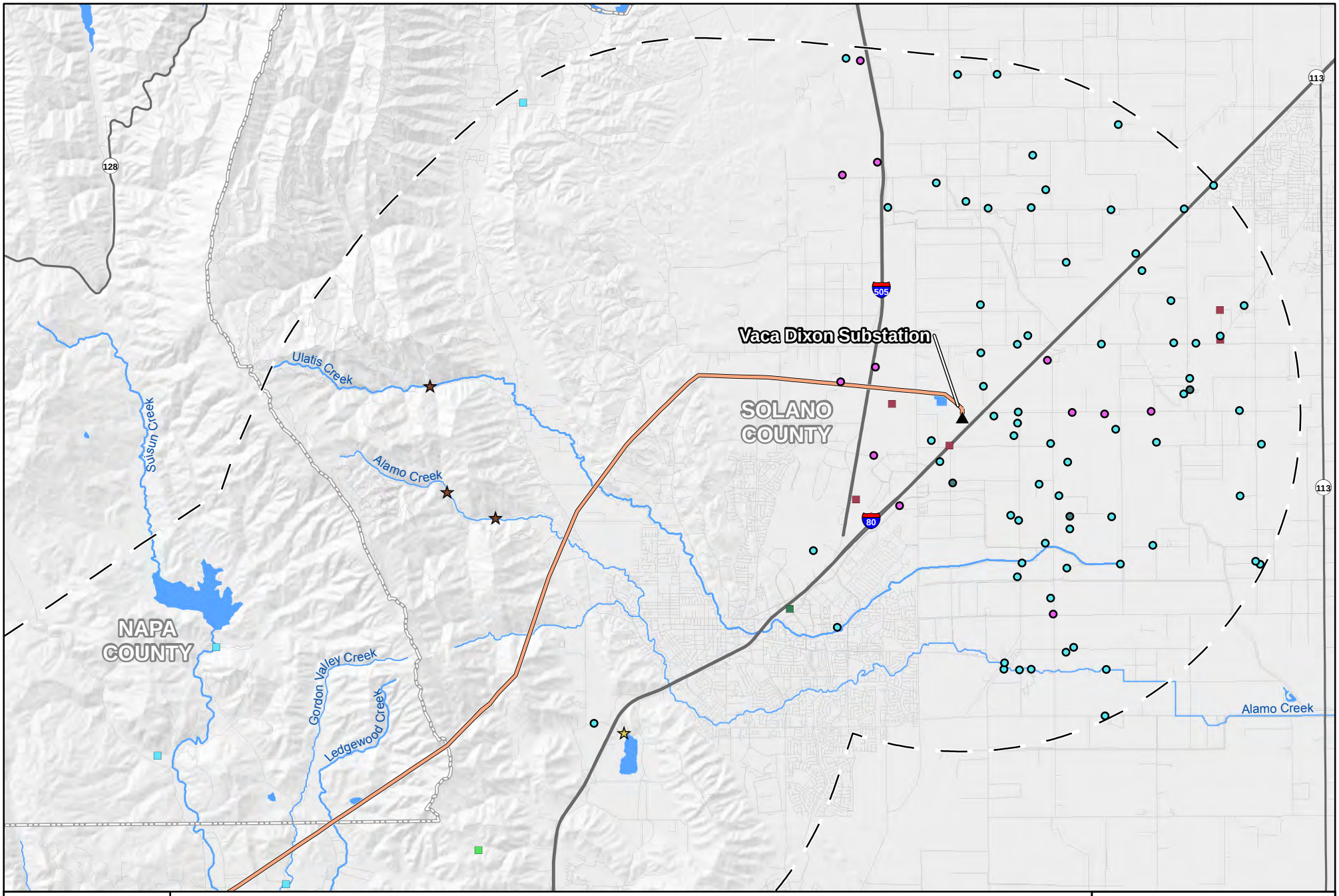
Pacific Gas and Electric Company

Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Highway
County Boundary
Water Feature
Plant Species
5-Mile Buffer

Source: PG&E 2013, CNDDB 2012

Vaca Dixon-Lakeville 230 kV Reconductoring Project
Attachment E: Special-Status Plant Species Occurrences
Map (3 of 3)
September 2013

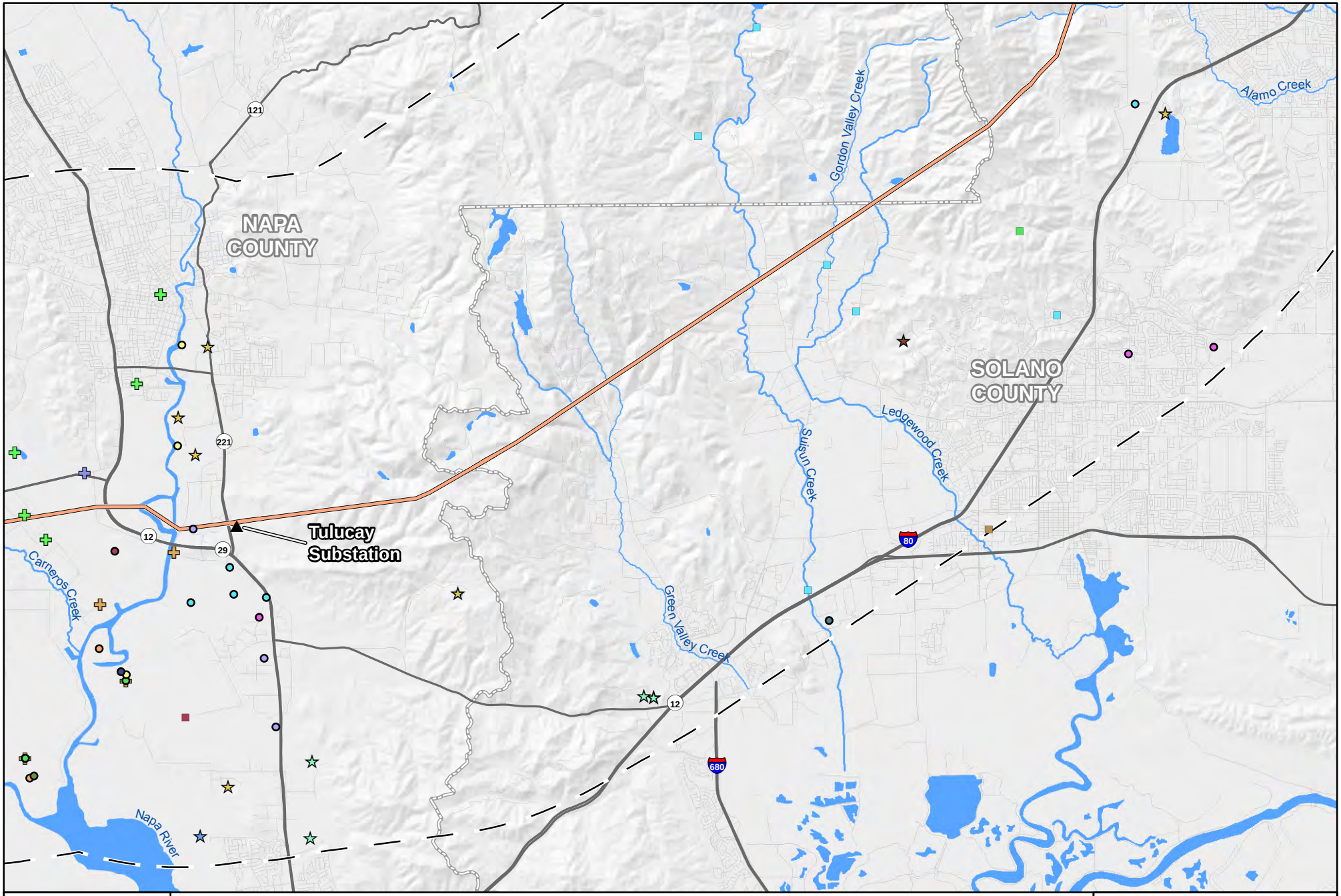
ATTACHMENT F:
CNDDB SPECIAL-STATUS WILDLIFE SPECIES OCCURRENCES (CONFIDENTIAL)



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment F: CNDDB Special-Status Wildlife Species Occurrences Map (1 of 3)

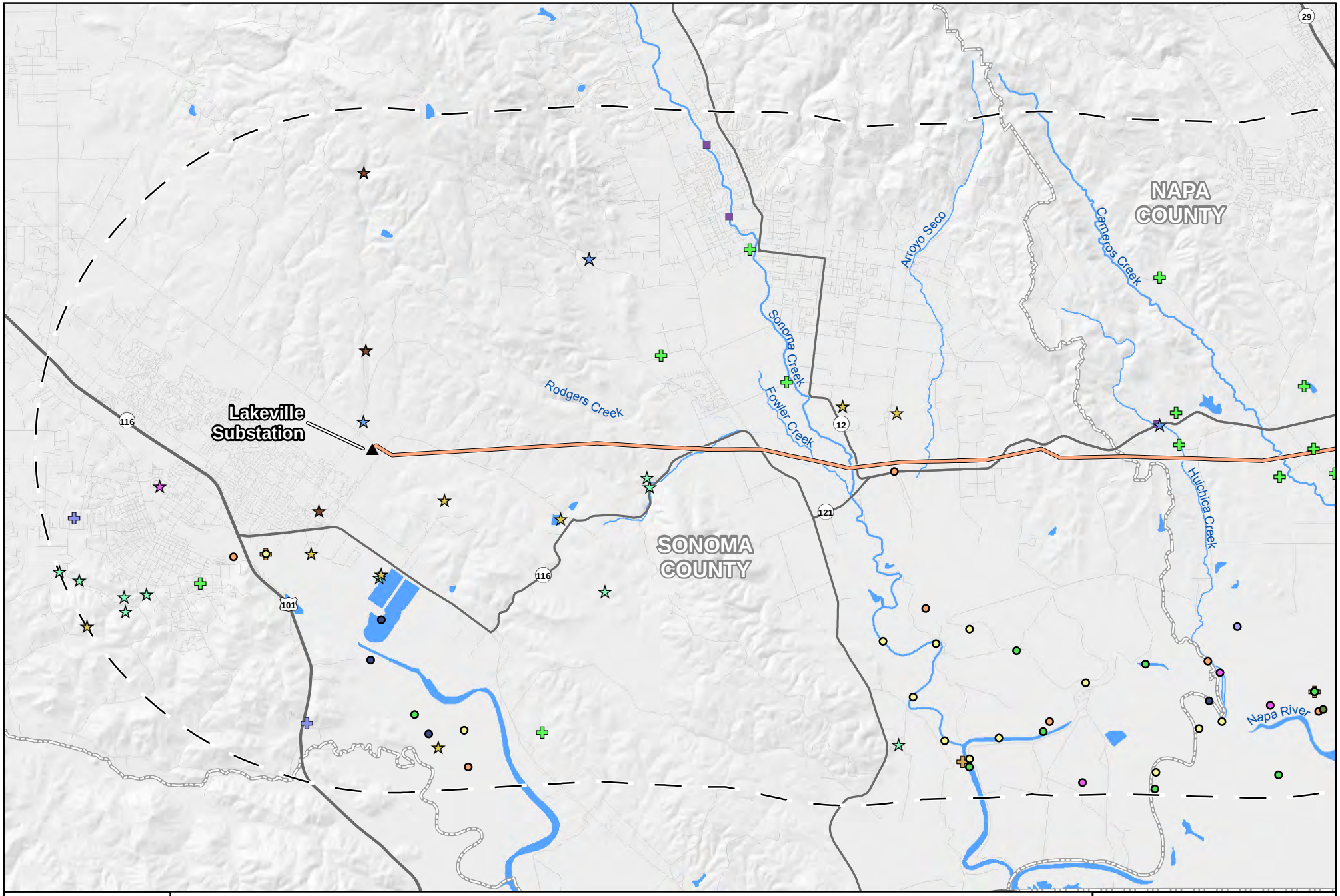
September 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment F: CNDDB Special-Status Wildlife Species Occurrences Map (2 of 3)

September 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment F: CNDDB Special-Status Wildlife Species Occurrences Map (3 of 3)

September 2013

ATTACHMENT G:
SPECIAL-STATUS PLANTS WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Special-Status Plants with Potential to Occur in the Project Area

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Sonoma alopecurus *Alopecurus aequalis* var. *sonomensis*	FE 1B.1	Occurs in freshwater marshes and swamps and riparian scrub. Known from Marin and Sonoma counties between 5-365 meters. Known from fewer than 10 occurrences.	May-July perennial herb	Suitable habitat is present within the project area. May be in riparian scrub in the Sonoma County portion of the project area. This taxon is highly restricted in distribution. Nearest recorded CNDDB occurrence is a specific location approximately 11 miles north in Annadel State Park.	Possible From Lakeville Substation to tower 184 Not observed during focused botanical surveys conducted in 2010 and 2011.
Franciscan onion *Allium peninsulare* var. *franciscanum*	1B.2	Occurs on clay in cismontane woodland and valley and foothill grassland often on serpentinitic sites. Known from Santa Clara, San Mateo, and Sonoma counties between 100 and 300 meters.	May-June perennial herb (bulbiferous)	Suitable grassland habitat is present in the project area however, preferred serpentine substrate is absent. The nearest recorded CNDDB occurrence is a non-specific location from a collection in 1880. Another occurrence is 3.8 miles northwest and includes plants growing among large cobbles in the understory of mixed hardwood forest on volcanic substrate. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Napa false indigo *Amorpha californica* var. *napensis*	1B.2	Occurs in broadleafed upland forest openings, chaparral, and cismontane woodland. Has been recorded between 120 and 2,000 meters.	April-July deciduous shrub	Suitable vegetation associations are present in the Sonoma Mountains vicinity between towers 172 and 177. Nearest recorded CNDDB occurrence is a specific location approximately 1.7 miles north, growing in the understory of oak woodland. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Sonoma Mountains vicinity Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
bent-flowered fiddleneck *Amsinckia lunaris*	1B.2	Occurs in coastal bluff scrub, cismontane woodland and valley and foothill grassland from 3 to 500 meters.	March-June annual herb	Suitable vegetation associations present in the Vaca and Sonoma Mountains between towers 86 and 104, and between towers 172 and 177. Nearest recorded CNDDB occurrence is non-specific location approximately 12 miles west in Marin County based on a collection from 1952. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Vaca and Sonoma Mountains Not observed during focused botanical surveys conducted in 2010 and 2011.
Sonoma canescent manzanita *Arctostaphylos canescens* subsp. *sonomensis*	1B.2	Occurs occasionally on serpentinitic sites in chaparral and lower montane coniferous forest between 180 and 1,675 meters.	January-June shrub (evergreen)	No suitable vegetation associations or substrate present in the project area. Vegetative material would have been detectable during the March 2011 site visits. Nearest recorded CNDDB occurrence is 8.2 miles north and is based on an historic collection. Plants were growing associated with chamise chaparral.	None
Mt. Tamalpais manzanita *Arctostaphylos montana* subsp. *montana*	1B.3	Occurs in chaparral and valley and foothill grassland on serpentinitic from 160-760 meters. Known from fewer than twenty occurrences in the Mt. Tamalpais area in Marin county.	February-April shrub (evergreen)	Although, suitable vegetation associations are present, the preferred serpentine substrate is absent. Vegetative material would have been detectable during the March 2011 site visits. Nearest recorded CNDDB occurrence is a non-specific location approximately 14 miles south near Novato.	None
Rincon manzanita *Arctostaphylos stanfordiana* subsp. *decumbens*	SC 1B.1	Occurs in rhyolitic chaparral and cismontane woodland. Known from Napa and Sonoma counties between 75 and 370 meters.	February-April shrub (evergreen)	Suitable vegetation associations are present but rhyolitic substrate is absent. This taxon is highly restricted to red rhyolites in Sonoma County. The nearest recorded CNDDB occurrence is a specific location 15 miles north on all old quarry.	None

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Marin manzanita *Arctostaphylos virgata*	1B.2	Occurs on sandstone or granitic sites in broadleafed upland forest, closed-cone coniferous forest, chaparral, and North Coast coniferous forest. Known only from Marin County between 60 and 700 meters.	January-March shrub (evergreen)	No suitable vegetation associations or substrate present within the project area. Vegetative material would have been detectable during the March 2011 site visits. This taxon is only known from Marin County. Nearest recorded CNDDB occurrence is a specific location approximately 18 miles south of the project area.	Absent
Clara Hunt's milk-vetch *Astragalus claranus*	FE ST 1B.1	Occurs on serpentinitic, volcanic, rocky, or clayey sites in openings of chaparral, cismontane woodland, and valley and foothill grassland. Known from Napa and Sonoma counties between 75-275 meters from only five occurrences.	March-May annual herb	Although suitable vegetation associations and volcanic substrates are present within the project area this taxon is highly restricted in distribution in the vicinity of St. Helena. Nearest recorded CNDDB occurrence is a specific location approximately 11 miles north, just south of St. Helena.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Ferris' milk-vetch *Astragalus tener* var. *ferrisiae*	1B.2	Occurs in vernally mesic meadows and seeps and valley and foothill grassland on subalkaline flats. Presumed extirpated from Solano County. Not known to occur in Sonoma or Napa counties.	April-May annual herb	Suitable vegetation associations and substrates are present but subalkaline flats are absent. Nearest recorded CNDDB occurrence is a non-specific location approximately 9.4 miles east. Not observed during focused botanical surveys conducted in 2010 and 2011. May occur in the Sacramento Valley between 3 and 10.	Possible in the Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
alkali milk-vetch *Astragalus tener* var. *tener*	1B.2	Occurs on alkaline substrates in playas, valley and foothill grassland on adobe clay, and vernal pools between 1 and 60 meters.	March-June annual herb	Suitable vegetation associations and alkaline soils are present in the Napa River vicinity and Sacramento Valley near towers 3 –10 and 110. Nearest recorded CNDDB occurrence is an extirpated location approximately 0.1 mile north of project area near the Napa River. This area was destroyed during construction of an office park and the site is currently occupied by fill soil and disturbed grassland vegetation. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Napa River vicinity and Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
Heartscale *Atriplex cordulata*	1B.2	Occurs in chenopod scrub, meadows and seeps, valley and foothill grassland on sandy, saline or alkaline substrates between 1 and 375 meters.	April-October annual herb	Although suitable vegetation associations are present, soils with and elevated pH and scalded habitat are absent. Nearest recorded CNDDB occurrence is 4.5 miles southeast and is based on an historic collection. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Brittlescale *Atriplex depressa*	1B.2	Occurs in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools on alkaline clay substrates at an elevation of 1 and 320 meters.	May-October annual herb	Although suitable vegetation associations are present, soils with and elevated pH and scalded habitat are absent. Nearest recorded CNDDB occurrence is 5.2 miles southeast in an alkali meadow east of Fairfield. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
San Joaquin spearscale *Atriplex joaquinana*	1B.2	Occurs in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland on alkaline substrates from 1 to 835 meters elevation.	April-October annual herb	Habitat is present in the project area in the Napa River vicinity and Sacramento Valley near towers 3 through 10 and tower 110. Nearest recorded CNDDB occurrence is a specific location approximately 1.5 miles north on west side of Napa River. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Napa River vicinity and Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
vernal pool smallscale *Atriplex persistens*	1B.2	Occurs in vernal pools on alkaline substrates from 10-115 meters.	June-October annual herb	Although suitable vegetation associations are present the appropriate playa microhabitat is absent. Nearest recorded CNDDB occurrence is 10 miles southeast at Jepson Prairie, located in a large playa vernal pool. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	1B.2	Occurs in chaparral, cismontane woodland, and valley and foothill grassland, sometimes on serpentinite between 90-1,400 meters.	March-June perennial herb	Suitable habitat is present in the project area from the Vaca Range to the Napa River between towers 22 and 104 and in the Sonoma Mountains vicinity between towers 172 and 177. The nearest recorded CNDDB occurrence is a historic non-specific location approximately 1.2 miles south of the project area in rocky hill slopes in the vicinity of Green Valley. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible from the Vaca Range to the Napa River and in the Sonoma Mountains vicinity Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Sonoma sunshine *Blennosperma bakeri*	FE SE 1B.1	Occurs in mesic valley and foothill grassland and vernal pools. Known only from Sonoma County from the Laguna de Santa Rosa and Sonoma area between 10-110 meters.	March-May annual herb	This species is present within the project area and occurs south of the span between towers 160 and 161 in a wet depression in non-native grassland habitat. It was observed as a single population (approximately 75 individuals) during a March 2011 survey and at the time of the survey, occurred in 3-4 inches of water. Two CNDDB occurrences are present within 1 mile of the project area and two additional occurrences are within 3 miles, all near the City of Sonoma.	Present South of the span between towers 160 and 161.
narrow-anthered California brodiaea *Brodiaea californica* var. *leptandra*	1B.2	Occurs on volcanic sites in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. Known from Lake, Napa, and Sonoma counties between 110 and 915 meters.	May-July bulbiferous herb	Habitat, including suitable vegetation communities and volcanic geology are present from Suisun Valley to the Napa river between towers 74 and 104. Nearest recorded CNDDB occurrence is a specific location 1.6 miles north on Arrowhead Mountain under oaks on a wooded slope on rhyolite soils. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible From Suisun Valley to the Napa River Not observed during focused botanical surveys conducted in 2010 and 2011.
round-leaved filaree *California macrophylla*	1B.1	Occurs in cismontane woodland, valley and foothill grassland on clay soils. Known from throughout California between 15 and 1,200 meters.	March-May annual herb	Suitable vegetation associations and substrate are present in the project area. Nearest recorded CNDDB occurrence is a non-specific location based on a historical collection near Sonoma. This species may occur in upland habitat throughout the project area. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in all upland habitat within the project area Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
small-flowered Calycadenia *Calycadenia micrantha*	1B.2	Occurs on roadsides, rocky, talus, scree, sometimes serpentinitic, sparsely vegetated areas in chaparral, meadows and seeps on volcanic substrates, and valley and foothill grassland from 5 to 1,500 meters elevation. Occurs in Napa County.	June-September annual herb	Suitable habitat is not present in portion of the project occurring in Napa County. This species is not known from Solano or Sonoma counties; however potential habitat is present from the English Hills east to the Napa River between towers 22 and 104. Nearest recorded CNDDB occurrence is a specific location 11.8 miles north. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible from the English Hills east to the Napa River Not observed during focused botanical surveys conducted in 2010 and 2011.
Sonoma white sedge *Carex albida*	FE SE 1B.1	Occurs in bogs, fens, and freshwater marshes and seeps. Known only from Sonoma County at one confirmed extant occurrence at Pitkin Marsh. Has been recorded as occurring between 15-90 meters.	May-July rhizomatous herb	Suitable vegetation associations are present; however, this taxon is highly limited in distribution. Nearest recorded CNDDB occurrences a non-specific location along Santa Rosa Creek that is likely extirpated. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Tiburon Indian paintbrush *Castilleja affinis* subsp. *neglecta*	FE ST 1B.2	Occurs on serpentine valley and foothill grassland. Known from six occurrences in Marin, Napa, and Santa Clara counties from between 60-400 meters.	April-June perennial herb	Although suitable vegetation associations are present the preferred serpentine substrate is absent within the project area. This species is not known from Sonoma or Solano counties. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Rincon Ridge Ceanothus *Ceanothus confusus*	1B.1	Occurs in closed-cone coniferous forest, chaparral, and cismontane woodland on volcanic or serpentinitic substrates from 75 to 1,065 meters elevation.	February-June shrub (evergreen)	Although suitable cismontane woodland habitat on volcanic soils is present, the project is outside of the species range. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Calistoga Ceanothus *Ceanothus divergens*	1B.2	Occurs on rocky, serpentinitic, or volcanic sites in chaparral from 170 to 950 meters.	February-April shrub (evergreen)	No suitable vegetation associations (chaparral) are present in the project area. The project occurs outside of the species range.	None
holly-leaved Ceanothus *Ceanothus purpureus*	1B.2	Occurs on rocky or volcanic sites in chaparral and cismontane woodland from 120 to 640 meters elevation.	February-June shrub (evergreen)	Suitable cismontane woodland habitat on volcanic soils is present in the project area. Species is present immediately adjacent to the project area north of the span between towers 90 and 91. Species observed within 300 feet northwest of the edge of the project area in Solano County near the Napa County boundary. Outside of project area and not nearby any potential access roads.	Present[3] Immediately adjacent to the project area north of the span between towers 90 and 91
Sonoma Ceanothus *Ceanothus sonomensis*	1B.2	Occurs on sandy, serpentinitic, or volcanic sites in chaparral. Known only from Sonoma County from approximately ten occurrences between 215 and 800 meters.	February-April shrub (evergreen)	Chaparral habitat is not present in the project area.	None
pappose tarplant *Centromadia parryi* subsp. *parryi*	1B.2	Occurs in coastal prairie, meadows and seeps, coastal salt marshes and swamps and vernally mesic valley and foothill grassland often in alkaline soils between 2 and 420 meters.	May-Nov annual herb	Suitable vegetation associations are present within the project area near the Napa River and south of the Town of Sonoma. Nearest recorded CNDDB occurrence is 2 miles south and is a non-specific location in the vicinity of the Town of Sonoma. There are 5 additional occurrences within 5 miles of the project area. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the vicinity of the Sacramento Valley, Napa River, and Sonoma Valley Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Sonoma spineflower *Chorizanthe valida*	FE SE 1B.1	Occurs in sandy coastal prairie. Known only from Marin County. Presumed extirpated from Sonoma County. Has been recorded as occurring between 10-305 meters. Only extant occurrence was rediscovered in 1980 at Pt. Reyes. Closely related to *C. pungens*.	June-August annual herb	No suitable vegetation associations or sandy substrates present within the project area. Nearest recorded CNDDB occurrence is a non-specific location approximately 3.5 miles west in Petaluma that is likely extirpated.	None
Sonoma spineflower *Chorizanthe valida*	1B.1	Occurs in coastal prairie habitat in sandy soils in Marin and Sonoma counties from 10 to 50 meters.	June-August annual herb	No suitable vegetation associations or sandy soils present. The nearest recorded CNDDB occurrence is approximately 3.1 miles west in what is now downtown Petaluma.	None
Bolander's water hemlock *Cicuta maculata* var. *bolanderi*	2.1	Occurs in coastal, fresh or brackish water marshes and swamps. Known from Contra Costa, Marin, Sacramento, and Solano counties and from Arizona, New Mexico, and Washington from 0 to 200 meters.	July-September perennial herb	Suitable vegetation associations are present within the project area near the Napa River between towers 110 and 118. Nearest recorded CNDDB occurrence is a non-specific historic location approximately 7 miles south near Suisun Marsh, growing with *Typha* sp. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the Napa River vicinity Not observed during focused botanical surveys conducted in 2010 and 2011.
Suisun thistle *Cirsium hydrophilum* var. *hydrophilum*	FE 1B.1	Occurs in salt marshes and swamps. Known from only four occurrences in Solano County at an elevation of 0-1 meters.	June-September perennial herb	Although marginally suitable habitat is present in the project area near the Napa River, this taxon is not known from Napa County. This taxon is highly restricted in distribution and is known only from Suisun Marsh. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Mt. Tamalpais thistle *Cirsium hydrophilum* var. *vaseyi*	1B.2	Occurs on serpentine seeps in broadleafed upland forest, chaparral, and meadows and seeps. Known from fewer than 20 occurrences on Mt. Tamalpais in Marin County between 240-620 meters. Not known from Napa, Sonoma, or Solano counties.	May-August perennial herb	Suitable vegetation associations are present but serpentine substrate is absent. This species is highly restricted in distribution and is not known to occur in Napa, Sonoma, or Solano counties.	None
Point Reyes bird's-beak *Cordylanthus maritimus* subsp. *palustris*	1B.2	Occurs in coastal salt marshes and swamps. Known from California and Oregon from 0 to10 meters.	June-October annual herb hemiparasitic	No suitable habitat is present within the project area and the project is outside of the species range. Nearest recorded CNDDB occurrence is approximately 5 miles south in Petaluma Marsh. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
hispid bird's-beak *Cordylanthus mollis* subsp. *hispidus*	1B.1	Occurs on alkaline substrates in meadows and seeps, playas, and valley and foothill grassland between 1 and 155 meters.	June-September annual herb (hemiparasitic)	Suitable vegetation associations are present; however, the project area is out of the range of this species. The nearest recorded CNDDB occurrence is south of Travis Air Force Base. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
soft bird's-beak *Cordylanthus mollis* subsp. *mollis*	FE SR 1B.2	Occurs in coastal salt marshes and swamps. Known from fewer than 20 locations in Contra Costa, Napa, and Solano counties from between 0-3 meters. Presumed extirpated in Marin, Sacramento, and Sonoma counties.	July-November annual herb (hemiparasitic)	Marginally suitable habitat is present in the Napa River vicinity between towers 110 and 118. Nearest recorded CNDDB occurrence is a specific location 1.8 miles south in a pickleweed marsh in Fagan Slough, a slough of the Napa River. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the Napa River vicinity between towers 110 and 118 Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
serpentine Cryptantha *Cryptantha dissita*	1B.1	Occurs in chaparral on serpentinite substrates. Known from Lake, Napa, and Sonoma counties between 395 and 580 meters elevation.	April-June annual herb	Suitable vegetation associations and serpentine substrates are absent. Nearest recorded CNDDB occurrence is 12.5 miles north and is based on a historic collection.	None
yellow larkspur *Delphinium luteum*	FE SR 1B.1	Occurs on rocky sites in chaparral, coastal prairie, and coastal scrub. Known from Marin and Sonoma counties between 0-100 meters from only four occurrences. This taxon hybridizes with *D. nudicaule*.	March-May perennial herb	No suitable vegetation associations are present. Highly restricted distribution and only known from coastal Sonoma and Marin counties. Nearest recorded CNDDB occurrence is a non-specific location 4.6 miles southwest of the project area west of Petaluma.	None
recurved larkspur *Delphinium recurvatum*	1B.2	Occurs on alkaline substrates in chenopod scrub, cismontane woodland, and valley and foothill grassland between 3 and 750 meters.	March-June perennial herb	Suitable vegetation associations are present but alkaline scalds are not present in the project area. The nearest recorded CNDDB occurrence is 1.6 miles south, just north of Vacaville. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
western leatherwood *Dirca occidentalis*	1B.2	Occurs on mesic sites in broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian scrub, and riparian woodland. Populations declining because of poor reproduction. Occurs between 50-395 meters. Occurs in Sonoma County.	January-April shrub (deciduous)	Although suitable vegetation associations are present in the project area, this species is restricted to coastal habitat within the fog incursion zone. It would have been detectable during the March 2011 site visits. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
dwarf Downingia *Downingia pusilla*	2.2	Occurs in mesic sites in valley and foothill grassland and vernal pools from between 0 and 10 meters.	March-May annual herb	Suitable habitat is present in the vicinity of Sacramento Valley, Napa River, and Sonoma Valley. There are 2 recorded CNDDB occurrences within the project area – the first just east of the Napa River in vernal pool habitat and the second, based on a historic collection collected in the vicinity of Schellville, south of Sonoma. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the vicinity of Sacramento Valley, Napa River, and Sonoma Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
Koch's cord moss *Entosthodon kochii*	1B.3	Occurs on soil in cismontane woodland. Known from between 180 and 1,000 meters. Not known from Sonoma, Napa, or Solano counties.	rainy season moss	Suitable habitat is present; however, project is outside of the species range. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Greene's narrow-leaved daisy *Erigeron greenei*	1B.2	Occurs in chaparral on serpentinitic or volcanic substrates from 80-1,005 meters elevation.	May-September perennial herb	No suitable vegetation associations are present in the project area. The nearest recorded CNDDB occurrence is a non-specific location 9 miles north between the Town of Napa and Yountville based on an historical collection.	None
Tiburon buckwheat *Eriogonum luteolum* var. C*aninum*	1B.2	Occurs in chaparral, coastal prairie and valley and foothill grassland on serpentinitic substrates. Location information needed. Not clearly distinguishable from var. *luteolum*. Presumed extirpated from Sonoma and Solano counties.	June-September annual herb	Although suitable vegetation associations are present, the preferred substrate is absent from the project area. Nearest recorded CNDDB occurrence is a specific location approximately 14 miles south near Nicasio in MRM County. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Mt. Diablo buckwheat *Eriogonum truncatum*	1B.1	Occurs on sandy sites in chaparral, coastal scrub, and valley and foothill grassland. Known from Contra Costa County between 3-350 meters. Presumed extirpated from Alameda and Solano counties. Rediscovered in May 2005, now known from one extant natural occurrence.	April-September annual herb	Although suitable vegetation associations are present within the project area, this species is highly restricted in distribution and currently is only known in Contra Costa County. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Marin checker lily *Fritillaria lanceolata* var. *Tristulis*	1B.1	Occurs in coastal bluff scrub, coastal prairie, and coastal scrub. Known from Marin and San Mateo counties between 15 and 150 meters.	February-May bulbiferous herb	Suitable habitat is absent and the project is located outside of the species range.	None
fragrant fritillary *Fritillaria liliacea*	1B.2	Occurs in cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland near the coast, on clay or serpentinitic soils between 3 and 410 meters.	February-April perennial herb (bulbiferous)	Suitable vegetation associations and clay soils are present. This species may occur in upland habitat within the project area. Nearest recorded CNDDB occurrence is 9 miles south on Mount Burdell. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in all upland habitat in the project area Not observed during focused botanical surveys conducted in 2010 and 2011.
adobe-lily *Fritillaria pluriflora*	1B.2	Occurs in chaparral, cismontane woodland, and valley and foothill grassland often on adobe clay. Occurs in northern California from 60 to 705 meters elevation.	February-April perennial herb (bulbiferous)	Suitable vegetation associations and clay soils are present in the Vaca Mountains vicinity between towers 22 – 63. Nearest recorded CNDDB occurrence is 3 miles south based on an historic collection near Vacaville. A second CNDDB occurrence is 6 miles east near Dixon. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Vaca Mountains vicinity Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Boggs Lake hedge-hyssop *Gratiola heterosepala*	SE 1B.2	Occurs in marshes and swamps (lake margins) and vernal pools in clay soil. Found in California between 10-2,175 meters.	April-August annual herb	Marginally suitable habitat occurs in the Sacramento Valley vicinity between towers 3 and 10. Not known from Napa or Sonoma counties. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the Sacramento Valley vicinity between towers 3 and 10. Not observed during focused botanical surveys conducted in 2010 and 2011.
pale yellow hayfield tarplant *Hemizonia congesta* subsp. *congesta*	1B.2	Occurs in valley and foothill grassland sometimes on roadsides between 20 and 560 meters. Occurs in Sonoma County; not known to occur in Napa or Solano counties.	April-November annual herb	Suitable vegetation associations are present within the project area west of the Napa River between towers 117 and Lakeville Substation. Nearest recorded CNDDB occurrence is a historic record 2 miles north, near the Town of Sonoma. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible West of the Napa River and adjacent to Lakeville Substation Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
two-carpellate western flax *Hesperolinon bicarpellatum*	1B.2	Occurs in chaparral on serpentinitic substrates. Previously confused with *H. serpentinum* which also occurs on serpentinitic soils in the same general area. Known from Lake, Napa, and Sonoma counties between 60 and 1105 meters.	May-July annual herb	No suitable vegetation associations or serpentinitic substrate present. The nearest recorded CNDDB occurrence is a non-specific location 12 miles north near Lake Berryessa based on an historic collection.	None

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Brewer's western flax *Hesperolinon breweri*	1B.2	Occurs in chaparral, cismontane woodland, and valley and foothill grassland usually on serpentinitic soils at elevations from 30 to 900 meters. Known from Contra Costa, Napa, and Solano counties.	May-July annual herb	Suitable vegetation associations are present within the project area but serpentinitic substrates are absent. May occur in the Vaca Mountains vicinity between towers 39 and 72. The nearest recorded occurrence is 1.6 miles north in the Upper Suisun Valley and is based on an historic occurrence. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Vaca Mountains Not observed during focused botanical surveys conducted in 2010 and 2011.
Marin western flax *Hesperolinon congestum*	FT ST 1B.1	Occurs on serpentine in chaparral and valley and foothill grassland. Protected in part at Ring Mountain Preserve in Marin County. Known from fewer than twenty occurrences. Not known from Solano, Sonoma, or Napa counties.	April-July annual herb	Although suitable vegetation associations are present the preferred serpentine substrate is absent within the project area. The project occurs outside the known range of this species.	None
Napa western flax *Hesperolinon serpentinum*	1B.1	Occurs in chaparral on serpentinitic substrates. Fewer than twenty occurrences. Occurs in Napa County between 50 and 800 meters.	May-July annual herb	No suitable vegetation associations or serpentinitic substrate present. The nearest recorded CNDDB occurrence is 5 miles north in chaparral habitat on Mt. George.	None
Tehama County western flax *Hesperolinon tehamense*	1B.3	Occurs in serpentine barrens in chaparral between 100 and 1250 meters.	May-July annual herb	No suitable vegetation associations or serpentine substrate present. The nearest recorded CNDDB occurrence is approximately 1.6 miles north in serpentine substrate in Skyline Wilderness Park.	Not Expected
woolly rose-mallow *Hibiscus lasiocarpos* var. *occidentalis*	2.2	Occurs in marshes and swamps counties from between 0 and 120 meters.	June-September perennial rhizomatous herb aquatic, emergent	Suitable vegetation associations are present but hydrologic regimes typical of the Delta are absent. The nearest recorded CNDDB occurrence is 11 miles east on a slough bank.	None

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
thin-lobed Horkelia *Horkelia tenuiloba*	1B.2	Occurs on sandy, mesic openings in broadleafed upland forest, chaparral, and valley and foothill grasslands. Known from Mendocino, Marin, and Sonoma counties between 50 and 500 meters.	May-July perennial herb	Suitable habitat is present; however, sandy soils in these vegetation associations are absent. This species is restricted to coastal habitat within the fog incursion zone. Nearest recorded CNDDB occurrence is approximately 6.5 miles north. The plants were observed on steep, bare, cliffs on mixed ash and harder volcanic substrates, growing among *Rhododendron occidentale.* Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Carquinez goldenbush *Isocoma arguta*	1B.1	Occurs in valley and foothill grassland, often on alkaline soils. Known only from Solano County from between 1 and 20 meters elevation.	August-December perennial shrub	Suitable habitat is present; however, soils with elevated pH and scalded habitat are absent. It would have been detectable during March 2011 site visits. Nearest recorded CNDDB occurrence is approximately 6 miles south, collected in "subsaline plains." Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Northern California black walnut *Juglans hindsii*	1B.1	Occurs in riparian forest and riparian woodland. Known from Contra Costa and Napa counties between 0 and 440 meters. Individuals that were extant before 1840 are considered native, all others are considered waifs.	April-May deciduous tree	Suitable habitat within the appropriate elevation range occurs in the project area in Napa County. This species would have been detectable during March 2011 site visits. Nearest recorded CNDDB occurrence is approximately 2.7 miles north in the Town of Napa which is considered extirpated. Walnut trees in the project area are considered waifs. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Within suitable habitat of appropriate Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Burke's goldfields *Lasthenia burkei*	FE SE 1B.1	Occurs in mesic meadows and seeps and vernal pools. Known from Lake, Mendocino, Napa, and Sonoma counties between 15-600 meters.	April-June annual herb	Marginally suitable annual grassland habitat is present in the project area; however, this taxon has never been recorded from the vicinity of Petaluma or Sonoma Valley east. The project occurs outside the known range of this species. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Contra Costa goldfields *Lasthenia conjugens*	FE 1B.1	Occurs in cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools. Occurs on mesic sites between 0-470 meters.	March-June annual herb	Suitable habitat is present in the Napa River vicinity and west including towers 92 through 110, 132 through 139, 141, and 147 through 172. Nearest recorded CNDDB occurrence is a specific location approximately 0.14 mile south of the project area near Suscol Creek. A second CNDDB occurrence is a specific location approximately 1.1 miles north, near the Napa River that is presumed extirpated. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the Napa River vicinity and west. Not observed during focused botanical surveys conducted in 2010 and 2011.
Delta tule pea *Lathyrus jepsonii* var. *Jepsonii*	1B.2	Occurs in freshwater and brackish marshes in Napa and Solano counties from 0 to 4 meters.	May-September perennial herb	Suitable vegetation associations are present in the project area within the Napa River vicinity between towers 110 and 118. There are three CNDDB occurrences within the vicinity of the project area where it crosses the Napa River. These occurrences were found alongside the river as herbaceous understory. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Napa River vicinity Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Colusa layia *Layia septentrionalis*	1B.2	Occurs on sandy or serpentinitic sites in chaparral, cismontane woodland, and valley and foothill grassland. Occurs in Napa and Sonoma counties between 100 and 1,095 meters.	April-May annual herb	Although suitable vegetation associations are present the preferred serpentine substrate is absent. The project area is outside of the species range. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Legenere *Legenere limosa*	1B.1	Occurs in vernal pools. Occurs in Napa, Sonoma, and Solano counties between 1-880 meters.	April-June annual herb	Suitable habitat may be present in the project area in the vicinity of Sacramento Valley, Napa River, and Sonoma Valley. Nearest recorded CNDDB occurrence is located 0.1 mile south of the project area in vernal pool habitat beneath a power line. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible In the vicinity of the Sacramento Valley, Napa River, and Sonoma Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
Heckard's pepper-grass *Lepidium latipes* var. *heckardii*	1B.2	Occurs in valley and foothill grassland on alkaline flats. Occurs in Sonoma County.	March-May annual herb	Suitable habitat is present in the Sacramento Valley between towers 3 –10. Nearest recorded CNDDB occurrence is located approximately 10 miles southeast near Dozier. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
Jepson's Leptosiphon *Leptosiphon jepsonii*	1B.2	Usually occurs on volcanic sites in chaparral and cismontane woodland. Known from lake, Napa, and Sonoma counties between 100 and 500 meters.	March-May annual herb	Suitable vegetation associations and volcanic substrate are present in the Sonoma Mountains vicinity between towers 172 and 177. The nearest recorded CNDDB occurrence is 6.3 miles north of the project area on Sonoma Mountain. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Not observed during focused botanical surveys conducted in 2010 and 2011

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Mason's Lilaeopsis *Lilaeopsis masonii*	CR 1B.1	Occurs in brackish or freshwater marshes and swamps, riparian scrub between 0-10 meters.	April-November perennial herb (rhizomatous)	Present within tidal habitat of the Napa River between towers 112 and 115. Observed during a May 2011 kayak survey over a large area (estimated more than 100,000 individuals). Nearest recorded CNDDB occurrence is approximately 1 mile north on the margins of the Napa River, growing along the riverbank on wood pilings.	Present Within tidal habitat of the Napa River between Towers 112 and 115.
Sebastopol meadowfoam *Limnanthes vinculans*	FE SE 1B.1	Occurs on vernally mesic sites in meadows and seeps, valley and foothill grassland, and vernal pools. Known from Sonoma County and may possibly occur in Napa County. Has been recorded between 15-305 meters.	April-May annual herb	Suitable vegetation associations and hydrology are present in the Sonoma Valley between towers 144 through 170. Nearest recorded CNDDB occurrence is a non-specific location approximately 1 mile south near the Sonoma Mountains that may not be native. Most occurrences are west of Santa Rosa. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Sonoma Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
Delta mudwort *Limosella subulata*	2.1	Occurs in marshes and swamps between 0 and 3 meters. Known from northern California, Oregon, and elsewhere.	May-August perennial herb (stoloniferous)	Suitable vegetation associations are present in the project area; however, hydrologic regime typical of the Delta is absent. Nearest recorded CNDDB occurrence is 12 miles southeast on the muddy banks of Calhoun Cut.	None
Cobb Mountain lupine *Lupinus sericatus*	1B.2	Occurs in broadleafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest. Occurs in Napa and Sonoma counties between 275 and 1,525 meters.	March-June perennial herb	Although suitable vegetation associations are present in the project area the project area is outside of the known species range. Nearest recorded CNDDB occurrence is 7 miles north in a Douglas fir forest. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
marsh Microseris *Microseris paludosa*	1B.2	Occurs in closed-cone coniferous forest, cismontane woodland, coastal scrub and valley and foothill grassland between 5 and 300 feet.	April-June perennial herb	Although suitable vegetation associations are present in the project area, this species occurs nearer the coast within the fog incursion zone. Nearest recorded CNDDB occurrence is a historic location 6 miles north, near Petaluma. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
robust monardella *Monardella villosa* subsp. *Globosa*	1B.2	Occurs in chaparral openings, cismontane woodland, and coastal scrub between 100 and 915 meters.	June-July rhizomatous herb	Although suitable vegetation associations are present, this species was not observed during focused botanical surveys conducted in 2010 and 2011. Nearest recorded CNDDB occurrence is a non-specific location approximately 12 miles north near Lake Berryessa.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Baker's navarretia *Navarretia leucocephala* subsp. *bakeri*	1B.1	Occurs on mesic sites in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools between 5 and 1,740 meters.	April-July annual herb	Present east of Interstate 505 between towers 5 and 8. A single population (approximately 8,000 individuals) recorded on North Remy Preserve during 2011 field surveys. Comprises several colonies that occupy natural vernal pools and created wetlands in an area grazed by cattle. Multiple CNDDB occurrences are within 10 miles of the project area.	Present
few-flowered navarretia *Navarretia leucocephala* subsp. *pauciflora*	FE ST 1B.1	Occurs in vernal pools in volcanic ash flow. Known from Lake and Napa counties from 400- 855 meters elevation from fewer than 10 occurrences.	May-June annual herb	Suitable vegetation associations on the specific substrate are absent in the project area within the required elevation range. No suitable habitat present.	None

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Marin County Navarretia *Navarretia rosulata*	1B.2	Occurs on rocky serpentine sites in closed-cone coniferous forest and chaparral. Known from Marin and Napa counties between 200 and 635 meters.	May-July annual herb	No suitable vegetation associations or serpentine substrates present within the project area. Nearest CNDDB occurrence is 18 miles south of the project area.	None
Colusa grass *Neostapfia colusana*	FT SE 1B.1	Occurs in large vernal pools with adobe clay soils between 5 and 200 meters.	May-August annual herb	Suitable habitat is present in the Sacramento Valley between towers 3 and 10. Nearest recorded CNDDB occurrence is a specific location collected on Wilcox Ranch near Jepson Prairie 10.5 miles south of the project area. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	FT SE 1B.1	Occurs in vernal pools between 10-755 meters in Solano County. This species is not known from Napa or Sonoma counties.	April-September annual herb	Suitable habitat is present in the Sacramento Valley between towers3 and 10. Nearest recorded CNDDB occurrence is a specific location 9.5 miles south of the project area in an alkali playa pool. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.
Sonoma beardtongue *Penstemon newberryi* var. *Sonomensis*	1B.3	Rocky chaparral. Known from Lake, Napa, and Sonoma counties from fewer than twenty occurrences between 700 and 1370 meters.	April-August perennial herb	No suitable vegetation associations present within the project area. Nearest recorded CNDDB occurrence is 13.2 miles north of the study site.	None
bearded popcorn-flower *Plagiobothrys hystriculus*	1B.1	Occurs in mesic valley and foothill grassland, vernal pools margins, and vernal swales. Known from Solano County from 0 to 274 meters elevation. Known only from the Montezuma Hills.	April-May annual herb	Species present in the project area west of Interstate 505 between towers 8 and 10 in a field west of Interstate 505. Approximately 175 individuals were observed during the 2011 surveys. Species range is highly restricted and previously only known to the Montezuma Hills area. The nearest CNDDB occurrence is 9.6 miles from the project area.	Present

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Petaluma popcorn-flower *Plagiobothrys mollis* var. *vestitus*	1A	Occurs on coastal salt marshes and swamps and mesic valley and foothill grasslands. Presumed extirpated from Sonoma County where it was recorded between 10 and 50 meters. Known only from the type collection near Petaluma.	June-July perennial herb	Suitable vegetation associations present. Only recorded CNDDB occurrence is 2.3 miles northwest of the project area based on a 1932 collection that is considered extirpated. Species is considered extirpated in Sonoma County. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Hoover's semaphore grass *Pleuropogon hooverianus*	ST 1B.1	Occurs in open and mesic areas in broadleafed upland forest, meadows and seeps, and North Coast coniferous forest. Occurs in Sonoma County between 10-671 meters.	April-August rhizomatous herb	Suitable habitat is present occur west of Napa River between towers 117 through 166. Nearest recorded CNDDB occurrence is a specific location approximately 8 miles north in a freshwater marsh/ seasonal wet drainage ditch along a road. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible West of the Napa River between towers Not observed during focused botanical surveys conducted in 2010 and 2011.
Marin knotweed *Polygonum marinense*	3.1	Occurs in coastal salt or brackish marshes and swamps. Known from Marin, Napa, Solano, and Sonoma counties from 0 to 10 meters elevation. Known from fewer than twenty occurrences.	April-October annual herb	Suitable vegetation associations and tidally influenced habitat are present within the project area in the Napa River vicinity between towers 110 and 118. There are two CNDDB occurrences within two miles of the project area located south along the Napa River. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Napa River vicinity Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Tamalpais oak *Quercus parvula* var. *Tamaplaisensis*	1B.3	Occurs in lower montane coniferous forest. Known only from Marin county between 100 and 750 meters elevation. Known only from Mt. Tamalpais.	March-April evergreen shrub	No suitable vegetation associations present. Species would have been detectable during the March 2011 site visit. Taxon is highly restricted in distribution and only occurs on Mt. Tamalpais.	None

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
California beaked-rush *Rhynchospora californica*	1B.1	Occurs in bogs and fens, lower montane coniferous forest, meadows and seeps and freshwater marshes and seeps from fewer than ten occurrences between 45 and 1010 meters.	May-July perennial herb (rhizomatous)	The project is located within suitable habitat of the appropriate elevational range and hydrology is present. The nearest CNDDB occurrence is 5.4 miles north on western slope of Mount George. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Within suitable habitat of appropriate elevational range Not observed during focused botanical surveys conducted in 2010 and 2011.
Point Reyes checkerbloom *Sidalcea calycosa* subsp. *rhizomata*	1B.2	Occurs in freshwater marshes and swamps near the coast. Known from Mendocino, Marin, and Sonoma counties between 3 and 75 meters.	April-September rhizomatous herb	Suitable vegetation associations present, however the project is outside of the species range (occurs closer to the coast). The nearest CNDDB occurrence is a historic location 3.4 miles from the project area.	None
Marin checkerbloom *Sidalcea hickmanii* var. *Viridis*	1B.3	Occurs in chaparral on serpentine soils. Known from Marin, Napa, and Sonoma counties between 50 and 430 meters.	May-June perennial herb	No suitable vegetation associations or serpentine soils present within the project area. The nearest recorded CNDDB occurrence is 7 miles west on Big Carson Ridge.	None
Keck's checkerbloom *Sidalcea keckii*	FE 1B.1	Occurs in cismontane woodland and valley and foothill grassland on serpentinitic or clay substrates from 75-650 meters.	April-June annual herb	Suitable habitat is present from the Vaca Range to the Napa River between towers 22 and 104. Nearest recorded CNDDB occurrence is a non-specific location approximately 7.3 miles north in the Vaca Mountains in open foothill woodland. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible From the Vaca Range to the Napa River Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Kenwood Marsh checkerbloom *Sidalcea oregana* subsp. *valida*	FE SE 1B.1	Occurs in freshwater marshes and swamps. Known only from Sonoma County from three small occurrences at Knights Valley and Kenwood Marsh between 115 and150 meters.	June-September rhizomatous herb	Suitable vegetation associations are present; however, this taxon is highly limited in distribution. The nearest recorded CNDDB occurrence is 10 miles north in Kenwood Marsh. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
green jewel-flower *Streptanthus hesperidis*	1B.2	Occurs in chaparral openings and cismontane woodland on serpentinitic and rocky sites. Known from Lake and Napa counties between 130 and 760 meters.	May-July annual herb	Suitable vegetation associations are present but serpentine substrates are absent within the project area. This species is also considered out of range within the project area. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Mount Tamalpais bristly jewel-flower *Streptanthus glandulosus* subsp. *pulchellus*	1B.2	Occurs on serpentine sites in chaparral and valley and foothill grassland. Known only from the Mt. Tamalpais area in Marin County between 150 and 800 meters	May-August annual herb	Suitable habitat is present; however, the preferred substrate serpentine is absent within the project area. The project is outside of the known species range.	None
slender-leaved pondweed *Stuckenia filiformis*	2.2	Occurs in assorted shallow freshwater marshes and swamps between 300 and 2,150 meters.	May-July rhizomatous herb (aquatic)	Suitable habitat and hydrologic conditions present within the appropriate elevational range. The nearest CNDDB occurrence is located 5 miles southeast at City Pond at Fairfield City Hall. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Within suitable habitat of appropriate elevational range Not observed during focused botanical surveys conducted in 2010 and 2011

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
Suisun marsh aster *Symphyotrichum lentum*	1B.2	Occurs in brackish and freshwater marshes and swamps between 0 and 3 meters.	May-November rhizomatous herb	Suitable vegetation associations and hydrologic conditions are present within the portion of the project area that crosses Napa River. May occur within Napa River vicinity between towers 110 and 118. Nearest CNDDB occurrence is 1.2 miles north of the project area in Kennedy Park near the Napa River. Two other occurrences are within 2.5 miles south in Fagan Marsh, on the Napa River. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Not observed during focused botanical surveys conducted in 2010 and 2011.
Napa bluecurls *Trichostema ruygtii*	1B.2	Occurs in chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, and vernal pools. Known from Napa and Solano counties from 30 to 680 meters.	June-October annual herb	Suitable habitat and hydrologic conditions are present from Gordon Valley to the Napa River between towers 68 and 104. The nearest CNDDB occurrence is located 0.6 mile north at Green Valley Ranch. There are three additional CNDDB occurrences that are within 4 miles of the project area. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible Not observed during focused botanical surveys conducted in 2010 and 2011.
two-fork clover *Trifolium amoenum*	FE 1B.1	Occurs in coastal bluff scrub and valley and foothill grassland that can be serpentinitic. Rediscovered in 1993. Currently only known from Marin County. Presumed extirpated from Napa, Solano, and Sonoma counties. Has been recorded from 5 to 415 meters.	April-June annual herb	Suitable vegetation associations are present but preferred serpentine substrates are absent. There are five CNDDB occurrences within 5 miles of the project area but all are non-specific locations based on historic collections. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
saline clover *Trifolium hydrophilum*	1B.2	Occurs on mesic and alkaline sites in marshes and swamps and valley and foothill grassland and vernal pools between 0 and 300 meters.	April-June annual herb	Suitable vegetation associations, hydraulic conditions, and preferred substrate are present in the vicinity of Sacramento Valley, Napa River, and Sonoma Valley in the project area. Nearest CNDDB occurrence is 0.1 miles north of the study site just east of the Napa River. The occurrence is presumed extirpated by development of a business park. Not observed during focused botanical surveys conducted in 2010 and 2011	Possible
coastal triquetrella *Triquetrella californica*	1B.2	Occurs on soil in coastal bluff scrub and coastal scrub. Known from fewer than ten small coastal occurrences in from between 10 and 1,000 meters.	Moss	Marginally suitable habitat is present in coyote brush scrub on site. The project area is too far inland for this species and therefore considered out of range. The nearest recorded CNDDB occurrence is 14 miles north near Spring Lake in Sonoma County. Not observed during focused botanical surveys conducted in 2010 and 2011.	Not Expected Not observed during focused botanical surveys conducted in 2010 and 2011.
Crampton's Tuctoria *Tuctoria mucronata*	FE SE 1B.1	Occurs in mesic valley and foothill grassland and vernal pools. Known from Solano and Yolo counties from 5-10 meters. Known from only three occurrences, one of which is presumed to be extirpated.	April-August annual herb	Suitable vegetation associations are present in the Sacramento Valley between towers 3 and 10.The two nearest CNDDB occurrences are located approximately 10.5 miles near Jepson Prairie and one is presumed extirpated. Not observed during focused botanical surveys conducted in 2010 and 2011.	Possible in the Sacramento Valley Not observed during focused botanical surveys conducted in 2010 and 2011.

Species Name	Listing Status[1]	Life History	Blooming Period/ Life Form	Habitat Suitability	Potential to Occur[2]
oval-leaved viburnum *Viburnum ellipticum*	2.3	Occurs on chaparral, cismontane woodland, and lower montane coniferous forest between 215 and 1,400 meters.	May-June shrub (deciduous)	Present in the project area in the Vaca Mountains of Napa County between towers 56 and 57 on private land. Observed in a May 2011 survey at the bottom of a steep canyon straddling an ephemeral drainage. Population comprises one colony of 11 individuals. Suitable vegetation associations present in the project area. Nearest CNDDB occurrence is 0.7 miles north of the project area. There are two other occurrences within 5 miles.	Present In the Vaca Mountains of Napa County

Notes:

[1] Definitions of Listing Status codes:

- **FE**: Listed as endangered under the federal Endangered Species Act
- **FT**: Listed as threatened under the federal Endangered Species Act
- **SE**: Listed as endangered under the California Endangered Species Act
- **ST**: Listed as threatened under the California Endangered Species Act
- **SC**: Candidate for listing under the California Endangered Species Act
- **SR**: Listed as rare under the California Native Plant Protection Act.
- **1A**: Presumed extirpated in California and rare or extinct elsewhere
- **1B.1**: Rare, threatened, or endangered in California and elsewhere; seriously endangered in California
- **1B.2**: Rare, threatened, or endangered in California and elsewhere; fairly endangered in California
- **1B.3**: Rare, threatened, or endangered in California and elsewhere; not very endangered in California
- **2.1**: Endangered in California, but more common elsewhere
- **2.2**: Threatened in California, but more common elsewhere
- **2.3**: Rare in California; but more common elsewhere

[2] Definitions of Classification for Occurrence Potential:

- **None**: denotes a complete lack of habitat suitability, local range restrictions, and/or regional extirpations.
- **Not Expected**: denotes situations where suitable habitat or key habitat elements may be present, but may be of poor quality or isolated from the nearest extant occurrences. Incompatible habitat suitability refers to elevation, soil chemistry and type, vegetation communities, microhabitats, and degraded/significantly altered habitats. These factors create unsuitable ecological conditions for the consideration of even a low occurrence potential within the project area.
- **Not Observed**: refers to plant species that were considered to have a potential to occur within the project area but were not observed during the course of the botanical surveys. This designation is primarily used for annual plant species that may not be present every year.
- **Absent**: indicates specified taxa not observed during field investigations and were consequently ruled out. This category refers to diagnostic vegetative material of shrubby perennial species not observed on site.
- **Possible**: indicates the presence of suitable habitat or key habitat elements that potentially support a specific species or taxa.
- **Present**: indicates the target species was observed directly during field investigations.

[2] Holly-leaved ceanothus was observed during the botanical surveys occurring immediately adjacent to the project area; however, this species was not observed within the project area.

Source: PG&E 2012

ATTACHMENT H:
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Special-Status Wildlife with Potential to Occur in the Project Area

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
Invertebrates			
California freshwater shrimp *Syncaris pacifica*	FE SE	Low gradient perennial streams with moderate to heavy riparian cover	CNDDB record in existing project alignment at Huichica Creek between Towers 132 and 133. May occur in other streams with riparian zones in Sonoma County. Assumed Present
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	A variety of seasonal pools including stone, mud, and grassy bottomed habitats	Habitat is present in limited areas and CNDDB records exist in the project area in vernal pools in the vicinity of Towers 3 to 10, near Vaca Substation, and within the Remy Preserve. Assumed Present
Conservancy fairy shrimp *Branchinecta Conservation*	FE	Vernal pools, swales, usually in grassland habitats	Vernal pools exist in the vicinity of Towers 3 to 10 within the Remy Preserve. Regular sampling of this preserve has never identified this species. Low Potential
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	A variety of ephemeral wetland habitats	Vernal pools exist in the vicinity of Towers 3 to 10 within the Remy Preserve. This species has never identified with this preserve. Low Potential

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
Callippe silverspot *Speyeria callippe callippe*	FT	Grasslands with sufficient *Viola* host plants, adequate nectar sources and hilltops for mating	The host plant *Viola pedunculata* was identified in several locations. Focused surveys in areas supporting host plant populations noted no evidence of adult or larval butterflies, indicating it is likely absent from the project area. Low Potential
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Requires elderberry host plant having stems of 1-inch in diameter or greater at ground level	Species range extends into Solano and Napa counties. Several known occurrences of the species exist in the project area. Elderberry shrubs were identified in the vicinity of Towers 40, 41, 42, and 65. Evidence of presence was noted in some locations. Assumed Present
Fish			
Green sturgeon *Acipenser medirostris*	FT SSC	Occurs in the Sacramento River and associated estuaries, including the Napa River	Known to occur in the tidal portions of the Napa River. May occur in project area where the existing transmission line crosses the Napa River. Moderate Potential
Delta smelt *Hypomesus transpacificus*	FT SE	Inhabits the Sacramento-San Joaquin Delta and occurs seasonally in San Pablo Bay, Suisun Bay and Carquinez Strait	Known to occur in the Napa River. May occur in project area where the existing transmission line crosses the Napa River. Assumed Present
Sacramento splittail *Pogonichthys macrolepidotus*	SSC	Inhabits slow moving freshwater or moderately saline rivers and sloughs	Known to occur in the Napa River. May occur in project area where the existing transmission line crosses the Napa River. Assumed Present
Steelhead – central California coast and Central Valley DPS *Oncorhynchus mykiss irideus*	FT	Requires perennial streams with clear, cool, fast moving water with abundant riffles and gravel	Green Valley Creek (Tower 84) and Suisun Creek (Tower 73). Also may occur periodically in Ulatis Creek (Tower 33), Alamo Creek (Tower 37), and Ledgewood Creek (Tower 64). High Potential

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
Chinook Salmon, Central Valley Spring Run *Oncorhynchus tshawytscha* and Sacramento Winter Run *Oncorhynchus tshawytscha*	FT ST	Requires shallow stream reaches with gravel and cobble substrates for spawning	May occur in Green Valley Creek east of Tower 85. Moderate Potential
Amphibians			
Foothill yellow-legged frog *Rana boylii*	SSC	Inhabits streams with rocky substrates; attaches eggs to cobbles	May occur in Ulatis Creek (between 33 and 36) and Alamo Creek (between 37 and 38). CNNDB record in the project area just west of Lakeville Substation in Adobe Creek, a seasonal creek with restored riparian habitat (1997). Moderate Potential
California red-legged frog *Rana draytonii*	FT SSC	Permanent and semipermanent still or slow moving aquatic habitat for breeding, normally with emergent and submerged vegetation; during the nonbreeding season, individuals may be found in cool, moist habitats, including burrows	May occur in portions of the project area. Most likely to occur from Alamo Creek to east of Napa River, from west of Napa River to approximately 137, and from approximately Sonoma Creek (157) to Lakeville substation. CNDDB records in the project area include two records at/near the Sonoma Transfer Station near the Petaluma River (2002) and along Champlin Creek (2004) –County Dump Road, leading to the landing zone south of Tower 172. High Potential

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
California tiger salamander *Ambystoma californiense*	FE SE (Sonoma DPS) FT ST (Central California DPS)	Breeds in seasonal pools, requires upland refuge containing rodent burrows for refuges	Historically may have occurred in the far eastern portion of the project area within suitable habitat in Solano County. No extant populations are known to exist within 7 miles of the project. Several previous studies near the project area have failed to find the species. High quality habitat is absent from the project area. Sonoma/Napa: No Potential Solano: Not Expected to Occur
Reptiles			
Western pond turtle *Emys marmorata*	SSC	Inhabits permanent water with adequate depth and basking sites. Use surrounding uplands for egg deposition	Aquatic habitat in agricultural ponds near Towers 62, 119, 128, and 143. Also may occur in Suisun Valley Creek near Tower 73, in Suscol Creek and the Horseshoe Bend portion of the Napa River. Nesting habitat in areas with suitable soil and vegetation within about 0.25 miles of aquatic habitat. High Potential
Giant garter snake *Thamnophis gigas*	FT ST	Requires sufficient water during the active season (May 1 to October 1) to support a prey base, emergent vegetation for cover, and upland refuges and hibernacula	The eastern terminus of the project near Vaca Substation and Towers 1 and 2 are within the historic range of the species. No suitable habitat is present near the project and no known populations existing within 10 miles of the project. No Potential
Birds			
Northern harrier *Circus cyaneus*	SSC	Nests adjacent to wetlands, croplands, grasslands, and other open habitats	May nest in habitats throughout the project area, especially along the Napa River. Assumed Present

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
Golden eagle *Aquila chrysaetos*	FP	Nests on cliffs and on trees in open areas. Hunts in open areas	Nesting habitat is present in the project area in open grasslands with suitable nesting trees, along cliffs, and in oak woodlands. Historic nest sites are known in the surrounding area. Multiple pair territories identified. Assumed Present
Bald eagle *Haliaeetus leucocephalus*	SE	Nests in large trees near rivers and coasts and in cliffs. Hunts in open areas	Nesting habitat is present in the project area in open grasslands with suitable nesting trees, along cliffs, and in oak woodlands. Historic nest sites are known in the surrounding area. Assumed Present
Swainson's hawk *Buteo swainsoni*	ST	Nest in a variety of tree species, forage over open areas. In Central Valley feed on ground squirrels, voles, insects, crayfish	Nesting habitat is present in the eastern portion of the project area, with 8 documented CNDDB occurrences within one mile of the existing alignment near Vaca Substation. Known nest sites exist greater than 0.5 mile from the project area in the Vacaville and Napa River areas. Assumed Present
American peregrine falcon *Falco peregrines anatum*	FP	Typically nest on high cliffs or human structures. Feed almost exclusively on other birds	Nesting habitat may be present in the Vaca Range within the existing alignment area north of Green Valley. Foraging habitat may occur throughout the project area. Low Potential
White-tailed kite *Elanus leucurus*	FP	Inhabits grasslands, croplands, marshes, and other sparsely-wooded areas. Primarily feed on mice and voles	May occur in lower elevation, relatively flat habitats throughout the project area. Assumed Present
Northern spotted owl *Strix occidentalis caurina*	FT	Breeds and roosts in forests and woodlands with mature trees and snags, dense complex canopies, and downed woody debris	Known records exist in the Vaca Mountains and Sonoma Mountains; however, no records exist within 1 mile. Low quality nesting habitat exists in portions of the Vaca Mountains. Low Potential

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
Western burrowing owl *Athene cunicularia*	SSC	Require open areas with short, sparse vegetation and underground burrows	Suitable habitat exists within lowland portions of the project near Vacaville and Fairfield. Breeding season surveys in 2012 failed to identify active burrows. Wintering owl surveys in 2013 identified two owls near Vacaville Substation. Assumed Present
California black rail *Laterallus jamaicensis coturniculus*	ST FP	Tidal marshes with abundant pickleweed, and brackish or freshwater marshes at low elevations	Known to occur along the Napa River south of the project. A habitat assessment conducted in 2013 found no suitable breeding or refuge habitat present within 700 feet of the project. Low Potential
California clapper rail *Rallus longirostris obsoletus*	FE SE FP	Salt marshes and tidal sloughs characterized by heavy growth of pickleweed	Known to occur along the Napa River south of the project. A habitat assessment conducted in 2013 found no suitable breeding or refuge habitat present within 700 feet of the project. Low Potential
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	SSC	Freshwater, salt, and brackish marshes with tall grasses, emergent vegetation and willows for nesting substrate and cover	Marshes associated with Napa River and Suscol Creek near Towers 111 through 115 provide suitable habitat. Observed along the Napa River in 2013. Assumed Present
San Pablo song sparrow *Melospiza melodia samuelis*	SSC	Tidal sloughs with tall bushes along edges for cover and nesting	Observed in 2013 in marshes in the vicinity of Towers 112 through 115 along the Napa River. Assumed Present
Tricolored blackbird *Agelaius tricolor*	SSC	Requires large growths of dense marsh vegetation protected from predators; colonial nesters	Potential habitat for nesting exists in marshes associated with the Napa River and Suscol Creek near Towers 111 through 115. CNDDB records have been recorded along the east side of the Napa River. High Potential

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
Yellow-breasted chat *Icteria virens*	SSC	Nests and forages in dense riparian vegetation bordering streams, creeks, and rivers	Potential habitat exists in riparian zones associated with creeks in Sonoma County and in the Napa River area. Moderate Potential
Mammals			
Pallid bat *Antrozous pallidus*	SSC	Roosts and forages in a variety of habitats including oak woodland, grassland, and scrub	A documented roost site is present in a structure near Tower 123 at Saintsbury Winery with up to 100 bats observed in 1997 and 7 bats observed in 2007. Many potential roost sites including trees and human structures exist in and around Saintsbury Winery in Carneros Valley and along Huichica Creek. Assumed Present
Townsend's big-eared bat *Corynorhinus townsendii*	SSC	Roosts in caves, mines, and abandoned human structures	No high quality habitat identified. May use rock crevices or hollow trees within project area. Low Potential
Western red bat *Lasiurus blossevillii*	SSC	Roosts in foliage, usually on the underside of hanging leaves; often forages over forested or riparian areas	May occur throughout the project area within riparian corridors and dense foliage. Moderate Potential
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE SE FP	Salt marshes with dense cover of pickleweed with an adjacent upland refuge from flood waters	The marshes in the vicinity of Towers 112 through 115 contain potential habitat. Known occurrences exist immediately south of the project within marshes along the Napa River. Moderate Potential

Species Name	Listing Status[1]	Habitat	Potential to Occur[2]
American badger *Taxidea taxus*	SSC	Inhabits a variety of habitat types including scrub, forest, and grasslands; requires friable soils for burrowing and an adequate rodent prey base	May occur in grasslands and woodlands in project area throughout the project area. One historic CNDDB occurrence exists between Towers 115 and 122. Moderate Potential

Notes:

[1] Explanation of state and federal listing codes:

Federal listing codes:
-**FE**: Federally Endangered Species
-**FT**: Federally Threatened Species

California listing codes:
-**CE**: State-listed as endangered
-**CT**: State-listed as threatened
-**FP**: Fully Protected Species
-**SSC**: Species of Special Concern

[2] Explanation of Potential to Occur classifications:

- **Assumed Present:** The species was observed or is known to be present, based on substantial evidence in the project area during field surveys.
- **High Potential:** CNDDB occurrences have been recorded within 0.75 mile of the project and suitable habitat is present. Individuals were not observed during field surveys; however, the species may be present or otherwise impacted by the project.
- **Moderate Potential:** CNDDB occurrences have been recorded within 5 miles of the project area and suitable habitat is present. Individuals were not observed during field surveys; however, the species may be present or otherwise impacted by the project.
- **Low Potential:** Suitable or marginal habitat may occur in the project area, but no CNDDB records of the species have been recorded within the last 50 years, records of the species within 5 miles of the project are suspected to be extirpated or described as potentially misidentified with other species, or individuals were not observed during field surveys and are not anticipated to be present.
- **No Potential:** The project area is not located within the range of the species; suitable habitat does not exist in the project area; the species is restricted to a specific area outside of the project area; previous CNDDB occurrences of the species in the project area may have been misidentified or are known to be extirpated; no CNDDB records exist of the species within the last 50 years; and/or protocol-level surveys have failed to identify the species.

Source: PG&E 2011

ATTACHMENT I:
VERNAL POOL HYDROLOGICAL IMPACT ASSESSMENT MEMORANDUM

VERNAL POOL HYDROLOGIC IMPACT ASSESSMENT

Vaca Dixon-Lakeville 230 kV Reconductoring Project
Solano County, California
Pacific Gas and Electric Company

April 1, 2014

INTRODUCTION

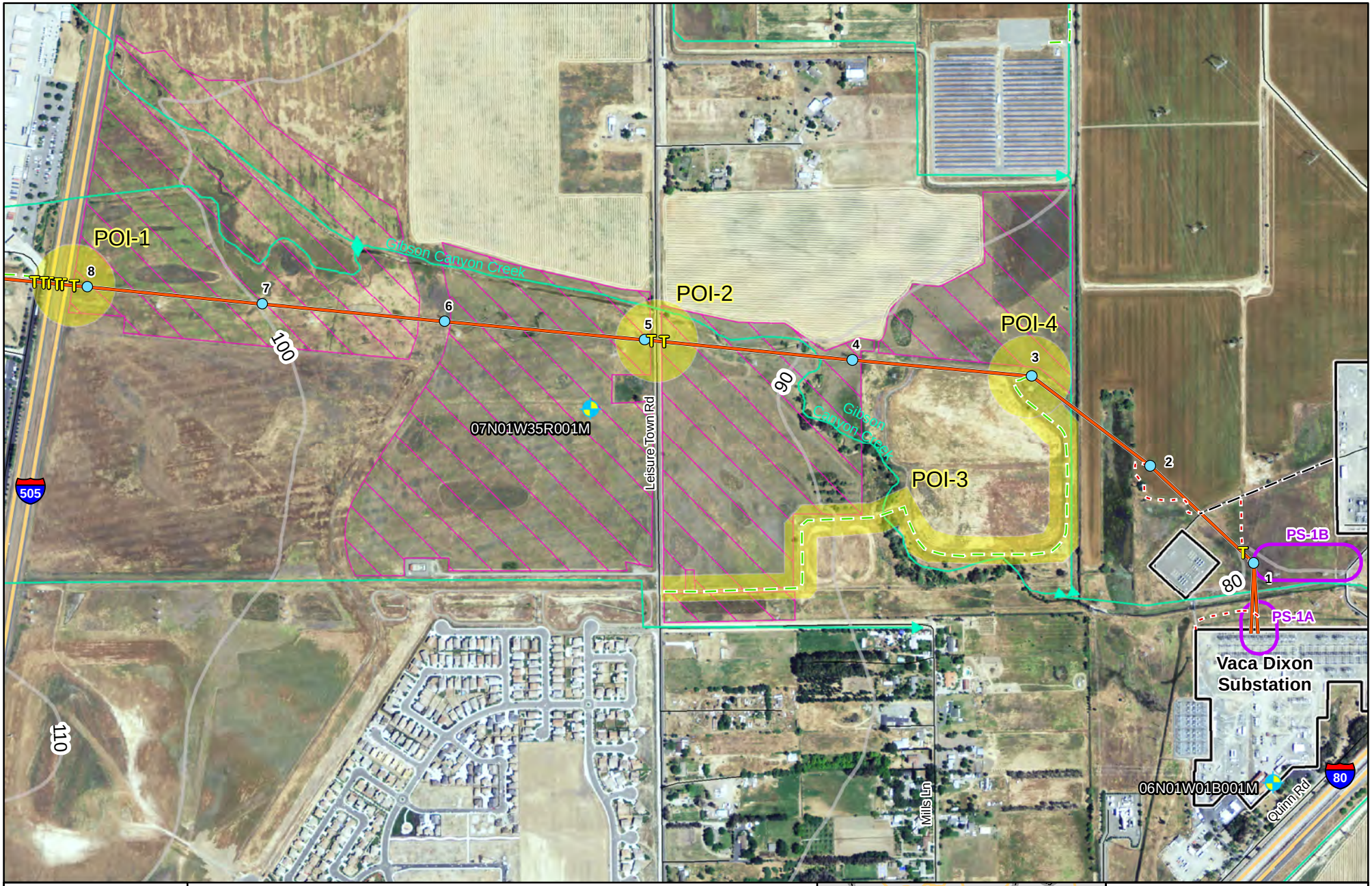
As part of the Vaca Dixon-Lakeville 230 Kilovolt (kV) Reconductoring Project (project), Pacific Gas and Electric Company (PG&E) will be required to perform limited construction-related activities, such as install temporary guard structures and access and use a tower work area adjacent to the Michael Remy Preserve (Preserve). The Preserve, which is located on two parcels in the cities of Vacaville and Dixon in Solano County, California, is a conservation easement managed by the Center for Natural Lands Management. Approximately 100 acres of vernal pool and wetland complexes are located within the approximately 540-acre Preserve and these features provide suitable habitat for sensitive vernal pool species, such as vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardi*).

This memorandum has been prepared to determine the project's potential hydrologic impacts on vernal pool and other wetland features, as well as sensitive vernal pool species within the Preserve. This memorandum also presents avoidance measures to be implemented during project construction.

PROJECT LOCATION

The existing Vaca Dixon-Lakeville transmission line traverses Solano, Napa, and Sonoma counties, primarily spanning rural residential and agricultural areas. Beginning at Vaca Dixon Substation in the City of Vacaville (located just west of the intersection of North Meridian Road and Interstate 80), the existing transmission line corridor travels approximately 4.1 miles west to approximately Gibson Canyon Road north of Vacaville and then travels approximately 19.1 miles southwest to Tulucay Substation (located near the intersection of Highway 221 and Anderson Way) south of Napa. From Tulucay Substation, it travels approximately 16.9 miles west to Lakeville Substation (adjacent to the intersection of Old Adobe Road and Frates Road) near the City of Petaluma.

The Preserve is located approximately 0.15 mile west of Vaca Dixon Substation near the eastern terminus of the project. Figure 1: Overview Map shows the project features and work areas, including guard structure locations, existing towers, and proposed access routes, located near the Preserve.



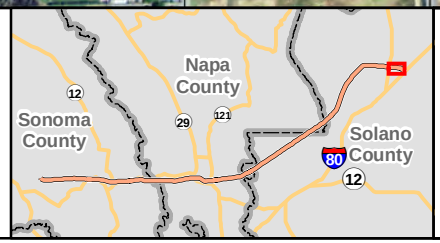
Feet
0 200 400 800
1 inch = 800 feet
1:9,600

Pacific Gas and Electric Company
AECOM

- Steel Lattice Tower
- Guard Structure
- Vaca Dixon-Lakeville 230 kV Transmission Line
- Pull Site
- Substation
- Groundwater Well/Level Recorder
- Stream Flowline
- Topographic Contour
- Study Area
- Michael Remy Preserve

Project Access
- Existing Paved Road
- Existing Unpaved Road
- Overland Route

** = Locations are approximate and may be modified based on final design.



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Figure 1: Overview Map
September 2013

DESCRIPTION OF ACTIVITIES

The work associated with the following two construction activities were evaluated for potential hydrologic impacts to resources within the Preserve due to the potential ground-disturbing nature and/or location of the activities (within 250 feet of vernal pool features within the Preserve):

- **Guard Structure Installation.** As a standard practice, public roadways, over which the existing line crosses, require protection to ensure public safety in the unlikely event that the transmission line is dropped during reconductoring activities. In the vicinity of the Preserve, guard structures will be installed across two roadways—Interstate 505 (I-505) and Leisure Town Road. Depending on the width of the crossing and other site-specific conditions, roadways may be guarded using one of the following methods:
  - **H-Frame Guard Structure Installation.** This method involves the installation of temporary wood poles with an "H-frame" configuration and is generally used for larger road crossings, such as I-505. The structures consist of two poles installed on either side of the road crossing that support netting suspended above the roadway below the transmission lines. Temporary wood poles are installed by first auguring holes and placing poles in the holes using line trucks or cranes. The remaining void is then backfilled and the surrounding area is compacted. Wood poles are direct buried (with no foundations or footings) and guy wires may be attached and installed for stability. Once construction is complete, the wood poles are removed. Installation of each H-frame guard structure requires a temporary work area of approximately 0.1 acre to accommodate installation.
  - **Line Truck Staging.** This type of guard method involves staging one to two line or bucket trucks along the road shoulder and using the boom as the protective catchment feature. Because no pole installation is required for this type of guard method, no ground disturbance is required and the work area reflects the footprint of the truck used (no more than 0.02 acre). This method may be used for narrower road crossings, such as Leisure Town Road.
  - **"Flower Pot" Structure Staging.** This type of guard method involves the use of erect wood poles in which the base of the pole is suspended in a concrete block. These structures may be placed directly on the ground on the sides of the roadway and do not require any ground disturbance. The work area consists of the footprint of the concrete block used (no more than 0.02 acre). Similar to line truck staging, this method may be used for narrower road crossings, such as Leisure Town Road.
- **Tower 3 Modifications.** Overhead electrical hardware and equipment will be modified on Tower 3, which is an existing tower located adjacent to the northeastern boundary of the Preserve. Work activities will require the staging of construction equipment on the

ground at the base of the tower. A total work area of up to approximately 1 acre surrounding the tower will be used.

- **Construction Vehicle Access.** Limited use of overland travel routes and unpaved access roads near or adjacent to the Preserve will be required during construction. To access the Tower 3 work area from Leisure Town Road, an existing unpaved access road, located immediately adjacent to the Preserve, will be utilized.

The locations of these activities and access roads are shown in Figure 1: Overview Map. Additional activities—including reconductoring the existing overhead 230 kV transmission line and modifying four towers (Towers 4 through 8)—will occur within and/or adjacent to the Preserve; however, these activities will be conducted by helicopter and no ground disturbance or use of ground-based vehicles are required. As a result, these activities are not further evaluated as part of this memorandum.

METHODOLOGY

Background Data and Literature Review

To initiate the assessment, AECOM reviewed pertinent background data and literature, including:

- local topographic information from the U.S. Geological Survey (USGS)[1];
- soils information from the National Resource Conservation Service's Soil Survey Geographic Database (SSURGO);
- groundwater information from the California Department of Water Resources (CADWR); and
- local site information from other municipal reports.

Field Reconnaissance

To further evaluate potential impacts on wetland features and vernal pool species in the Preserve, an AECOM Water Resources Engineer (Michael Mak) and an AECOM Wetland Ecologist (Shannon Hickey) conducted a field reconnaissance on July 10, 2013. Based on site conditions and the nature of the proposed work activities, the field assessment focused on the following four points of interest (POIs) to evaluate potential hydrologic impacts on the adjacent Preserve:

POI-1. The Preserve areas adjacent to I-505 northbound lanes, below the transmission line, where guard structures are proposed (west of Tower 8).

[1] The topography in the project area was reviewed by retrieving the USGS National Elevation Dataset for the site as a 1/9 arc second (approximately 3-meter resolution) digital elevation model. Contours at 10-foot intervals were also retrieved from the USGS National Map Viewer (USGS 2013).

POI-2. The Preserve areas adjacent to Leisure Town Road, below the transmission line, where guard structures are proposed (east of Tower 5).

POI-3. The approximately 4,200-foot-long unpaved access road from Leisure Town Road to the Tower 3 work area, portions of which are located immediately adjacent to the Preserve.

POI-4. The Preserve areas adjacent to the Tower 3 work area immediately northeast of the Preserve's boundaries.

Figure 1: Overview Map shows the four POIs evaluated during the field reconnaissance.

AVOIDANCE MEASURES

The following measures and best management practices will be implemented as part of the project. These measures have been adapted from the measures included in the project's Initial Study/Mitigated Negative Declaration (IS/MND) and Biological Assessment.

1. **Erosion and Sediment Control.** In accordance with the SWPPP, best management practices (BMPs) will be implemented to reduce the potential for erosion and sedimentation during construction. These BMPs may include, but are not limited to, the installation of erosion control fencing or straw wattles, covering soil piles, protecting storm drain inlets from runoff, and/or controlling vehicle track-out from the temporary construction areas. (PG&E 2014)

2. **Ground-Disturbance Minimization.** Ground-disturbing activities, such as grading, blading, and cut and fill activities will be minimized to the greatest extent feasible. (IS/MND Measure APM HYDRO-2).

    - Use non-ground-disturbing alternatives (e.g., line trucks, wood poles supported by aboveground "flower pots", etc.) as guard structures at the Leisure Town Road crossing.

3. **Dust Suppression.** Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered or covered, as needed, to reduce fugitive dust. (IS/MND APM AQ-2)

4. **Vehicle Speed Limits.** Project-related vehicles will observe a 15-mile-per-hour speed limit on all project access roads/routes and within work areas, pull sites, helicopter landing zones, and construction yards, except on city and county roads and state and federal highways, where the posted maximum speed limit will be observed. (PG&E 2014)

5. **Construction Site Cleanup.** Following construction, all trash and construction debris from project sites will be removed. (PG&E 2014)

6. **Seasonal Work Restrictions**: Major construction activities within and adjacent to the Preserve shall be conducted during the dry season (defined as April 15 to October 31). (PG&E 2014)

EXISTING CONDITIONS

Regional

The Preserve contains naturally occurring vernal pools and wetland complexes that comingle with compensatory-constructed wetlands for mitigation of the North Village development, which is located south of the project site (USFWS 2004). Figure 1: Overview Map shows the vernal pool and wetland locations within the Preserve. The Preserve is primarily dominated by non-native annual grasses and forbs. The vernal pool complexes in the project area are classified as Northern Hardpan vernal pools (Vacaville 2010), which occupy shallow depressions on deep alluvial soils in the Solano-Colusa Vernal Pool Region (CDFG 2010). Northern Hardpan vernal pools are typically smaller and experience shorter inundation and moisture periods than the Northern Claypan vernal pools that dominate the region.

During the winter rainfall season, rainfall/runoff perches on the hardpan layer, resulting in shallow pools in the localized depressions. As temperatures in the spring increase and storm events become increasingly less frequent, the pools evaporate and a gradient of vegetation encroaches as the pools dry. The vernal pools have little to no interaction with the groundwater levels in the project area due to the presence of the hardpan layer.

The Solano Multi-Species Habitat Conservation Plan (Solano HCP), which was developed in 2009, established a framework for aligning current infrastructure activities and future development with state and federal endangered species regulations. Within this countywide framework, biological resource conservation areas were delineated and classified as low, medium, or high value. The Northern Hardpan vernal pools in the project area were classified as medium value, which is defined as highly to very highly disturbed lands located on historic vernal pool soils (SCWA 2009).

According to the Solano HCP, this area has been previously leveled and/or cultivated, which has altered the native soil profile. However, the underlying impermeable layers remain intact, which allows for the periodic saturation of the areas within the Preserve. Observations from the field reconnaissance indicated that the majority of the lands adjacent to the Preserve have already been altered either from previous plowing/disking activities or road construction.

Points of Interest (POIs)

A review of the existing data and literature for the POIs yielded the following topographic, soil, and hydrologic information:

- **Topography.** Based on review of the USGS National Elevation Dataset and USGS National Map Viewer, the general ground surface slope at the POIs is estimated to be 0.003 foot/foot from west to east (USGS 2013).
- **Soils.** The SSURGO soils database and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey for the project area shows that the soils at the POIs are primarily composed of San Ysidro (SeA) and San

Ysidro (SfA), sandy loams with normal and thick surfaces (USDA NRCS 1997 and 2013). Other soils include Capay silty clay loam (Ca), Clear Lake clays (CeA), and Yolo loam, clay substratum (Yr). The parent material is Alluvium derived from sedimentary rock which is alkaline with a low to moderately low saturated hydraulic conductivity. The hydrologic soil group for the San Ysidro soils is D, which translates to high runoff potential when thoroughly wet and restricted to very restricted water movement through the soil layer. The San Ysidro groups are characterized by a clay loam profile from 14 to 28 inches below the surface. The depth to water table in these soils is cited to be more than 80 inches below the ground surface (USDA NRCS 2013).

- **Streams.** The existing transmission line crosses Gibson Canyon Creek, which flows from west to east into Sweany Creek further downstream, at multiple locations. Along the eastern project boundary, the transmission line crosses over an unnamed flowpath that drains into Gibson Canyon Creek. The corridor also crosses an unnamed tributary to Gibson Canyon Creek just outside of the project area, west of I-505. Figure 1: Overview Map provides a detailed view of flowpaths along and adjacent to the transmission line based on information from the USGS National Hydrography Database (USGS 2013).
- **Groundwater.** A shallow aquifer that underlies the Preserve, POIs, and the surrounding northeastern region of Solano County provides the primary groundwater supply for agricultural and local uses. This groundwater basin extends from the Vacaville foothills west of the site towards the Sacramento River, and from Putah Creek north of the site to Fairfield. The Tehama Formation aquifer is located over 1,000 feet below Vacaville. The groundwater supply for Vacaville is drawn from this deep aquifer. Local groundwater information for the site was retrieved from the California Department of Water Resources (CADWR) Water Data Library (CADWR 2013). As shown in Figure 1: Overview Map one groundwater well/level recorder (#07N01W35R001M) is located within the Preserve. Groundwater levels were recorded biannually from 1931 to 1994, with one reading in the fall and spring seasons. From 1960 through 1970, a significant increase in recorded groundwater levels occurred, which may have been a result of changes in agricultural practices in the area. The average depth to groundwater at this location is 11.28 feet (1970–1994).

HYDROLOGIC IMPACT ASSESSMENT RESULTS

To determine whether vernal pool or other wetland features within the Preserve had the potential to be affected by construction activities, two types of hydrologic impacts—direct and indirect—were assessed. A direct impact was defined as *any activity that could directly alter vernal pool or wetland features, such as soil disturbance or discharge of soils within or near the feature; increased potential for sedimentation, erosion, or turbidity; or modifications to water chemistry (pH, etc.)*. An indirect impact was defined as *any activity that could alter the condition, regime, and/or connectivity of hydrologic features in the area*. It was assumed that both types of impacts had the potential to alter the conditions of the vernal pools in a manner that could render them unsuitable habitat for vernal pool species, including vernal pool fairy shrimp (*Branchinecta lynchi*), which is known to inhabit the complex (PG&E 2014). Therefore,

potential direct or indirect impacts to the vernal pool features were assumed to result in potential direct or indirect impacts to any vernal pool species (if present), respectively. Direct and indirect impact results are presented by POI in the following sections.

POI-1: I-505 (near Tower 8)

As shown in Figure 1: Overview Map, the western boundary of the Preserve runs along the east side of I-505 and a perimeter fence is present between the roadway and the Preserve. Due to the nature and width of the I-505 crossing, a total of four H-frame guard structures (each comprised of two wood poles) will be installed immediately adjacent to the highway, including one structure just east of the northbound lane, two structures in the median (between the northbound and southbound lanes), and one structure just west of the southbound lane.

One H-frame guard structure located on the east side of the I-505 northbound lane and approximately 200 feet west of a vernal pool feature was considered to have the potential to impact vernal pool features and potential habitat for vernal pool species within the Preserve. The guard structure, which will require three approximately 24-inch-diameter wood poles to be embedded approximately 6 to 7 feet below ground, will be installed approximately 25 to 50 feet east of I-505, directly under the existing transmission line. Three steel screw anchors would also need to be installed approximately 10 feet from the poles. Construction vehicles and crewmembers are anticipated to access to the guard structure work area from I-505 by traveling overland for approximately 25 to 50 feet.

As shown in Photographs POI-1.1 and POI-1.2 in Attachment A: Representative Photographs, this particular proposed guard structure location consists of a well-vegetated slope with an estimated grade of 50 percent that is dominated by non-native annual grasses. The slope continues into a shallow depression along the perimeter fence within the Preserve. Plowing or disking activities in the area have created some intermittently saturated areas that appear to be hydrologically connected to the roadway runoff and direct precipitation; however, these areas lack a distinct basin or swale and would not remain saturated long enough to support vernal pool species such as vernal pool fairy shrimp.

Installation of the wood poles along the east side of I-505 will result in limited soil disturbance within the guard structure work area. Although no vernal pools are located within the proposed work area, ground disturbance associated with installation of these two poles may increase the potential for erosion and stormwater runoff to transport sediment into vernal pool features in the vicinity, which can result in the potential for impacts to vernal pool species. However, based on a review of site conditions, any sediment transport caused by runoff would be minimal because of the presence of well-established dense vegetation on the slope. The vegetated areas disturbed by activities are dominated by medusa head (*Elymus caput-medusae*), wild oats (*Avena* sp.), and soft chess (*Bromus hordeaceus*), and are anticipated to return to their existing conditions after construction is complete. In addition, to further ensure that any impacts are avoided, site-appropriate avoidance measures would be implemented as necessary, including erosion control devices such as straw wattles, between the guard structure

work area east of I-505 and the Preserve, in order to prevent any runoff and sediment transport from the work area to surrounding areas. Because the work will be conducted in the dry season, the risk of site run-off will be very low. Ground disturbing activities will be minimized to avoid site disturbance, and approved project measures will be implemented to ensure that direct and indirect impacts to vernal pools and vernal pool species are avoided.

Although minimal ground disturbance will be required to install the poles approximately 6 to 7 feet below ground, these activities will not result in the alteration of any existing hydrologic connections or impacts to the hydrologic regime. Ground disturbance will be limited to the auguring of holes and no grading or recontouring is proposed. The estimated depth to groundwater at the site is approximately 11.28 feet, which is approximately 4 to 5 feet below the influence of these structures. As a result, no impacts to vernal pools or vernal pool species are anticipated.

POI-2: Leisure Town Road (near Tower 5)

As shown in Figure 1: Overview Map, Leisure Town Road bisects the Preserve. Two wetland features—one vernal pool and one mitigation wetland—are located within 250 feet of where guard structures are required along Leisure Town Road. The vernal pool is located approximately 90 feet southwest of the crossing location and the mitigation wetland is located approximately 175 feet southeast. As shown in Photograph POI-2.1 and Photograph POI-2.2 in Attachment A: Representative Photographs, an existing conveyance ditch runs parallel to the eastern side of the road between the roadway and the Preserve and a strip of vegetation spanning several feet is present between the conveyance ditch and the Preserve fence line. The western side Leisure Town Road is heavily vegetated with several feet of dense grasses and is lined by a shallow ditch parallel to the roadway.

The Leisure Town Road crossing location will require the placement of guard structures along the road shoulder during construction. Although no vernal pools or other wetland features are located within the proposed work area, due its proximity to the vernal pool and mitigation wetland within the Preserve, this construction activity was considered to have the potential to impact these features. For example, ground disturbance may increase the potential for erosion and stormwater runoff to transport sediment into these features, resulting in potential impacts to vernal pool species. To ensure such impacts are avoided, non-ground disturbing guard structure methods, such as staging of a line truck along the road shoulder or use of flower pot structures, would be used at this crossing. Furthermore, the local topography would ensure that any loose soil carried by stormwater runoff along the road would drain into an existing roadside ditch and be filtered by the adjacent vegetation. To further ensure that any impacts associated with erosion or sedimentation are avoided, avoidance measures would be implemented, including installation of appropriate erosion control devices around guard structure work areas.

Based on the site-specific conditions and use of non-ground disturbing guard structure methods, the work proposed at this location is not anticipated to result in direct or indirect impacts on vernal pools, mitigation wetlands, or vernal pools species within the Preserve.

POI-3: Unpaved Access Road (to Tower 3)

An existing unpaved access road proposed for use during construction to access Tower 3 is located adjacent to the Preserve (see discussion regarding POI-4 below for an assessment of impacts at Tower 3). Although the majority of the access road does not travel adjacent to the Preserve, the access road bisects the Preserve for approximately 850 feet just east of Leisure Town Road and then continues adjacent to the south side of the Preserve for approximately 750 feet, traveling around the perimeter of a deep depression, away from the Preserve. Representative photographs of this location are provided in Photograph POI-3.1 and Photograph POI-3.2 in Attachment A: Representative Photographs, and the access road is shown in Figure 1: Overview Map.

The portions that bisect and are adjacent to the Preserve are located within 50 feet of mitigation wetlands and vernal pools. Where the access road bisects the Preserve, a vernal pool is located approximately 40 feet north and a mitigation wetland is located approximately 30 feet south. A vegetative buffer spanning between 20 to 30 feet is located between the Preserve and the majority of the access road.

The proposed access road is primarily unpaved and during dry conditions there is potential for fugitive dust to be suspended and transported to nearby wetland and vernal pool areas. Should this occur, it may result in potential direct impacts to these features and vernal pool species inhabiting these features. Because the access road would only be used to access one tower, it would experience very limited use during construction. PG&E proposed measures, such as dampening any loose soils along the access road and limiting vehicle speeds to 15 miles per hour, would also be implemented to suppress and limit fugitive dust, thereby reducing the potential for airborne sediment transport into nearby sensitive features.

Because work at this tower will be limited to the dry season, no rutting or other significant roadway impacts resulting from the use of construction equipment are anticipated. The presence of a relatively wide vegetative buffer along the majority of the access road reduces the potential for sediment transport and, to further ensure impacts are minimized, erosion and sediment control devices would be installed as needed along any section of road that is not separated from the Preserve by a vegetated buffer. As a result, no direct impacts to nearby vernal pool or wetland features or vernal pool species are anticipated.

Use of the existing road would not require any ground disturbance that would result in changes to hydrologic connections or regimes; therefore, no indirect impacts to mitigation wetlands, vernal pools, or vernal pool species are anticipated.

POI-4: Tower 3 Work Area

As shown in Figure 1: Overview Map, Tower 3 is located immediately south of the Preserve boundary and is the only tower within 250 feet of the Preserve that will require ground access during project construction. Modifications will require a construction work area up to 1 acre in size at the base of the tower. At the time of the field reconnaissance, the proposed tower work area had recently been previously plowed or disked, resulting in the exposure of topsoil. Representative photographs of the site are provided in Photograph POI-4.1 and Photograph POI-4.2 in Attachment A: Representative Photographs.

Although Tower 3 is located outside of the Preserve and no vernal pools or other aquatic features are present within the proposed tower work area, a vernal pool complex is located approximately 50 feet north of the work area within the Preserve boundaries. Use of the work area would not require grading or auguring that would further expose topsoil beyond existing conditions. Furthermore, runoff from this area has minimal potential to reach the vernal pool areas, as there is no apparent slope gradient that would direct flow into nearby vernal pools as well as dense vegetation that would help settle site run-off. Because all work at this tower would be conducted during the dry season, the potential for site run-off is very low. To further minimize the potential for erosion, sedimentation, or transport of loose soil particles, erosion control devices will be installed along the north side of the Tower 3 work area adjacent to the Preserve.

Construction activities using heavy equipment in this area may further disturb the topsoil layer and disperse fine-grained dust into the air. However, PG&E's proposed measures would be implemented to dampen any loose soils and suppress fugitive dust, thereby reducing the potential for sediment transport into nearby sensitive features. No direct impacts to vernal pools or vernal pool species are anticipated.

Use of the work area would not require any activities that would result in changes to hydrologic connections or regimes. As a result, no indirect impacts to vernal pools or vernal pool species within the Preserve are anticipated.

CONCLUSION

Based on a review of background data, literature and field reconnaissance, and site-specific construction plans, this memorandum concludes that the project activities as described that are proposed within 250 feet of vernal pool features will not cause disturbance to nearby vernal pool and wetland complexes. No direct or indirect impacts to vernal pools or vernal pool species are anticipated to occur with the implementation of the combined project measures described herein and in associated project permitting documents[2]. On-site application of avoidance measures and planned best management practices for the project, such as

[2] Additional measures are contained within the project's Biological Assessment, Stormwater Pollution Prevention Plan, and Initial Study/Mitigated Negative Declaration.

installation of silt fencing in specified areas and suppression of dust, will ensure that impacts to vernal pool complexes are avoided.

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ATTACHMENT A: REPRESENTATIVE PHOTOGRAPHS

Photograph POI-1.1: Proposed guard structure work area east of I-505 and west of Tower 8 (looking north)

Photograph POI-1.2: Proposed guard structure location adjacent to I-505 and Tower 8 (looking north)

Photograph POI-2.1: Work area adjacent to Leisure Town Road and Tower 5 (looking north)

Photograph POI-2.2: Work area adjacent to Leisure Town Road and Tower 5 (looking northeast)

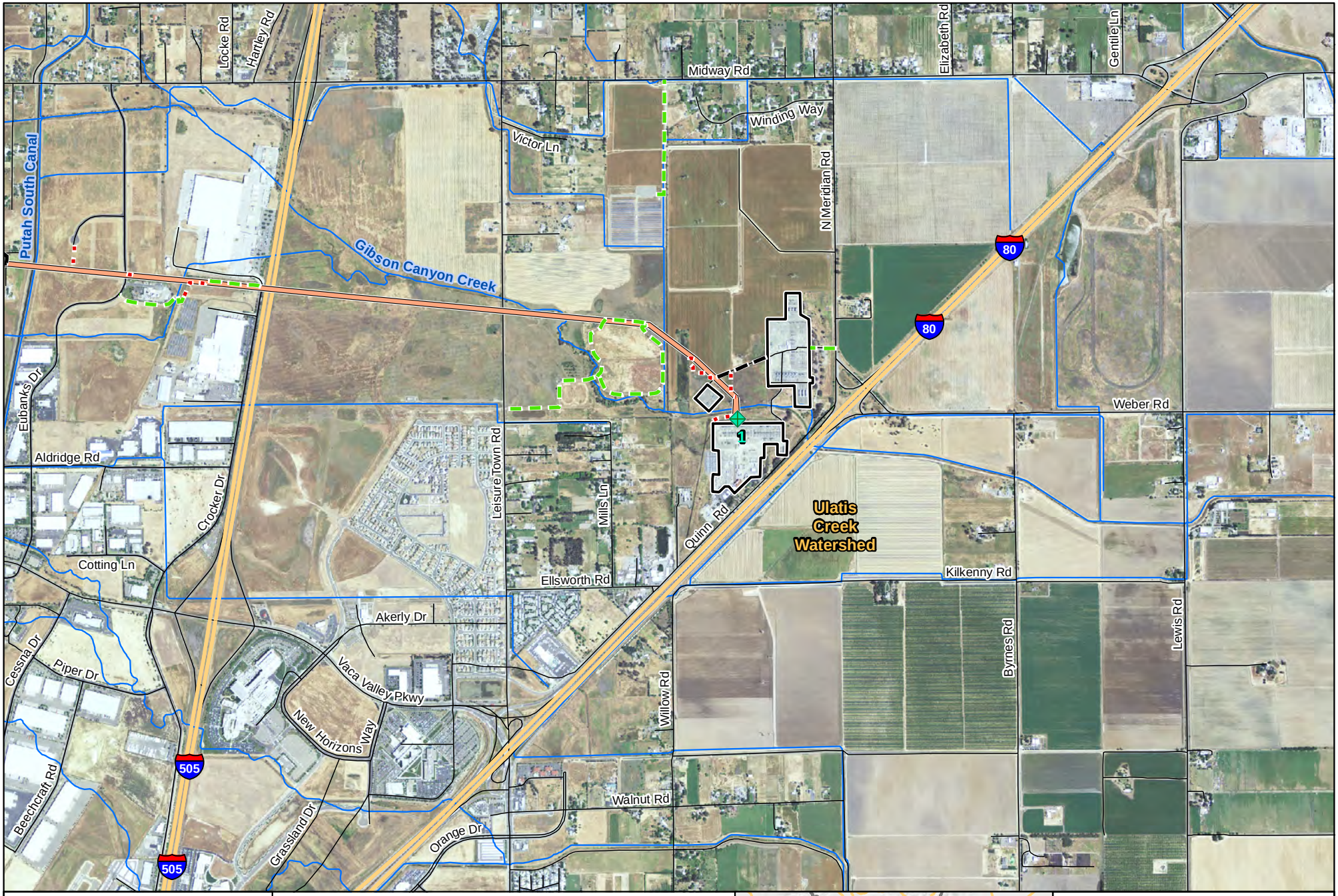
Photograph POI-3.1: Unpaved access road (looking east)

Photograph POI-3.2: Unpaved access road (looking northwest)

Photograph POI-4.1: Work area surrounding Tower 3 (looking east)

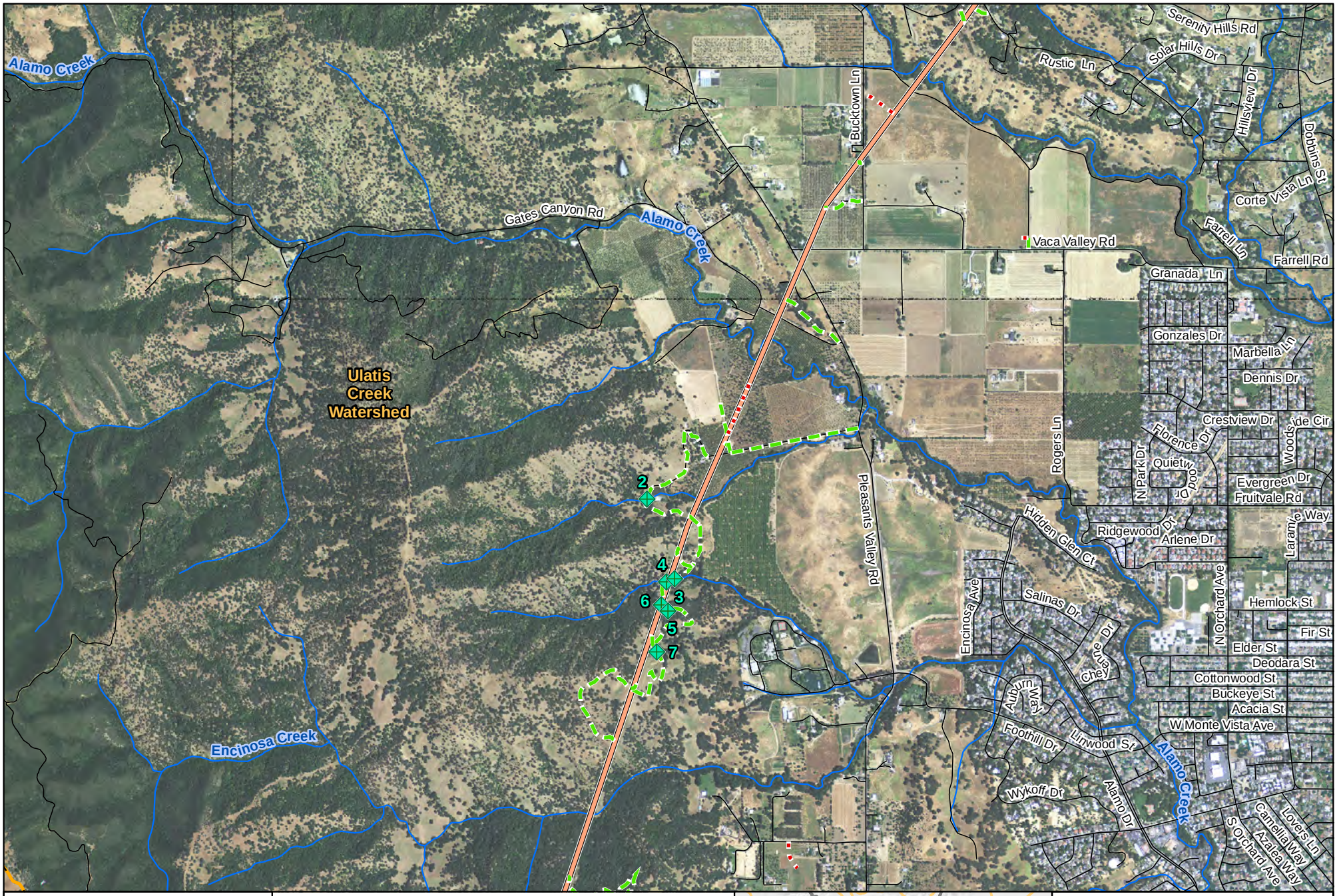
Photograph POI-4.2: Work area surrounding Tower 3 (looking northeast)

ATTACHMENT J:
WATERSHED OVERVIEW MAP



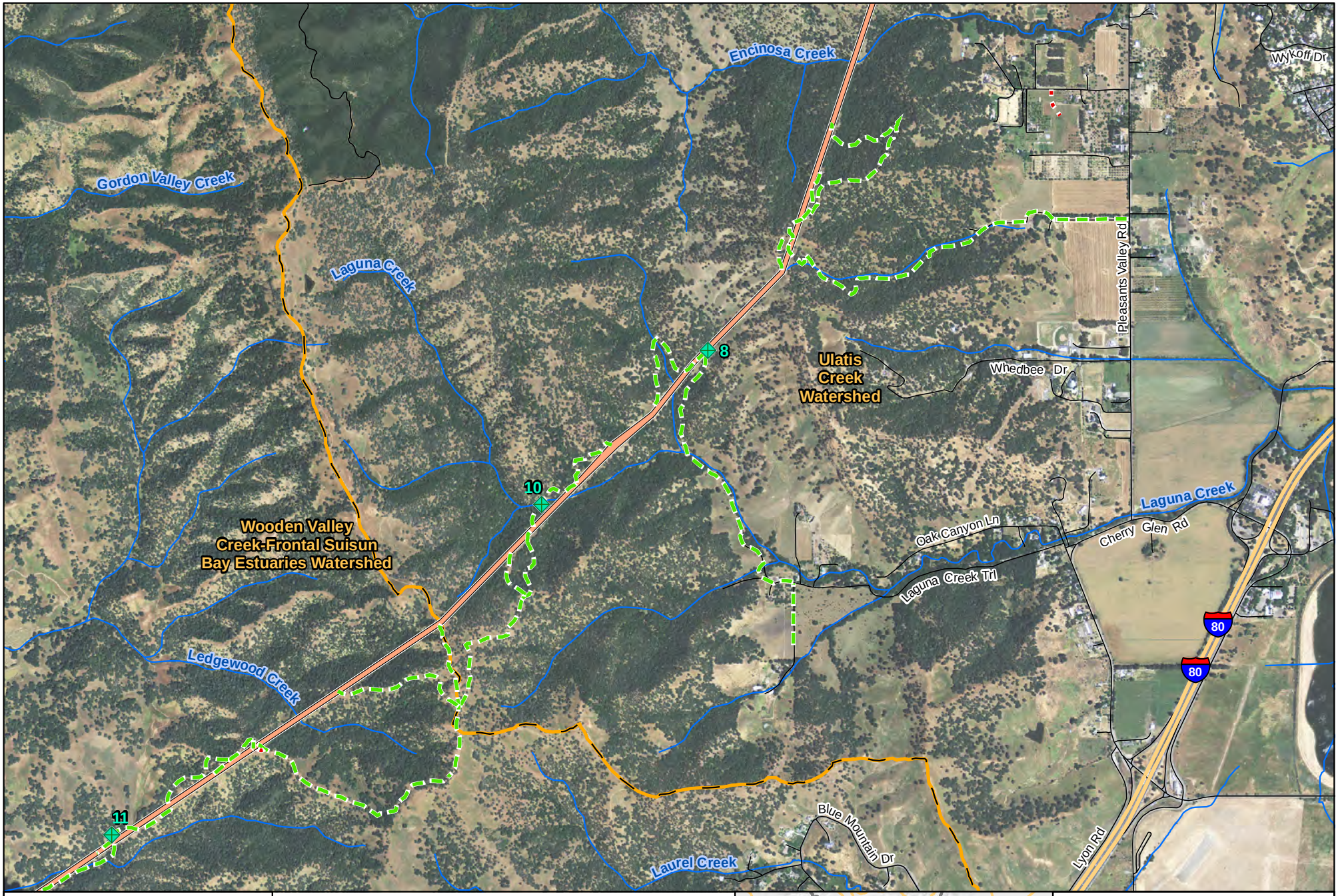
Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment J: Watershed Overview Map



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment J: Watershed Overview Map


Encinosa Creek
Gordon Valley Creek
Laguna Creek
Wyckoff Dr
Pleasants Valley Rd
8
Ulatis Creek Watershed
Whedbee Dr
10
Wooden Valley Creek-Frontal Suisun Bay Estuaries Watershed
Laguna Creek
Oak Canyon Ln
Cherry Glen Rd
Laguna Creek Trl
80
80
Ledgewood Creek
11
Blue Mountain Dr
Laurel Creek
Lyon Rd
0
0.25
0.5
Miles
1:24,000
N
Pacific Gas and Electric Company
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Project Access
Existing Paved Road
Existing Unpaved Road
Overland Route
Crossing Improvement Site
Temporary Guard Structure
Watershed Boundary (HU10)
Source: AECOM 2013; PG&E 2013
Basemap: NAIP 2012
NAPA
SONOMA
SOLANO
Vaca Dixon-Lakeville 230 kV Reconductoring Project
Attachment J: Watershed Overview Map

0 0.25 0.5 Miles

1:24,000

N

Pacific Gas and Electric Company

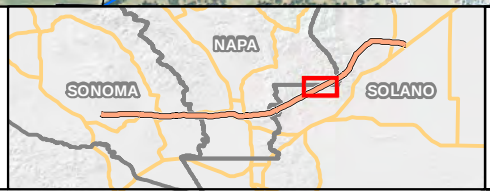
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Project Access

Existing Paved Road
Existing Unpaved Road
Overland Route

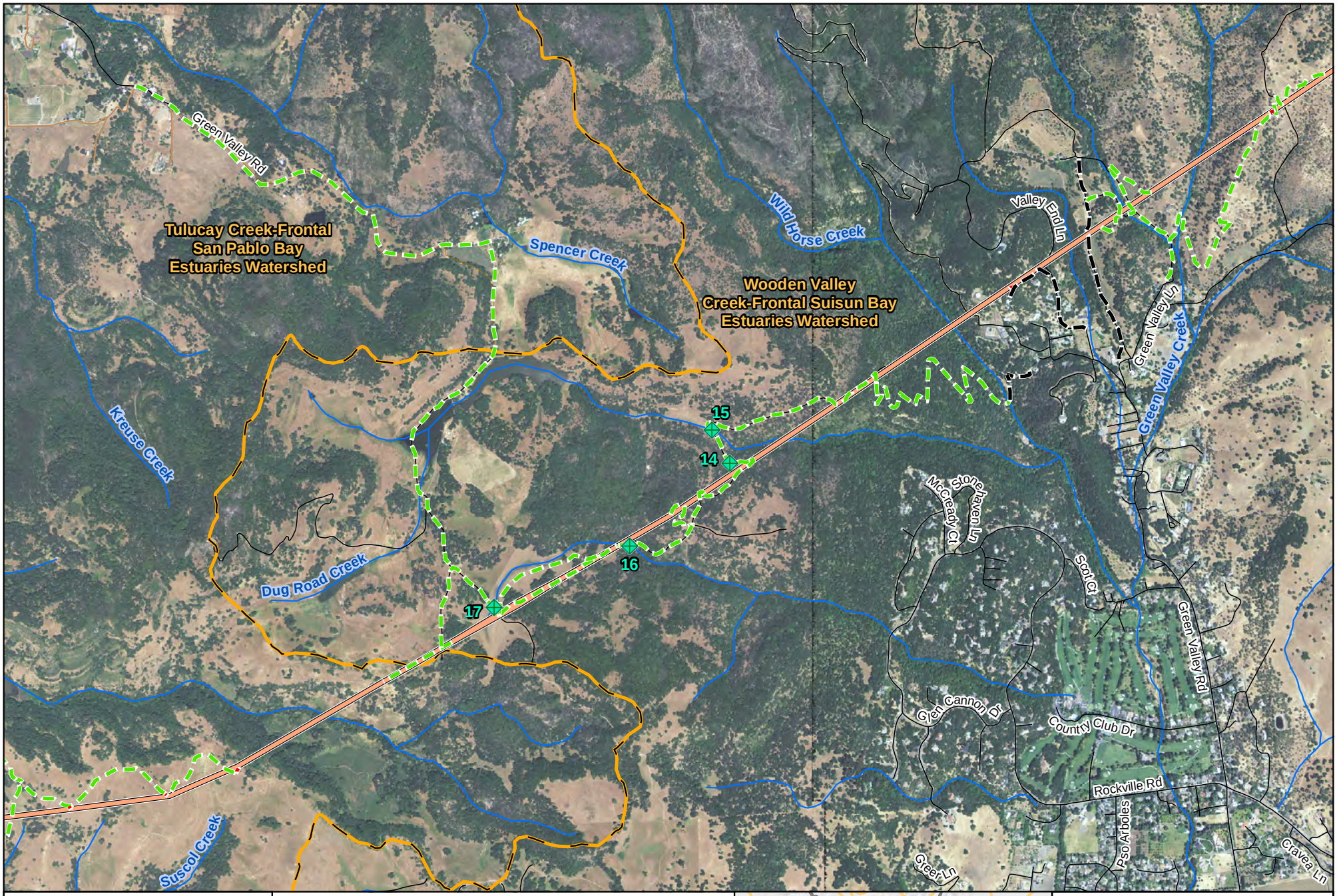
Crossing Improvement Site
Temporary Guard Structure
Watershed Boundary (HU10)

Source: AECOM 2013; PG&E 2013
Basemap: NAIP 2012



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment J: Watershed Overview Map



Miles
0 0.25 0.5

1:24,000

N

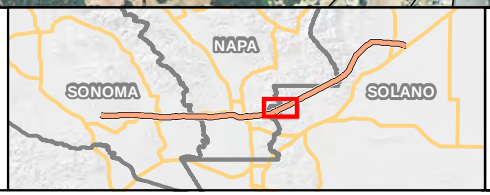
Pacific Gas and Electric Company

- Existing Substation
- Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Project Access

- Existing Paved Road
- Existing Unpaved Road
- Overland Route
- Crossing Improvement Site
- Temporary Guard Structure
- Watershed Boundary (HU10)

Source: AECOM 2013; PG&E 2013
Basemap: NAIP 2012



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment J: Watershed Overview Map

0 0.25 0.5 Miles

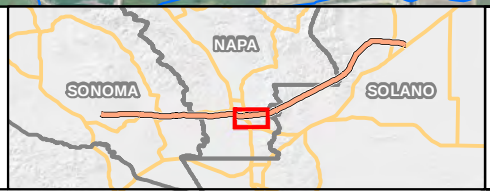
1:24,000

Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Project Access
Existing Paved Road
Existing Unpaved Road
Overland Route

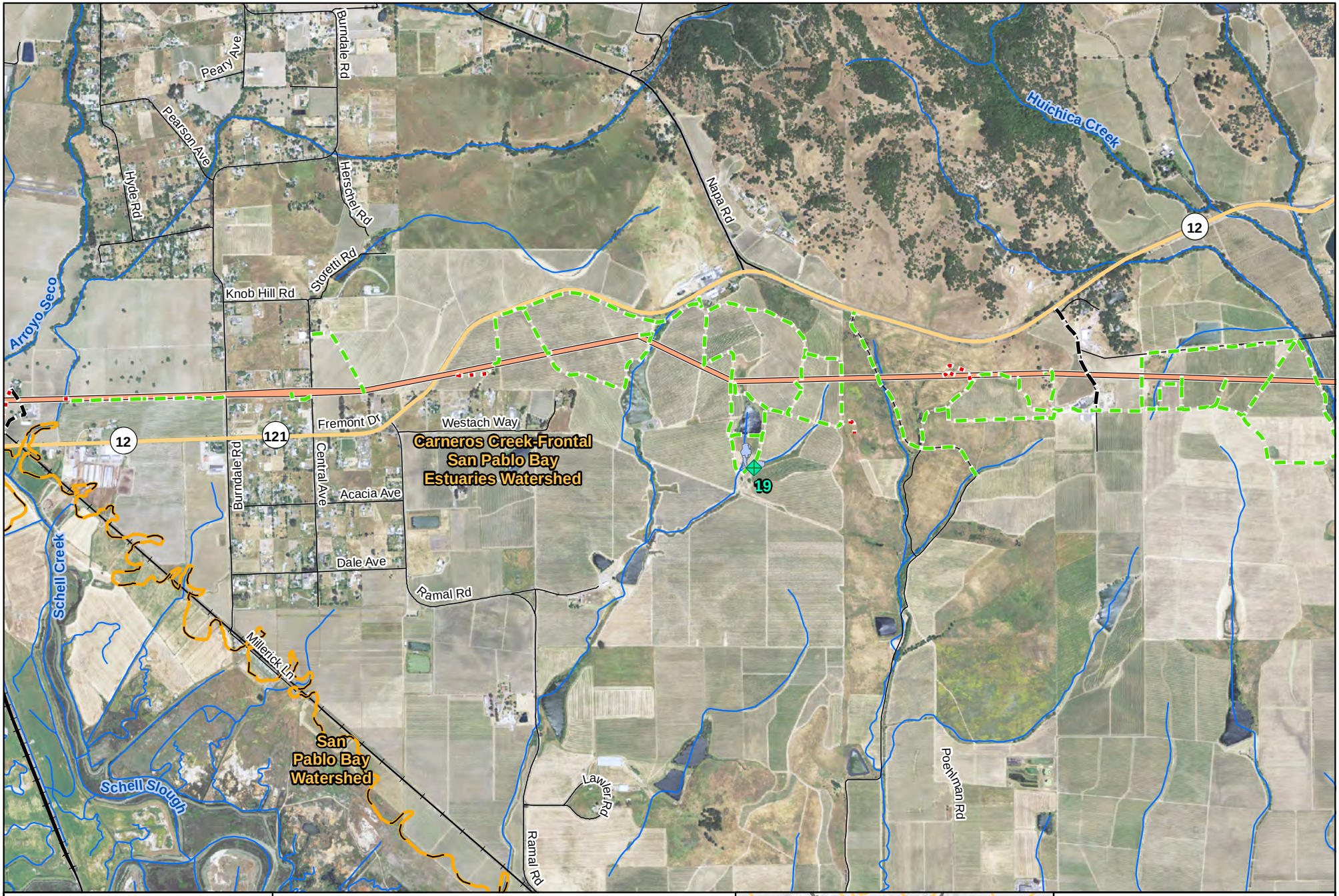
Crossing Improvement Site
Temporary Guard Structure
Watershed Boundary (HU10)

Source: AECOM 2013; PG&E 2013
Basemap: NAIP 2012



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment J: Watershed Overview Map


Peary Ave
Burndale Rd
Pearson Ave
Hyde Rd
Herschel Rd
Napa Rd
Huichica Creek
Arroyo Seco
Knob Hill Rd
Storetti Rd
12
121
Fremont Dr
Westach Way
Carneros Creek-Frontal
San Pablo Bay
Estuaries Watershed
19
Burndale Rd
Central Ave
Acacia Ave
Schell Creek
Dale Ave
Ramal Rd
Millerick Ln
San
Pablo Bay
Watershed
Schell Slough
Lawler Rd
Ramal Rd
Poehlman Rd
0
0.25
0.5
Miles
1:24,000
N
Pacific Gas and Electric Company
Existing Substation
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Project Access
Existing Paved Road
Existing Unpaved Road
Overland Route
Crossing Improvement Site
Temporary Guard Structure
Watershed Boundary (HU10)
Source: AECOM 2013; PG&E 2013
Basemap: NAIP 2012
NAPA
SONOMA
SOLANO
Vaca Dixon-Lakeville 230 kV Reconductoring Project
Attachment J: Watershed Overview Map

0 0.25 0.5 Miles

1:24,000

N

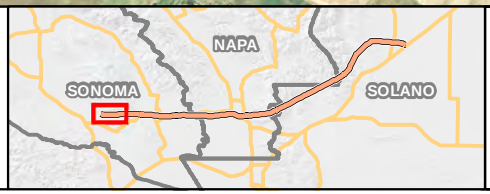
Pacific Gas and Electric Company

- Existing Substation
- Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Project Access

- Existing Paved Road
- Existing Unpaved Road
- Overland Route
- Crossing Improvement Site
- Temporary Guard Structure
- Watershed Boundary (HU10)

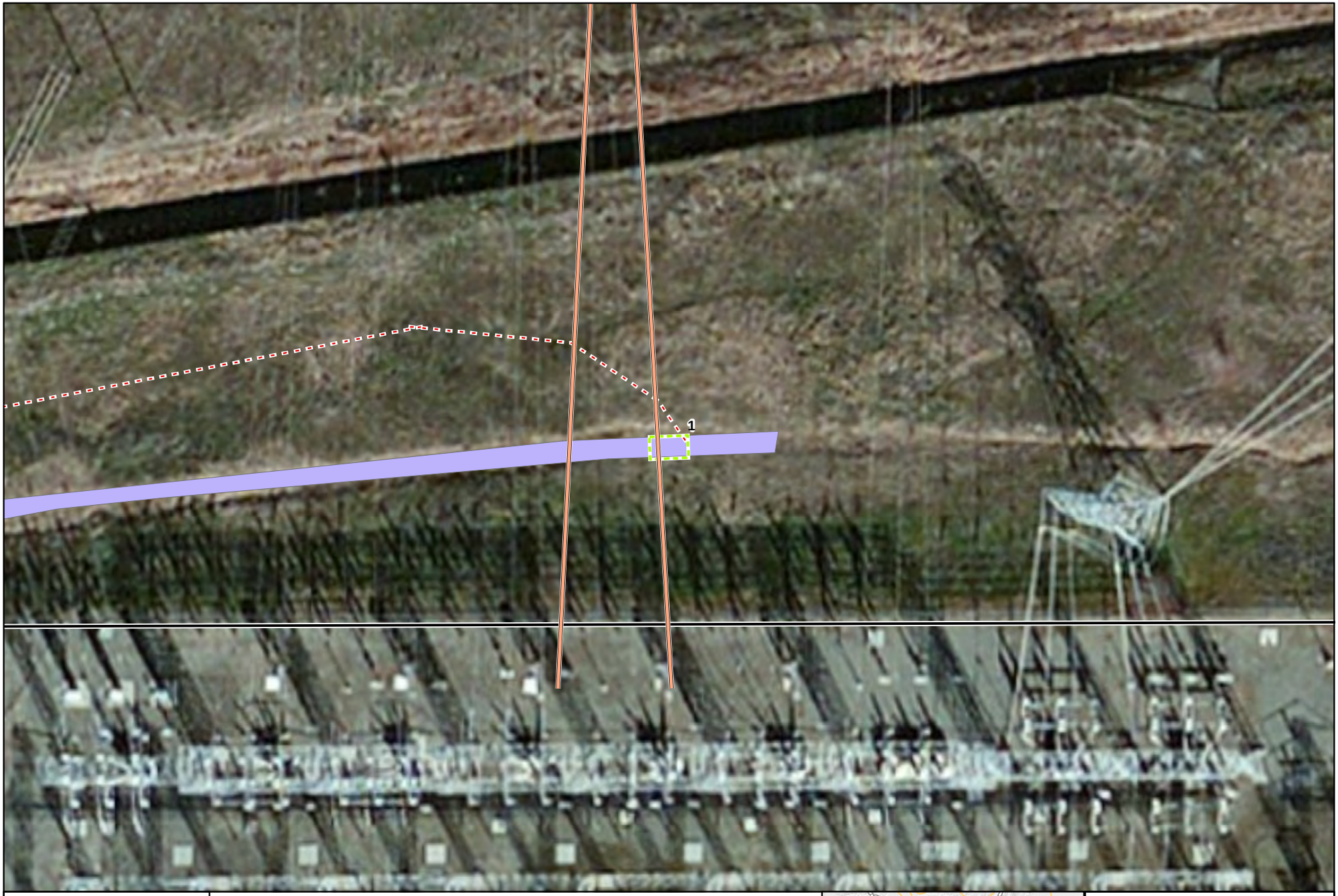
Source: AECOM 2013; PG&E 2013
Basemap: NAIP 2012



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment J: Watershed Overview Map

ATTACHMENT K:
DETAILED WETLAND STREAM IMPACT MAP



0 25 50 Feet

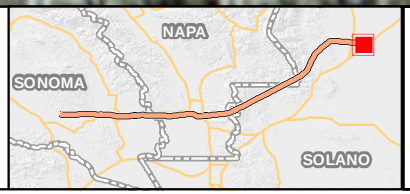
1:600

N

Pacific Gas and Electric Company

Temporary Culvert Installation**
Wetland
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(1 of 20)

Feet
0 25 50

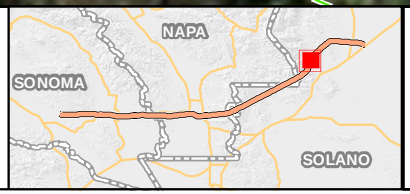
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Wetland
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(2 of 20)

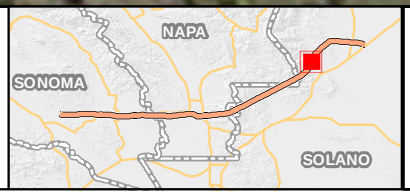
Feet
0 25 50

1:600

Pacific Gas and Electric Company

Existing Culvert Modification**
Culvert Replacement**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(3 of 20)

0 25 50 Feet

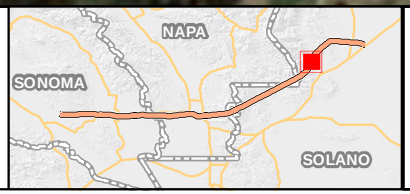
1:600

N

Pacific Gas and Electric Company

Existing Culvert Modification**
Culvert Replacement**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(4 of 20)

Feet
0 25 50

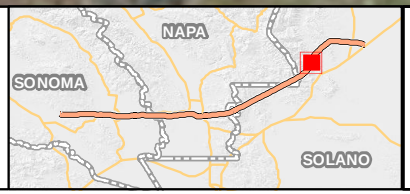
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Fill Placement Over Existing Culvert**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(5 of 20)

Feet
0 25 50

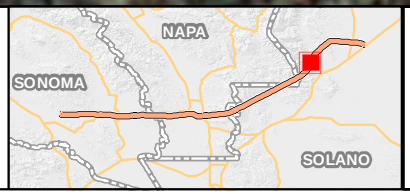
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Fill Placement Over Existing Culvert**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(6 of 20)

Feet
0 25 50

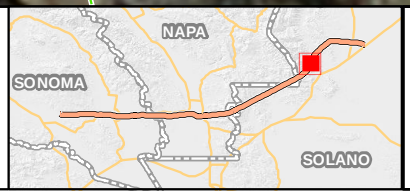
1:600

N

Pacific Gas and Electric Company

Culvert Replacement**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(7 of 20)

0 25 50 Feet

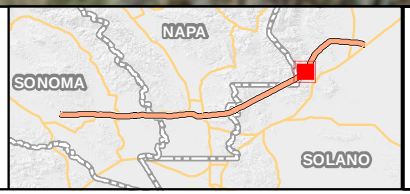
1:600

N

Pacific Gas and Electric Company

Culvert Replacement**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(8 of 20)

Feet
0 25 50

1:600

N

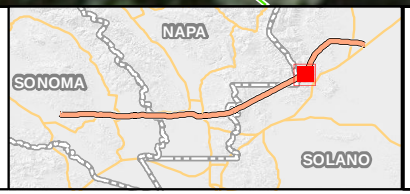
Pacific Gas and Electric Company

Temporary Bridge Crossing**
Intermittent Waters

Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route

Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(9 of 20)

Feet
0 25 50

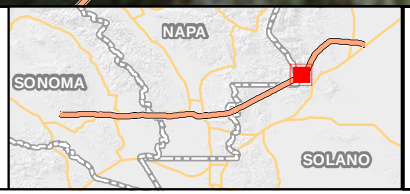
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Perennial Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(10 of 20)

Feet
0 25 50

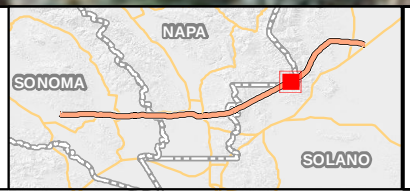
1:600

N

Pacific Gas and Electric Company

Existing Culvert Modification**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(11 of 20)

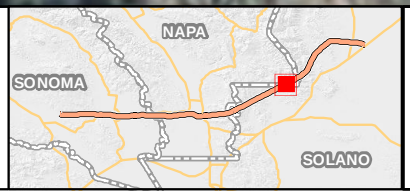
Feet
0 25 50

1:600

Pacific Gas and Electric Company

Culvert Replacement**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(12 of 20)

0 25 50 Feet

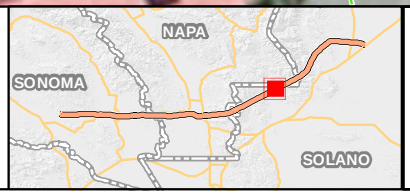
1:600

N

Pacific Gas and Electric Company

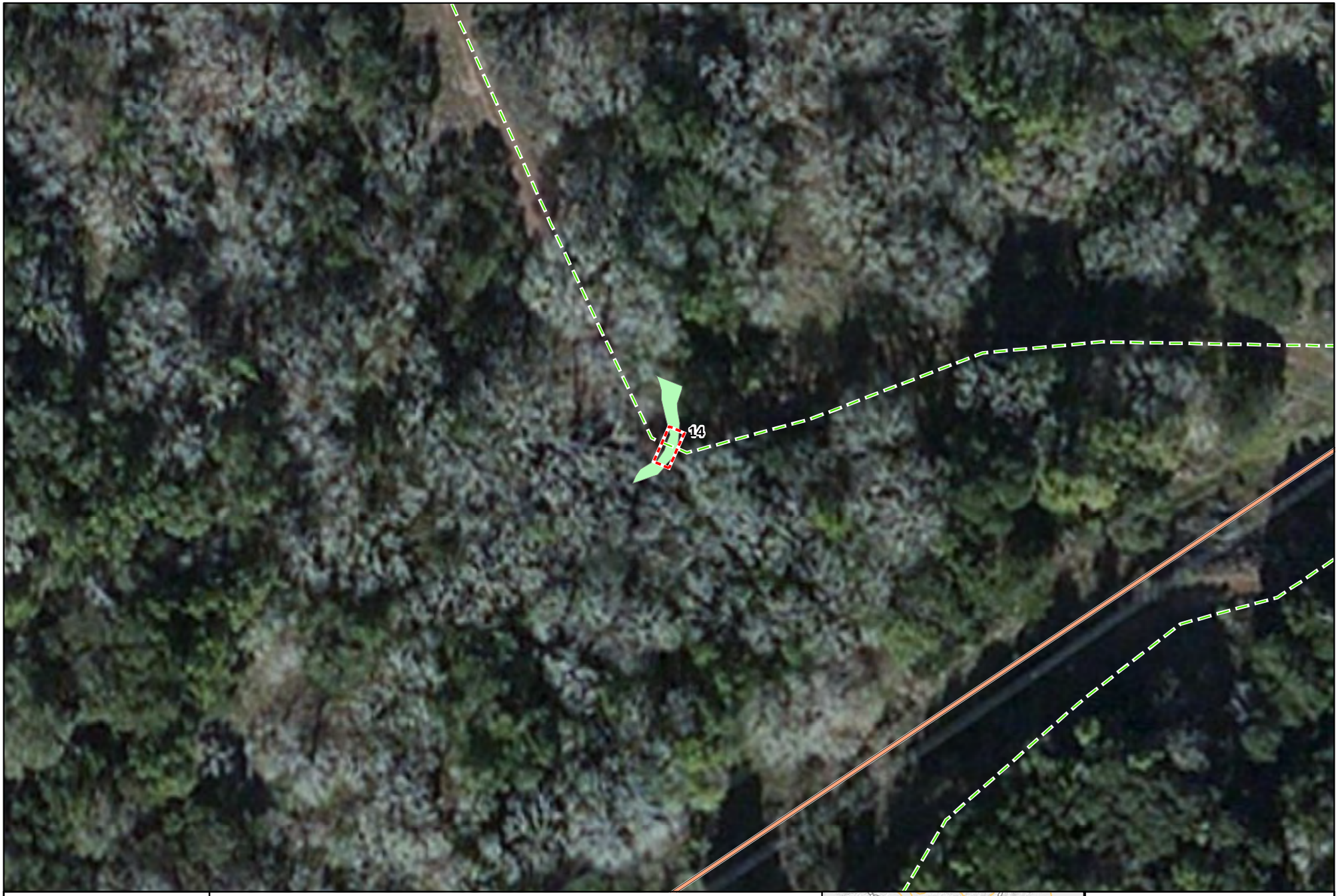
Culvert Installation**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(13 of 20)



Feet
0 25 50

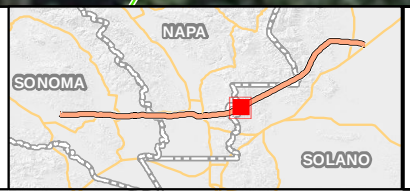
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Intermittent Waters
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(14 of 20)

Feet
0 25 50

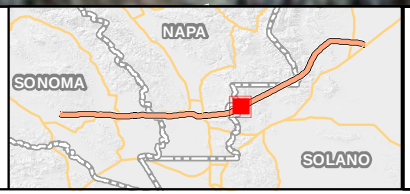
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Wetland
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(15 of 20)

0 25 50 Feet

1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**

Wetland

Existing Steel Lattice Tower

Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Existing Paved Road

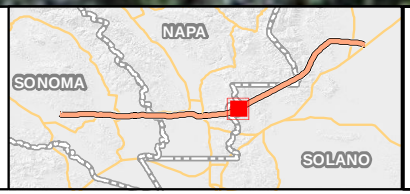
Existing Unpaved Road

Overland Route

Existing Substation

Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(16 of 20)

Feet
0 25 50

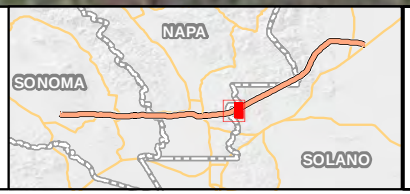
1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**
Wetland/Ephemeral Waters
Temporary Guard Structure**
Existing Steel Lattice Tower
Existing Vaca Dixon-Lakeville 230 kV Transmission Line
Existing Paved Road
Existing Unpaved Road
Overland Route
Existing Substation
Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction
Source: AECOM 2013; PG&E 2013
Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(17 of 20)

0 25 50 Feet

1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**

Ephemeral Waters

Existing Steel Lattice Tower

Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Existing Paved Road

Existing Unpaved Road

Overland Route

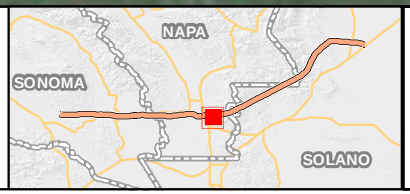
Existing Substation

Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction

Source: AECOM 2013; PG&E 2013

Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(18 of 20)

0 25 50 Feet

1:600

N

Pacific Gas and Electric Company

At-Grade Crossing Construction**

Wetland

Existing Steel Lattice Tower

Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Existing Paved Road

Existing Unpaved Road

Overland Route

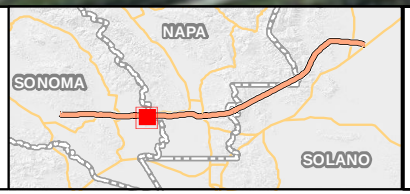
Existing Substation

Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction

Source: AECOM 2013; PG&E 2013

Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(19 of 20)

0 25 50 Feet

1:600

N

Pacific Gas and Electric Company

Temporary Guard Structure Installation**

Wetland/Perennial Waters

Temporary Guard Structure**

Existing Steel Lattice Tower

Existing Vaca Dixon-Lakeville 230 kV Transmission Line

Existing Paved Road

Existing Unpaved Road

Overland Route

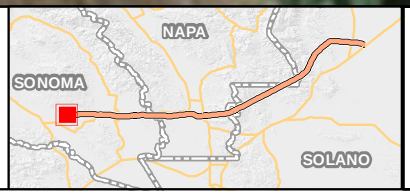
Existing Substation

Temporary Landing Zone**

** = Locations are approimate and may vary depending on site-specific conditions at the time of construction

Source: AECOM 2013; PG&E 2013

Basemap: ESRI 2013



Vaca Dixon-Lakeville 230 kV Reconductoring Project

Attachment K: Detailed Wetland and Stream Impact Map
(20 of 20)